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905013

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

Machias Gravel Pit Site No. 905013
Town of Machias Cattaraugus County

DATE: February 1990

VOLUME I

Prepared for:

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, *Commissioner*

Division of Hazardous Waste Remediation
Michael J. O'Toole, Jr., P.E., *Director*

By:

Lawler, Matusky & Skelly Engineers

Machias Gravel Pit 90 5013

Class 2a – reclass to 2 is in process in Albany. already sent out of Buffalo

Work we might expect to see done:

① Geophysics
② 1 to 3 wells in overburden
③ Possible barrel removal if found with geophysics.
④ Groundwater, surface water & soil sampling

File Y
Y

ENGINEERING INVESTIGATIONS AT
INACTIVE HAZARDOUS WASTE SITES
IN THE STATE OF NEW YORK
PHASE II INVESTIGATIONS

MACHIAS GRAVEL PIT
TOWN OF MACHIAS, CATTARAUGUS COUNTY
NYSDEC I.D. NO. 905013

Prepared for

DIVISION OF HAZARDOUS WASTE REMEDIATION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road
Albany, New York 12233-0001

LMSE-90/0081&576/011

Prepared by

LAWLER, MATUSKY & SKELLY ENGINEERS
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

February 1990

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CHAPTER 1

CHAPTER 1

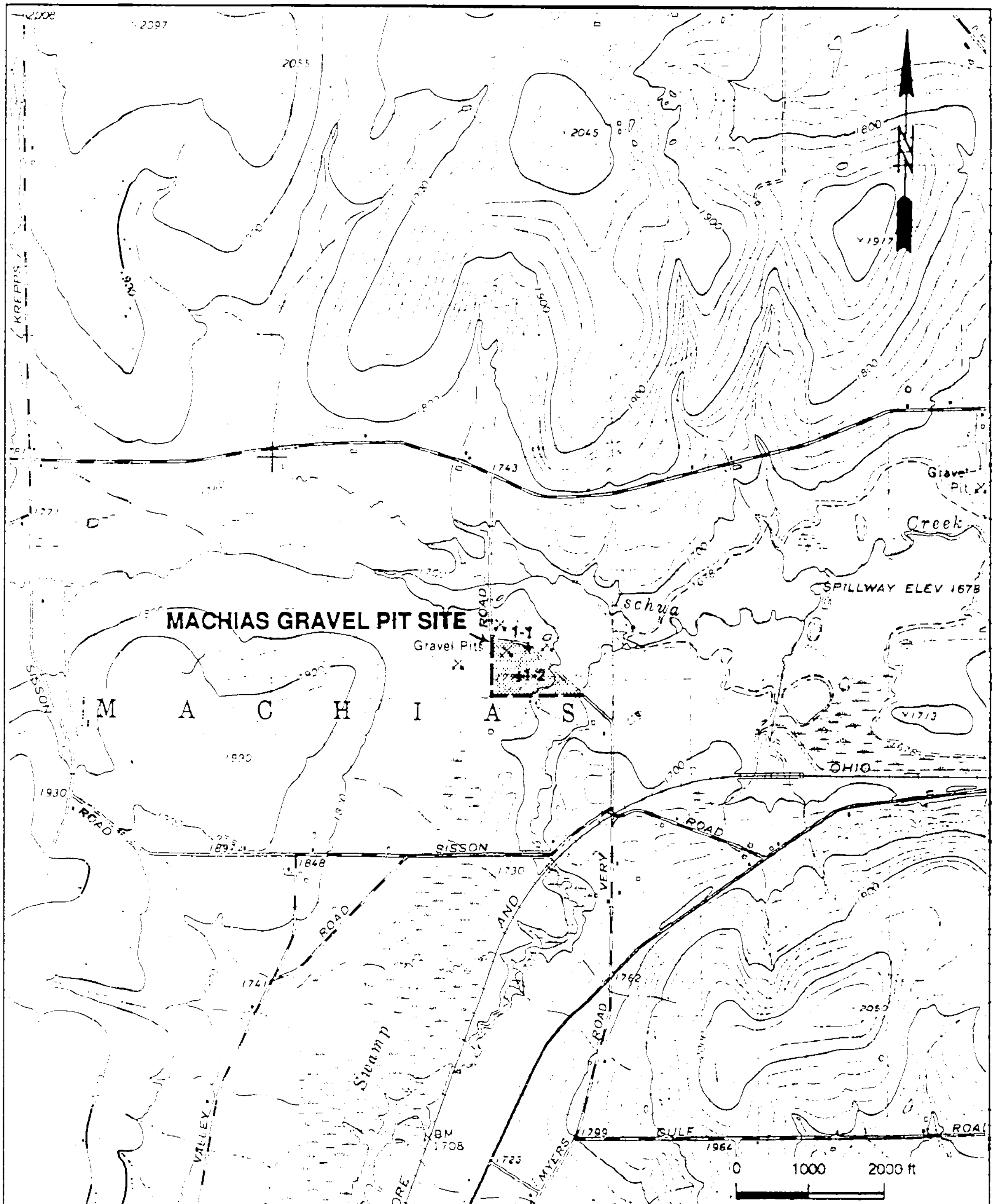
EXECUTIVE SUMMARY

The Machias Gravel Pit site is located in the Town of Machias, Cattaraugus County, New York (Figures 1-1 and 1-2; Photos 1-1 and 1-2). The site is approximately 3.5 acres in size and consists of an active gravel pit operation in the southern portion of the site and an inactive gravel pit area in the northern section. The inactive gravel pit area to the north was used for the disposal of approximately 600 drums of waste material from the Motorola Plant in Arcade, New York, between March and September 1978. The drums were suspected of containing wastes such as epoxy resins, acids, flammable and nonflammable solvents, and cutting oils. It is reported that the contents of approximately half the drums were emptied. The oils received at the site were spread on local roads for dust control by town personnel. The remaining drummed wastes were stacked on the ground surface along the gravel pit wall.

Area residents utilize groundwater as the sole source of potable water. The nearest residence (Cole) is located approximately 500 ft south of the site. At a point prior to 6 October 1986, an activated carbon filtration system was installed on the Cole residence supply system.

Under the direction of the New York State Department of Environmental Conservation (NYSDEC), a Phase II investigation was conducted by Lawler, Matusky & Skelly Engineers (LMS) to address possible soil, surface water, groundwater, and other subsurface contamination from the on-site activities and to determine whether there has been a release to the environment of hazardous waste. This report details the findings of the investigation.

During the investigation, contamination of surface soils of the gravel pit in the area of drum storage was detected. In 1986 and



Lat 42°22'05"N
Long 78°30'7.5"W

Quadrangle Location

Source: USGS Topographic Map West Valley, NY 1964

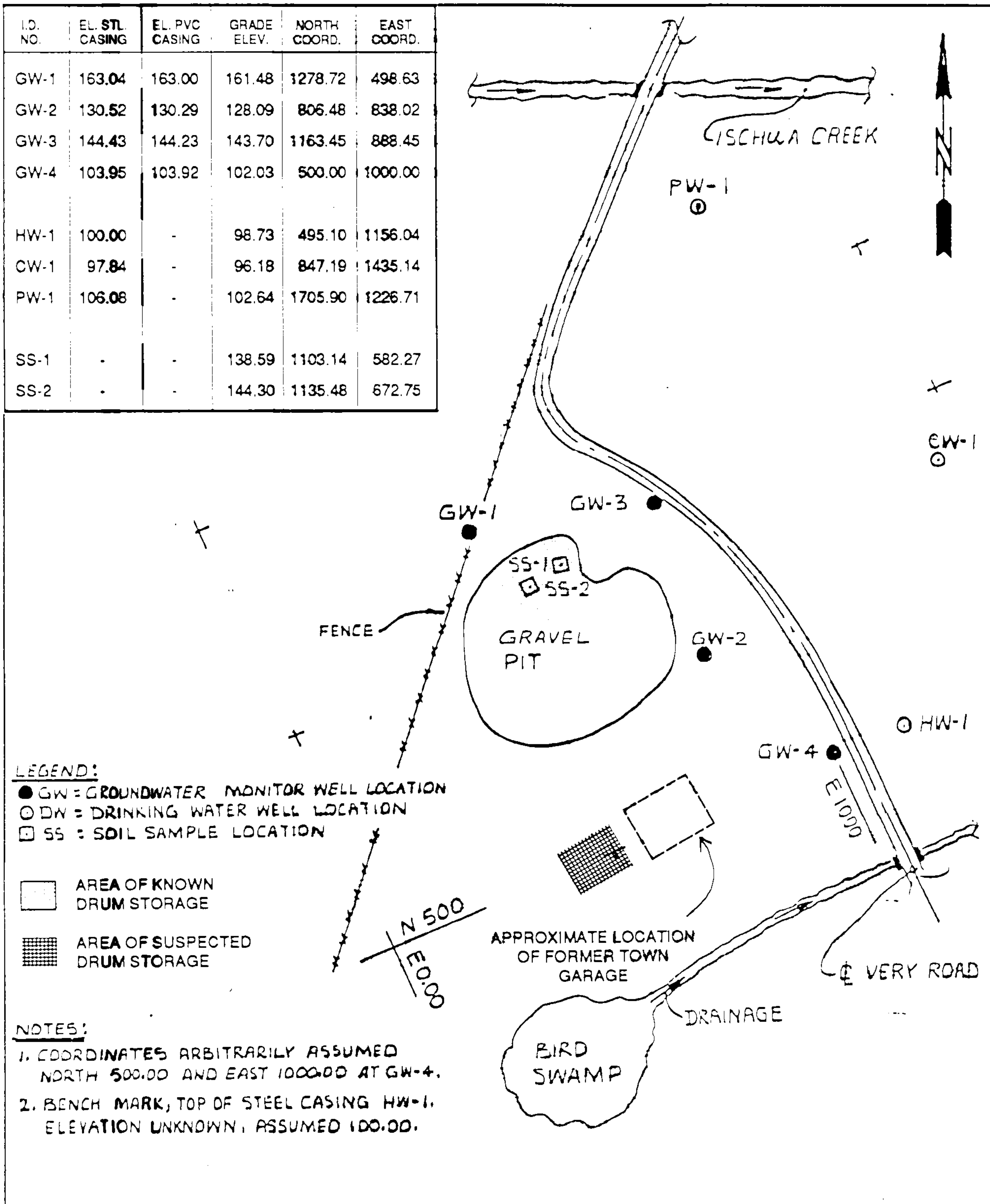
FIGURE 1-1

LOCATION MAP

Machias Gravel Pit
NYSDEC I.D. No. 905013
1988 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

I.D. NO.	EL. STL. CASING	EL. PVC CASING	GRADE ELEV.	NORTH COORD.	EAST COORD.
GW-1	163.04	163.00	161.48	1278.72	498.63
GW-2	130.52	130.29	128.09	806.48	838.02
GW-3	144.43	144.23	143.70	1163.45	888.45
GW-4	103.95	103.92	102.03	500.00	1000.00
HW-1	100.00	-	98.73	495.10	1156.04
CW-1	97.84	-	96.18	847.19	1435.14
PW-1	106.08	-	102.64	1705.90	1226.71
SS-1	-	-	138.59	1103.14	582.27
SS-2	-	-	144.30	1135.48	672.75



1988 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

FIGURE 1-2

LOCATION OF MONITORING WELLS AND SAMPLE POINTS

Machias Gravel Pit
NYSDEC I.D. No. 905013

Source: Edward O. Watts & Associates
Buffalo, 1989

Photo 1-1. View south from Felton Hill Road. Machias Gravel Pit appears as a road cut on Very Road.

Photo 1-2. View east from western edge of Machias Gravel Pit. Cole residence is visible in background.

1987 NYSDEC oversaw a drum removal and soil remediation project on the site. An attempt to clean contaminated soil was made by excavating a small portion from directly beneath the drums and placing it on plastic. A sample of the material on the plastic was collected during the Phase II investigation and found to be moderately contaminated by volatile organics. A sample collected adjacent to the stockpile was found to contain low-level volatiles and moderate semivolatiles. The extent of soil contamination is unknown.

Groundwater samples collected from the four newly installed monitoring wells and three nearby potable supply wells were submitted for analysis. No contaminants were detected in any of the sampled potable supply wells. Moderate volatile contaminants were detected in one downgradient monitoring well, and low-level semivolatile contaminants were detected in three monitoring wells, including the "upgradient" well. A study of the results has raised questions about the exact local water table gradient and what impact the excavation of the gravel pit itself has had on the hydrology of the site. Additional reference points will be necessary for a more accurate discussion of the local groundwater gradient and flow direction.

The data collected in this and previous investigations were used to evaluate the site within the context of the U.S. Environmental Protection Agency (EPA) Hazard Ranking System (HRS), the standard ranking system used by NYSDEC. The HRS assigns numerical values to various aspects of a site and assesses them with respect to their potential for posing a relative risk to the general public and the environment due to the presence of uncontrolled release of hazardous substances. It does not address the feasibility, desirability, or degree of cleanup required, nor does it address all potential environmental or health impacts.

The HRS yields three scores: the potential for migration of hazardous substances from the site (S_M), the potential risk involved with direct contact (S_{DC}), and the potential for fire and explosion (S_{FE}). The migration potential is evaluated through the rating of factors associated with three routing modes: groundwater (S_{GW}), surface water (S_{SW}), and air (S_A). The scored value for each is combined to determine the risk to the environment and/or humans from the potential migration of hazardous substances from the site. The risks involved with direct contact and the potential for fire and explosion are evaluated according to site-specific information, including toxicity of waste, quantity, site demographics, location with respect to sensitive habitats of wildlife, etc.

The HRS score for the Machias Gravel Pit site is as follows:

S_M = 37.16 (S_{GW} = 64.29, S_{SW} = 0.00, S_A = 0.00)

S_{FE} = Not scored

S_{DC} = 12.50

Based on the conclusions of the Phase II investigation, the following activities are recommended:

- Further investigation to delineate the extent and degree of soil contamination and subsequent soil excavation and removal
- Investigation of the area where the grid geophysical survey was conducted to determine whether it is the source of the contamination
- Installation of additional monitoring wells and piezometers to better determine the extent of contamination and better define the water table under the site
- Resurveying and contouring of site

- Continued downgradient monitoring to establish whether contaminant levels are increasing or decreasing

- Institution of a routine maintenance program for the Cole residence's carbon filter to make sure the filter is still actively working

- Classification of the site as a Class 2 hazardous waste site

CHAPTER 2

CHAPTER 2

OBJECTIVES

Lawler, Matusky & Skelly Engineers (LMS), under contract to the New York State Department of Environmental Conservation (NYSDEC), conducted a Phase II investigation of the Machias Gravel Pit, located in the Town of Machias, Cattaraugus County, New York. The investigation was targeted to address specific concerns regarding past waste storage/disposal practices and to provide additional information on the site so that it could be scored accurately on the Hazard Ranking System (HRS). The HRS is the standard ranking system adopted by NYSDEC for state Superfund projects and inactive waste disposal sites.

Specific objectives of Phase II investigations are to:

- Provide a preliminary geological and hydrogeological site assessment, including determination of depth to groundwater and aquifers of concern.
- Identify and evaluate the presence, concentration, and nature of contamination and determine to the extent limited by the scope of work its release (if any) to the environment.
- Using information compiled in the study, determine the significance of any release and the degree to which it may threaten surrounding areas.
- Provide additional information to complete the final HRS score.
- Prepare a report documenting findings and any recommendations for possible future work.

CHAPTER 3

CHAPTER 3

DESCRIPTION OF PHASE II INVESTIGATION

3.1 LITERATURE REVIEW

A review of relevant files maintained by the Cattaraugus County Health Department, RECRA Environmental, Inc. (preparer of the Phase I report and work scope), and NYSDEC was conducted at their respective offices by LMS personnel on 10, 11, 12, and 17 August 1988. This review process updated the Phase I report and reevaluated it for completeness and accuracy. At the same time, confirmation was obtained concerning the access permission received by NYSDEC from the owner of the adjoining property connected with the investigation.

In addition, Underground Utility Locating Service, a state-mandated service that notifies local utilities about subsurface digging and boring that may disrupt their lines, was contacted in compliance with Industrial Code 53. A minimum of two days' advance notice is required by Underground Locaters to notify companies to mark out their lines at the site. Underground Locaters was notified on 30 September 1988.

3.2 SITE INSPECTION

The initial site visit was conducted by LMS personnel on 11 August 1988 to determine and physically designate the tentative locations for drilling and sampling as put forth in the work scope. Soil sampling and test boring/monitoring well locations were marked by stakes driven into the ground and surface water sampling locations were marked by flagging along the streambed. All of the tentative locations were subject to final NYSDEC oversight approval during the field work. Subsequently, as noted in following sections, two groundwater sampling locations were added, two test boring/monitoring wells were relocated and another added, and the surface water sampling locations were eliminated.

Drill rig accessibility was also verified by considering such factors as overhead obstruction, seasonal ground saturation levels, and variation in the site topography.

A potable source of water for drilling and monitoring well installation was identified and secured from the sewage treatment plant in nearby Arcade.

During the site reconnaissance an air monitoring program was conducted using an HNU photoionization detector (PID). This monitoring instrument can detect the presence of many airborne contaminants. Air monitoring levels for upwind and downwind site locations were taken 4-6 ft above the ground (in the zone of breathing). Appendix B contains air monitoring data taken during the site inspection. The results of the reconnaissance are discussed in Section 4.5.1.

The site-specific information gained from the site reconnaissance provided additional data required for preparation of a health and safety plan (HASP) to be used by LMS personnel during the field investigation (Appendix C).

3.3 AIR MONITORING

Ambient air conditions were initially monitored on-site using an HNU PID to determine whether any previously unidentified sources of air contamination were present, and to confirm that the proposed level of personnel respiratory protection was correct. No areas of the site were identified as a source of airborne organic contaminants above measured background levels. Monitoring was performed at or around the proposed sampling points at ground level and within the presumed working space (4 to 6 ft above grade). Appendix B contains the site inspection/air monitoring report from the site inspection. Data gathered from the site inspection and subsequent monitoring were used to complete a final site-specific HASP (Appendix C). Anticipated working conditions dictated Level D protective clothing with latex gloves and rubber boots.

Because the drum inventory indicated the presence of several chemicals for which air purifying respirators (APRs) are not suitable, there was no Level C contingent backup plan for this site. An action level of 0.5 HNU units above background in the breathing zone was designated as the shutdown point at which alternative courses would be discussed. The action level was never surpassed during the field program.

3.4 GEOPHYSICAL SURVEY

Dunn Geoscience Corporation, under subcontract to RECRA Environmental, an LMS subcontractor, completed a resistivity survey across the Machias Gravel Pit on 26 August 1988. A Bison Model 2350 earth resistivity meter was used in the investigation to characterize the site, assess the variations in subsurface conditions with depth, and provide measures of depth to bedrock, groundwater, or native soil.

The resistivity method introduces a current through the ground between two metal stakes or electrodes. Resistance to the current offered by the strata results in a voltage loss. The loss that occurs as the current moves through the subsurface is measured at other electrodes placed between the current electrodes.

The electrodes were configured in the Werner array, which uses four electrodes arranged in a line. The outer pair are the current electrodes, and the inner pair serve as the potential electrodes and measure the current loss. The depth of electrical penetration is governed by the spacing of the electrodes (the larger the separation, the deeper the penetration). As the survey progresses, the electrode spacing is progressively increased to determine the variation in resistivity with depth. Electrode spacings (referred to as "A" spacings) for the Werner array used at the Machias site ranged from 2 to 70 ft.

The center points for each resistivity sounding were staked and flagged and the trend of each electrode array was recorded. The center points of resistivity soundings two and three were located at proposed well locations GW-3 and GW-4, respectively. Because of the absence of permanent structures at the site, the center points of resistivity soundings one and four were not ground-referenced. The results of the geophysical survey are discussed in Chapter 4; the Dunn report containing the raw data is presented in Appendix D.

An additional geophysical survey was conducted on 21 October 1988 by International Exploration Inc. (Intex). The additional work, consisting of a preliminary magnetometer survey of the northwest portion of the site, was conducted at the request of NYSDEC. The objective was to investigate the possibility that drummed wastes were buried in the area.

3.5 GROUNDWATER INVESTIGATION

The groundwater investigation, consisting of the installation of four monitoring wells aimed at providing data pertinent to water chemistry, stratigraphic characterization, and groundwater regime in the area of the gravel pit, was begun on 13 October 1988. American Auger and Ditching Co. Inc., of Central Square, New York, under subcontract to LMS, provided a two-man crew and a Mobile B-57 drilling rig. Two representatives of LMS were present to perform air monitoring, sample collection, and strata logging under NYSDEC oversight. At a minimum, all on-site personnel had completed a 40-hr hazardous materials training course.

An HNU PID was used during the drilling to monitor the breathing zone, gases exiting the borehole, and auger cuttings and to scan recovered split-spoon soil samples. Any deflections of the HNU from background readings were recorded on the boring logs (Appendix E).

In a designated on-site cleaning area the drilling rig, augers, rods, appurtenant equipment, well pipe, and screens were steam-cleaned before the initiation of work and prior to each test boring/monitoring well installation. The split-spoon samplers were steam-cleaned before each use.

3.5.1 General Monitoring Well/Boring Details

Four test borings were advanced into the subsurface to facilitate strata sampling. Monitoring wells were installed using the Mobile drill rig equipped with 4.25-in. inner diameter (I.D.) hollow-stem augers. A split-spoon sampler 2 ft in length with a 2-in. outside diameter (O.D.) was inserted through and driven ahead of the auger to sample the undisturbed strata. Split-spoon samples were taken every 5 ft from the ground surface to the water table, at which point samples were taken continuously for 10 ft.

In accordance with ASTM D-1586 the borehole samples were obtained by driving the split-spoon sampler 24 in. by the impact of a 140-lb hammer over a 30-in. fall. The number of impacts required to achieve each 6 in. of penetration was recorded on the boring logs. Each split-spoon sample recovered was classified by a geologist in the field and entered into the boring log. The samples were placed in precleaned Teflon-lined screw cap glass jars and retained for later laboratory grain-size analysis. Each jar was labeled with the job number, boring number, date, sample number, depth of sample, and length of recovery. Soil boring logs that describe the subsurface materials encountered were maintained by an LMS on-site geologist and are provided in Appendix E. The monitoring wells installed in each of the four borings were constructed of sections of 10-ft-long, 2-in. I.D. threaded flush-jointed PVC riser casing and 0.010-in. slotted screen. After drilling to the appropriate depth, the borehole was cleaned of cuttings and the constructed monitoring well was lowered into the borehole. The top of the screened interval was set approximately 1 ft above the encountered water-bearing strata to ensure that any lighter-than-water contaminants present would enter the monitoring well. All well materials were installed into the borehole through the hollow-stem augers in a manner consistent with accepted NYSDEC monitoring well installation practices.

Each installation included a washed and graded No. 2 quartz sand pack surrounding the screen and extending from approximately 1 ft below the bottom of the screen to approximately 2 ft above the top. A 2- to 4-ft-thick bentonite seal was placed into the annulus above the sand pack. Potable water was used to saturate the bentonite and the seal was given sufficient time to allow complete swelling. The remaining annulus from the top of the bentonite to within 2 to 3 ft of original grade was filled with a bentonite/cement grout slurry. A 4-in.-diameter steel protective casing with locking cap was placed on each well to prevent unauthorized access and provide protection. Concrete was added into the annulus from the top of the slurry, around the protective casing up to grade, and then was mounded around the casing to divert drainage and prevent any ponding. Monitoring well completion logs for each well are included in Appendix F.

3.5.2 Individual Boring/Well Descriptions

3.5.2.1 Test Boring/Monitoring Well GW-1. GW-1 is located 300 ft west of Very Road and less than 50 ft from the northern edge of the gravel pit (Figure 1-2). The land to the north and west of the gravel pit is owned by Alfred Shenk of West Valley Road, Machias. Permission to install the well was granted by Mr. Shenk prior to the start of the investigation. The location of GW-1 was chosen based upon the northwest- to southeast-trending water table believed to exist in the area of the gravel pit. As GW-1 is upgradient of the area of concern, it would yield samples representative of the natural chemistry of the groundwater entering the subsurface beneath the site. The groundwater chemical analysis at GW-1 could then be used as a basis of comparison for the detection of groundwater contamination at downgradient locations.

In addition, the water table elevation determined at GW-1 could be used in conjunction with similar data from the other three installed monitoring wells and nearby water supply wells to confirm and document the direction of groundwater flow beneath the site.

Test boring at GW-1 began on 13 October 1988. Split-spoon samples were taken at 5-ft intervals by advancing hollow-stem augers to 64 ft, at which point the water table was encountered. Continuous split-spoon samples were taken from 64 to 74 ft. Saturated strata ranging from fine silty sand to coarse sand and gravel were encountered in this interval. Each split spoon, as well as the open borehole, was monitored for the presence of volatile organic compounds (VOCs). No indication of VOCs was revealed from the HNU scans.

After the hole was flushed clean, an overburden monitoring well was installed. The slotted screen was set from 73 to 63 ft. The sandpack was emplaced from the bottom of the borehole to 61 ft, 2 ft above the screen top. A 2-ft seal of bentonite slurry was pumped via a tremie pipe on top of the sand to 59 ft. The remaining annulus was filled with a bentonite/cement grout to within 3 ft of the ground surface. A protective locking steel casing was placed over the capped riser pipe, and concrete was poured into the borehole up to grade.

3.5.2.2 Test Boring/Monitoring Well GW-2. GW-2 is located 100 ft west of Very Road and approximately 30 ft east of the gravel pit. After consultation with NYSDEC personnel, this location was chosen over the GW-2 placement recommended in the work plan. The selected site was favorable because it facilitated the acquisition of a groundwater sample from downgradient of the suspected drum storage area and in line with the downgradient water supply well (DW-1) found to have chloroform contamination. Chemical analysis of a sample from GW-2 could then be compared with the results of a sample from GW-1 to determine contaminants entering the groundwater through the subsurface at the gravel pit, in line with off-site water supply wells.

Test boring at GW-2 began on 17 October 1988. Split-spoon samples were taken at 5-ft intervals by advancing hollow-stem augers to 34 ft, at which point the water table was encountered. Continuous split-spoon samples were taken from 34 to 44 ft. The saturated strata encountered in this interval consisted of a brown fine to coarse sand. No indications of VOCs were revealed through HNU scans of the split-spoon samples and open borehole.

After the hole was flushed clean, an overburden monitoring well was installed. The slotted well screen was set from 41 to 31 ft. The sand pack was emplaced through the augers to 29 ft, 2 ft above the top of the screen. A seal of 2 ft of bentonite pellets followed by 2 ft of tremied bentonite slurry was placed into the borehole annulus above the sand pack. The remaining annulus was then filled with a bentonite cement grout to within 3 ft of the ground surface. A protective locking steel casing was placed over the capped riser pipe, and concrete was poured into the borehole up to grade.

3.5.2.3 Test Boring/Monitoring Well GW-4. GW-4 is located less than 20 ft west of Very Road and approximately 270 ft southeast of the gravel pit. This location, situated roughly as proposed in the work scope, is downgradient of an old garage believed to have been used by the town as a drum staging and loading area for the trucks that oiled the town's dirt roads.

Test boring at GW-4 began on 18 October 1988. Split-spoon samples were taken at 5-ft intervals by advancing hollow-stem augers to 19 ft, at which point continuous samples were taken from 19 to 29 ft. The saturated strata encountered in this interval consisted of coarse sand and gravel that graded into compact gray clay over the last 4 ft. No signs of VOCs were revealed through HNU scans of the split-spoon samples and open borehole.

After the hole was flushed clean, an overburden monitoring well was installed. The slotted well screen was set from 27 to 17 ft. The sand pack was emplaced through the augers to 15 ft, 2 ft above the top of the screen. A seal of 2 ft of bentonite pellets followed by 2 ft of tremied bentonite slurry was placed into the borehole annulus above the sand pack. The remaining annulus was then filled with a bentonite cement grout to within 3 ft of the ground surface. A protective steel locking casing was placed over the capped riser pipe, and concrete was poured into the borehole up to grade.

3.5.2.4 Test Boring/Monitoring Well GW-3. GW-3 is located less than 20 ft west of Very Road and approximately 120 ft east of the gravel pit. This location was also changed from the one proposed in the work plan. The current site is downgradient from another area of suspected drum storage.

Test boring at GW-3 began on 19 October 1988. Split-spoon samples were taken at 5-ft intervals by advancing hollow-stem augers to 49 ft, at which point the water table was encountered. Continuous split-spoon samples were taken from 49 to 59 ft. The saturated strata encountered in this interval consisted of a fine sandy silt. No signs of VOCs were revealed through HNU scans of the split-spoon samples and of the open borehole.

After the hole was flushed, an overburden monitoring well was installed. The slotted well screen was set from 59 to 49 ft. The sand pack was emplaced through the augers to 47 ft, 2 ft above the top of the screen. A seal of 2 ft of bentonite slurry was placed into the borehole annulus above the sand pack. The remaining annulus was then filled with a bentonite/cement grout to within 3 ft of grade. A protective locking steel casing was placed over the capped riser pipe, and concrete was poured into the borehole up to grade.

3.5.3 Monitoring Well Development

Following completion of the monitoring well installations, all the wells were initially developed using one of two methods, the choice being determined by water table depth.

The first method for use on wells with static water levels no greater than 20 ft involves using a Homelite centrifugal pump with dedicated polyethylene tubing and a PVC foot valve. The foot valve is used to prevent water (which may have contacted the internal components of the pump head) from traveling back down the well (should suction be lost) and also to increase turbidity when surged. Wells are alternately surged and pumped to free fine-grained material from the sides of the borehole and then remove it from the well altogether. This development process is continued until sufficient particulate matter is removed to lower the turbidity values within the well to below acceptable limits for sampling. In this case the upper acceptable value is 50 nephelometric units (NTU). Development may be discontinued after 4 hrs total time if subsurface materials prevent acceptable levels from being obtained, either because of a lack of water-producing zones within the screened area or because the existence of a large column of mobile, fine-grained material makes adequate clearing of the well impractical.

The second development method, used on wells with static water levels greater than 20 ft, has been called the "airlift" method. The Moyno water/grout pump on the drill rig is used to pump a stream of compressed air down the well casing. The air is pumped to the well bottom through a decontaminated 1-in. tremie pipe. The air, being in such a confined space, displaces the water upward until the column is forced high enough to equalize the pressure. When the air pressure can no longer hold up the water column, it passes through the column of water and the uplifted water drops back down the well casing. Upon impact with the bottom of the well casing, the increase in pressure jets water through the well screen and into the surrounding sand pack. This in turn agitates and further settles the sand pack. It also helps to remove deposited material from the borehole. Following several minutes of this surging, a small volume of potable water is pumped down the well to displace the silted water in the well. This process is repeated until water ejected by the well is below the 50 NTU limit.

Well development at GW-4 began on 20 October 1988. The centrifugal pump was used because of the relatively shallow water table. Initial pumping rates of 0.3 gpm increasing to 0.4 to 0.5 gpm were noted, followed by a decrease back to 0.3 gpm. Pumping was continued on GW-4 just in excess of the 4-hr maximum. The low yield was believed to have been caused by clay, which was encountered in the bottom of the boring and may have smeared the borehole during the boring. It is unlikely that well development with the centrifugal pump could clear the clay from the borehole walls as it does not create the jetting action that the airlift method does. Turbidity was measured at over 1000 NTU following development as no appreciable volume was removed from the well because of its poor yield.

Shortly after attempting to develop GW-2 it was noted that the steel protective casing had shifted, which caused the upper section of PVC to fracture. This upper portion of the well was then excavated by hand and the PVC was repaired using a slip coupling. The steel protective casing was then recemented into place. GW-2 was initially developed using the airlift method to remove excess silt. The Teflon bladder pump was used to complete well development. Using a pumping rate of 2 gpm, turbidity was lowered to 30 NTU.

GW-1 contained almost 2 ft of silt at the well bottom. The silt was removed quickly by the airlift method and the bladder pump was then used to complete development at a rate of 0.2 gpm. The final turbidity value was 50 NTU.

GW-3 was airlifted in the same fashion; however, following alternating sequences of surging and washing, no gain in water clarity was noted within the 4-hr period since turbidity values could only be lowered to 350 NTU. This particular well may have needed a finer grained sand pack with a correspondingly smaller slot screen to restrict the influx of fines.

3.5.4 Groundwater Sampling

The newly installed monitoring system was sampled along with two existing cased water supply wells between 26 and 28 October 1988. Proposed sampling points included the four newly installed monitoring wells screened in the upper saturated zone and two deeper cased potable water supply wells a short distance from the gravel pit.

Well purging methods used included a gasoline-powered centrifugal pump with dedicated polyethylene tubing for each well and a compressed air-powered Teflon bladder pump. The centrifugal pump was used in wells with a static water level of less than 19 ft from the surface; the bladder pump was used in all wells with a depth to static water greater than 19 ft. The Cole residential well (CW-1) was purged from the tap, and the abandoned potable well (PW-1) was purged with the centrifugal pump.

General sampling procedures included an initial top of static water level measurement followed by a bottom of well measurement. The volume of water to be purged was calculated based on the diameter of the borehole and the height of the water column. Based on the static water table depth, a decision was made as to which pump would be utilized and purging was initiated. Water was first purged from the bottom of the well to remove accumulated silt from the casing. Pumping rates were adjusted to maintain a steady recovery and pumping volume. When a steady state was reached and any silt had been removed from the bottom of the well, the pump was raised to within a foot or two of the top of the steady water column. Turbidity was measured along with specific conductance, temperature, and pH at measured intervals using calibrated instruments. Periodically the pump was surged to remove additional silt trapped in the sand pack.

When an adequate volume of well water was removed, a dedicated Teflon bailer and nylon rope were used to extract a sample for turbidity analysis. When deemed acceptable by turbidity standards, samples for chemical analysis were retrieved by bailer. The sample from CW-1 was collected directly from the tap. Water samples to be analyzed for Target Compound List (TCL) organics were placed in 40-ml Teflon septa vials. Acid/base/neutral and pesticide/PCB samples were placed in three separate 1-liter glass jars. Total metals and cyanide samples were placed individually into two separate 5-liter plastic containers. Each metals sample was preserved in the field with nitric acid; cyanide samples were similarly preserved with sodium hydroxide. All sample containers were then packed with ice in a sealed shipping cooler with the proper chain-of-custody forms.

Samples collected from the monitoring wells in October 1988 and analyzed by RECRA Environmental were found to be unacceptable by Nytest Environmental Inc. (Nytest), which performed the quality assurance/quality control (QA/QC) review of the data package. The QA/QC report may be found in Appendix G.

3.5.4.1 May 1989 Resampling. Resampling of the monitoring wells was performed between 24 and 30 May 1989. Sample analysis was performed by CompuChem Laboratories of North Carolina. Monitoring wells 1, 2, 3, and 4 were resampled as well as PW-1 (the potable well located in the field across Very Road from the gravel pit) and CW-1 (the cabin well located on the Cole property). In addition to the wells originally sampled, the Cole's personal potable supply was sampled (HW-1). The sample was collected from the tap located in the garage adjacent to their home. The tap precedes the treatment system emplaced for the household supply.

Before sampling, either the centrifugal or the bladder pump was used to purge each well of five borehole volumes of water. Wells

GW-1 and GW-4 were exceptions. Because of low well yields, each was pumped dry once with the bladder pump, then hand bailed to dryness and allowed to recover a second time before sampling. Monitoring of the well-water temperature, pH, specific conductance, and turbidity was performed through the purging and sampling of each well. Table 3-1 contains all chemistry data from each well; the well sampling logs are included in Appendix H. Resampling data results are referenced with an "R." For example, GW-1 becomes GWR-1.

3.5.5 Permeability Testing

LMS geologists performed permeability testing of upper nonconsolidated aquifer materials on 28 October 1988. Recently installed overburden monitoring wells were slug tested and the data generated were used to calculate average hydraulic conductivities.

The slug test technique involves measuring the rate of recharge within the saturated zone following the insertion of a constant volume slug with its associated instantaneous head rise. Response within the upper consolidated zone was also measured after the slug was removed and sufficient time had elapsed for the fallen head to recover to the original static water level. Change in water level is measured over time, and the time required for the water level to stabilize is a function of the rate of flow of groundwater through the aquifer sediments. The hydraulic conductivity was calculated using the method presented in Cedergren (Ref. 1, Appendix A), discussed in Chapter 4.

3.5.6 Surface Soil Sampling

Soil samples were collected for chemical analyses at two sites within the gravel pit. The sampling locations were altered from those proposed in the original scope of work. The final locations,

TABLE 3-1

MACHIAS SAMPLING CHEMISTRIES

Machias Gravel Pit NYSDEC I.D. No. 905013

WELL	VOLUME PURGED (gal)	TEMPERATURE (°C)	pH (units)	SPECIFIC CONDUCTIVITY (umhos/cm)	TURBIDITY (NTU)
HW-1	1	9.6	7.3	657	1.0
	50	9.9	7.3	657	0.7
	125	9.8	7.5	656	0.4
	Sample	10.0	7.3	643	0.65
CWR-1	1	8.2	7.8	363	12
	84	9.0	7.8	355	20
	209	9.1	8.0	352	12
	241	9.2	8.0	359	0.75
	Sample	9.1	8.1	360	0.81
PWR-1	2	8.9	7.8	196	37
	90	9.8	7.8	241	21
	140	10.0	7.9	247	170
	190	10.0	7.9	247	140
	300	10.1	8.0	248	95
	350	10.2	8.1	248	95
	475	10.1	8.1	249	70
	Sample	7.6	8.0	218	16
GWR-1	2	9.9	7.5	581	96
	11	8.3	7.4	557	57
	Sample	9.0	7.4	589	150
GWR-2	3	11	8.1	440	190
	13	10.5	8.0	443	95
	46	10.4	7.9	420	120
	100	10.2	8.0	411	6.6
	115	10.0	7.7	408	5.7
	Sample	7.9	7.9	422	150
GWR-3	1	12.9	7.4	642	88
	8	11.2	7.4	656	39
	18	12.7	7.3	656	80
	38	12.9	7.3	658	15
	60	12.9	7.2	657	4
	96	11.3	7.2	643	3.5
	103	10.7	7.1	668	3
	Sample	10.1	7.3	650	40
GWR-4	1	6.9	7.6	473	140
	9	7.9	7.5	472	92
	11	8.1	7.8	487	260
	Sample	8.4	7.6	478	93

agreed upon by NYSDEC and LMS personnel, are as they appear on Figure 1-2. Sample SS-1 was collected from material that had been mounded on plastic sheeting by Town of Machias personnel in early 1987. This sandy material, which underlay the drums stored in the pit, was excavated and placed on the plastic as recommended by NYSDEC after the last drums were removed. The mound was covered and it was recommended that it be uncovered periodically and "worked" to aid the volatilization process. A letter dated 24 June 1987 from NYSDEC to the Town of Machias supervisor stated that inspections "have not shown any evidence that the soil is being turned over periodically" (Appendix I).

A sample of the material, composited over the 0- to 2-ft interval, was collected. Sampling was facilitated through a hole dug to the desired depth with a shovel. The sample material was collected with laboratory-cleaned stainless steel spoons. The material in the area of SS-1 was reported to have been hard, cobble filled, and difficult to penetrate. Slight staining of the sandy matrix as well as an "oily" odor was noted by the on-site geologist.

Sample SS-2 was collected from the floor of the gravel pit in an area noted to have had drums stockpiled. The sampling procedure was identical to that performed for SS-1. The material was described as consisting of soft, loose sands. The on-site geologist noted that the sampled material was moist and contained a "sweet solvent" odor.

The two soil samples were originally collected in October 1988. The analyses of these samples, like the well samples, failed the QA/QC review performed by Nytest (Appendix G). The soils were resampled in approximately the same locations in May 1989 at the same time the wells were resampled.

CHAPTER 4

CHAPTER 4

SITE ASSESSMENT

4.1 SITE HISTORY

The following text summarizes pertinent information regarding the history of the Machias Gravel Pit, as revealed during the literature review. All documents described are chronologically arranged and are preceded by a summary index in Appendix I, Applicable Records.

The Machias Gravel Pit, located on Very Road in the Town of Machias, was reported to have received approximately 600 drums of waste. These drums were part of an approximately 2500-drum lot that originated at the Motorola Plant in Arcade, New York, and was distributed to numerous sites throughout Cattaraugus County by unlicensed haulers.

During the LMS literature review, the first documentation uncovered about this lot of drums was dated 20 September 1978 when Mr. Dan Pascarella of the Cattaraugus County Department of Health (CCDOH) contacted Mr. Kevin Heinz of NYSDEC Region 9. Mr. Pascarella reported having observed 97 drums of waste at the nearby "old Machias dump" on Franklin Street the previous day. Labeling on the drums led Mr. Pascarella and an associate to the Motorola Plant in Arcade. In a conversation with Mr. Wyllie, a Motorola industrial engineer, it was confirmed that the drums had come from the Arcade plant. Mr. Wyllie said that the drum contents were not as labeled, but were waste cutting oils, epoxy resins, and steel shavings. It was also learned that a Mr. Daniel Griswald had been contacted to haul the drums, and had been doing so since April 1978. A final note was that Mr. Griswald may possibly have sold some drums to

Mr. Donald Krepps of the Town of Machias Highway Department. This is worth noting because the highway department ran the gravel operations on Very Road and at one time had a garage located on the property.

Subsequent investigations by Mr. Pascarella and Mr. Chester Halgas confirmed that Motorola had contracted for the removal of 2500 drums that had been distributed throughout the county by private haulers. From March 1978 to the end of September Mr. Griswald had reportedly hauled approximately 600 drums to the Town of Machias Gravel Pit on Very Road. A letter from Mr. Halgas to Mr. Jack McMahon of NYSDEC dated 3 October 1978 reported that approximately half the drums had been emptied and that the town had used the waste material to oil some of the town roads. The letter also contained a list of waste products generated at the Motorola Plant that may in part have made up the drum contents. Information on the chemical makeup of many of the products used by Motorola and statements regarding the degree of toxicity of the substances were included.

A gap in available data exists from October 1978 to September 1983 when RECRA Research (now RECRA Environmental) of Amherst, New York, submitted their New York State Superfund Phase I Summary Report on the Machias Gravel Pit. In addition to a site reconnaissance, RECRA conducted a literature review of the site history as well as the local geology, hydrology, and general environmental setting.

During the Phase I investigation RECRA reported the presence of 75 drums on site and stained soil in the area of the stored drums.

Because of the lack of available data, RECRA recommended a Phase II investigation to address inadequacies in the data base so as to permit a complete and accurate site characterization and HRS ranking. Included in RECRA's report is a proposed Phase II work plan.

RECRA's executive summary stated that "approximately one-half of the drums received had their contents emptied."

A letter dated 9 May 1985 from Mr. Raymond Lupe of the NYSDEC Bureau of Hazardous Site Control to Mr. Lawrence Clare of the NYSDEC Region 9 office discusses a proposed work plan for a Phase II investigation of the Machias Gravel Pit prepared by Walter B. Satterthwaite Associates Inc. (WBSAI) of West Chester, Pennsylvania. It appears that WBSAI, a consultant to the Town of Machias, submitted the work plan in response to a motion by the town to complete the investigation independent of, but with the approval of, NYSDEC. The letter details the inadequacies of the plan and sets the RECRA Phase II proposal (September 1983) as the standard that the proposed plan did not meet.

On 21 May 1985 Mr. Peter J. Buechi, associate sanitary engineer for NYSDEC, advised the Honorable Lee Bull, supervisor of the Town of Machias, of the proposal's shortcomings and notified him that if the town carried out the proposed work, it would be proceeding at its own risk, and that once the work was completed, further study might still be necessary to fulfill Phase II requirements.

WBSAI conducted limited sampling and analysis of the groundwater and a geophysical survey of the Machias Gravel Pit on 26 August 1985 and submitted its findings to NYSDEC on 20 November 1985. The report states that the study was performed in partial fulfillment of an investigation, similar to a NYSDEC Phase II study, that was being undertaken by the town. The study consisted of sampling existing wells (residential wells downgradient) and making several geophysical traverses as part of a conductivity survey.

WBSAI in its site history reports that they were retained in September 1984 to advise the Town of Machias on the best course of action to resolve pending enforcement or investigative action by NYSDEC. They report having conducted a site inspection on 12 October 1984 that included the excavation of eight test pits across the site to depths of 7 to 12 ft. While surface soils were reportedly stained in the areas of drum storage, no signs of soil discoloration, odor, waste material, or saturation were encountered in the subsurface. On 29 January 1985 WBSAI submitted a soil removal, water sampling, and development of remedial alternatives work plan to NYSDEC.

As a result of this work plan the four nearby existing wells owned by Mr. Judd Cole were sampled on 26 August 1985. Samples were analyzed qualitatively for base/neutral and acid extractable organics and quantitatively for National Primary Drinking Water Regulations (NPDWR) metals. WBSAI reported no observable impact from the wastes as the water samples were essentially devoid of the eight metals for which they were analyzed. This statement was made in light of the fact that no analytical data for volatile organics were generated from the organic scan as a result of the failure of the associated spike to pass quality control. Subsurface conductivity signatures generated from the geophysical survey appeared to be uniform and nonconductive, thereby reducing the likelihood of a contaminant plume.

The RECRA Phase I investigation report of September 1983 attested to approximately 75 drums present on site; the WBSAI report states that 151 drums were observed as of May 1985.

On 23 October 1985 NYSDEC personnel received the analytical results of samples of four drums and two areas of stained surface soil taken on 6 September 1985. Analysis of the drums showed the presence of 1,1,1-trichloroethane, 1,1-dichloroethylene, bromodichloromethane, 4,4-DDD, 4,4-DDE, 4,4-DDT, and endrin. Soil samples contained phenanthrene, di-n-octylphthalate, 1,1,1-trichloroethane, trichloroethylene, methylene chloride, and heptachlor epoxide.

WBSAI again sampled three of the wells downgradient (east) of the site owned by Mr. Cole on 30 December 1985 and sent the samples to RECRA for organic screening by gas chromatography (GC) using a flame ionization detector (FID). Samples from the house well, the cabin well, and the barn well all failed to reveal any contamination above the detection limits of the organic scan.

WBSAI submitted a cleanup plan proposal to NYSDEC for review and approval in February 1986. The plan included the results of sampling, testing, and inventorying of approximately 100 empty and 66 partially filled drums as well as proposed methods for the removal and disposal of the drums, drum contents, and surficial soil that had been contacted by some of these materials in the past.

Each drum containing material had been sampled using a Coliwasa-type drum sampler on 3 December 1985. Drum contents were logged and examined for color, odor, and consistency and were scanned with a portable organic vapor analyzer (OVA) and tested for their behavior in water. The investigation concluded that the majority of the drums appeared to contain water, oil-based paint residues, or a mixture of these components. Two drums were identified as containing a chlorinated hydrocarbon and another a water-soluble oil. A composite sample consisting of all drum samples except the ones containing chlorinated materials was submitted to DuPont Wastewater Treatment Service, Deepwater, New Jersey, for treatability analysis. The results of the analysis indicated that the composited material was compatible with and treatable by their process.

WBSAI proposed to contract Delaware Container Company Inc. to transport the drummed materials to the DuPont facility for treatment. The drums of chlorinated material were proposed to be disposed of at a permitted facility operated by CECOS in Niagara Falls, New York. The remaining empty drums and the estimated 7 to 10 yd^3 of sand and gravel that may have contacted the material were proposed for disposal at the nonhazardous Chaffee Landfill.

On 1 February 1986 WBSAI again resampled the four wells on the Cole property. Samples were submitted to RECRA for organic scan and priority pollutant analyses. While all four samples passed the organic scan, the house well was determined to contain 5.8 ug/l chloroform when tested for priority pollutants.

The New York State Department of Health (NYSDOH) sampled the shop tap on the Cole property on 19 March 1986 and in a data package dated 11 April 1986 reported a concentration of 4 ug/l of chloroform.

Mr. Clare of NYSDEC, in a letter to Mr. Reisner of CCDOH dated 4 March 1986, lists information obtained from Mr. Ron Tramantano regarding chloroform contamination. One point made is that the presence of chloroform and the absence of any other organics in a water supply well is unusual. No cases of chloroform alone in a water supply well have been shown to be associated with a hazardous waste site.

Lye Creek, believed to be the tributary to Ischua Creek, which crosses Very Road just south of the gravel pit, was sampled by NYSDOH on 4 November 1986. Analysis of the sample for trihalomethanes came up negative.

On 16 March 1987 Mr. Buechi of NYSDEC responded to inquiries made by Mr. Joseph C. Dwyer of the law firm of Dwyer and Dwyer, Olean, New York, dated 27 February 1987. Dwyer and Dwyer, representing the Cole family, requested information regarding ongoing or additional plans to conduct testing of the Cole well water. Dwyer and Dwyer also included a letter from the Citizen's Clearinghouse for Hazardous Wastes, which reviewed the tests conducted by Satterthwaite and found them "somewhat lacking." Dwyer and Dwyer also presented NYSDEC with a "proposed monitoring program" suggested by Advanced Environmental Services of Niagara Falls. Mr. Buechi updated Mr. Dwyer on the state of the Machias investigation and referred him to NYSDOH and CCDOH, which have responsibility for potable water supplies.

On 20 April 1987 Mr. Richard Seaman of NYSDOH responded to an inquiry from Dwyer and Dwyer regarding the chloroform content of the Cole well. Mr. Seaman offered general information, e.g., that chloroform may be generated by chlorination of potable water, that it may be removed by activated carbon, and that the drinking water standards of 100 ug/l are based on the ingestion of 2 liters per day for 65 years.

A data gap exists from February 1986 when WBSAI submitted their cleanup proposal to 24 June 1987 when Mr. Clare of NYSDEC requested an update on the drum removal program being conducted by the town. Mr. Clare recorded that he oversaw drum removals on October 1986 and 27 February 1987. He inquired about the status of the report, the four drums remaining on site, and the contaminated soils. It appears that the filled drums, drum contents, and empty drums were removed and disposed of as proposed by WBSAI, and that an attempt to clean the contaminated soil by aeration of the volatiles was being made on site. The four drums said to be remaining were those containing chlorinated materials and hydraulic fluids.

In letters dated 2 and 5 November 1987 Mr. Clare again asked WBSAI and a town supervisor about the status of the cleanup. According to Mr. Clare's record, the contaminated soil was spread on plastic, covered, and was to be uncovered and worked to volatilize contaminants as per a WBSAI proposal. Mr. Clare again inquired about the four remaining drums and expressed concern about the town's continued mining operations in the area of contamination. At the start of the Phase II investigation by LMS, the contaminated soil was uncovered and appeared to have been left that way for a period of time; no drums remained on site.

Prior to 6 October 1986 an activated carbon filtration system was connected to the Cole well system, as evidenced by NYSDOH references (dated 6 October 1986) to samples of the Cole well as "before" and "after" filter. The analytical results indicate the presence of 2 ug/l chloroform before the filters and nothing above the detection limit after the filter. Resampling by NYSDOH on 11 May 1987 showed 1 ug/l chloroform before the filter and nothing above the detection limit after the filter. On 6 September 1988, when NYSDOH again sampled the Cole well, 1 ug/l chloroform was detected before and after the filter. This may indicate that the carbon in the filtration system might have needed to be changed. The most recent analytical data on the Cole well are from 1 December 1988 when Water Test Corp. of Manchester, New Hampshire, analyzed a sample (presumably taken by the Coles). The sample, taken after filtering, indicated 29 ug/l total trihalomethanes (21 ug/l chloroform, 3 ug/l chlorodibromomethane, and 5 ug/l dichlorobromomethane). Whether the charcoal in the activated carbon filter had ever been changed is unknown.

In August 1987 a Phase II investigation work plan was prepared by RECRA on behalf of LMS. During LMS' execution of the approved work plan in October of 1988, oversight was provided by NYSDEC. This Phase II report is the culmination of that concerted effort.

4.2 TOPOGRAPHY

Topography of the area around the Machias Gravel Pit consists of low rolling hills dissected by numerous perennial and intermittent streams. Drainage of the surrounding land flows in an easterly direction via Ischua Creek. Surface runoff from the site flows north and east via roadside ditches that ultimately discharge into the creek and one of its tributaries. Directly east of the site the Ischua Creek Dam forms a large spillway and wetland area. Bird Swamp occupies a large area approximately 2000 ft south of the site. Ischua Creek and Bird Swamp are both Class C water resources (Refs. 2, 3, and 4; Appendix A). Regulated wetlands exist both to the east and west of the site within one-half mile (Ref. 5, Appendix A).

4.3 GEOLOGY

The Machias Gravel Pit is located on a spur of the glacially rounded and scoured Canada Hill. Canada Hill increases in elevation adjacent to an elongated, north-south lowland. This lowland, a glacial trough with a U-shaped cross-profile, contains Bird Swamp. Glacial, lacustrine, and fluvial sediments partially fill the lowlands in the area. These Pleistocene and Holocene age surficial deposits, which fill the valleys, are also present in decreasing thicknesses over the uplands and make up the "sand and gravel" mined from the site of concern.

Underlying the glacial deposits, bedrock in the area is the Gowanda Shale Member of the Canadaway Formation. This formation underlies the Chadakain, an interbedded gray siltstone, shale, and coquinite formation that has been eroded in the area of the gravel pit but still exists in the nearby uplands.

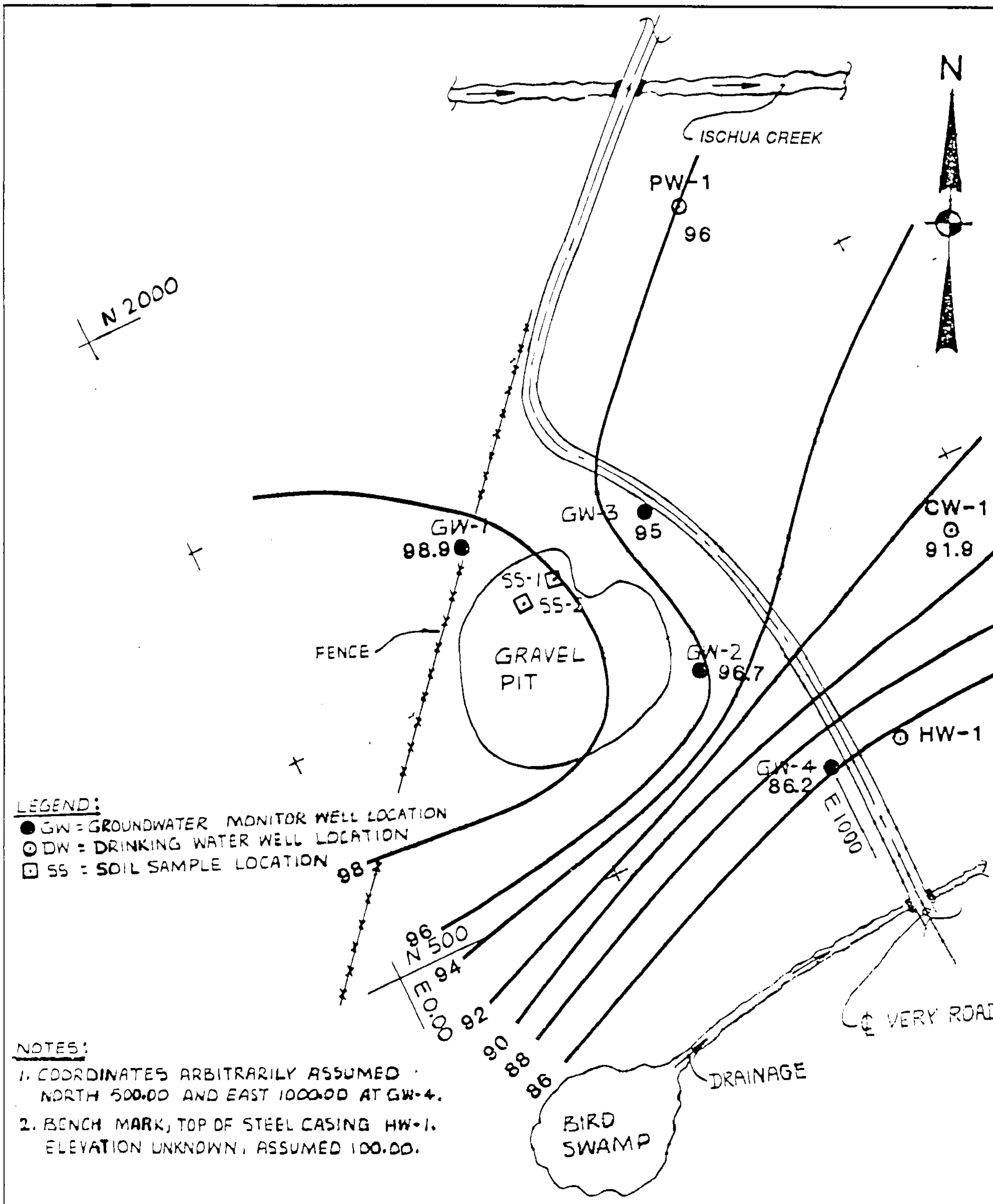
The Gowanda Shale consists of interbedded light gray to grayish-black shales and thin- to thick-bedded light gray siltstones. The entire unit is approximately 275 ft thick (Ref. 2, Appendix A).

4.4 HYDROLOGY

Topographically, the Machias Gravel Pit is located on a spur of Canada Hill (Figure 1-1). This results in the gravel pit's being centered near a topographic high, with the countryside sloping away fairly steeply to the east, north, and south and to a slight degree toward Canada Hill to the west.

The water table is a subdued expression of the surface topography. Lateral variations are inherent in glacial geology and these will impact on this assumption to some degree, but in a general sense it can be held true. This results in a mounding of the water table underneath the "spur" that has been excavated to form the gravel pit. Such a mound creates a radial gradient, with the top (side adjacent to Canada Hill) of the spur, roughly at its center, acting as a recharge point and the groundwater moving away from this central area.

The limited number of water table reference points we have support this assumption. GW-1, located near the topographic high, had the highest water table elevation, with elevations decreasing with distance to the northeast (PW-1), east (CW-1), and southeast (GW-4) (see Figure 4-1). The gravel pit enhances the radial drainage by providing a recharge point and possible mounding of water under the pit. In fact, the highest groundwater level may be centered over



0 100 200 ft

SCALE
1 in. = 200 ft

1988 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

FIGURE 4-1

GROUNDWATER CONTOURS
26 October 1988

Machias Gravel Pit
NYSDEC I.D. No. 905013

Source: Edward O. Watts & Associates
Buffalo, 1989

the pit and radial flow could go north (to GW-1), northeast (to GW-3), east (to GW-2), southeast (to GW-4), and south.

Although the flow from the pit or spur is probably radial, the contour lines suggest that the groundwater after the pit should be turning southeast toward the creek draining Bird Swamp.

4.4.1 Groundwater Supply

All residents in the area of the Machias Gravel Pit rely on private well water for domestic supplies. These wells are at reported depths of 30 to 40 ft and are screened in a gravel-till aquifer.

The water supply wells closest to the site are three that belong to the Cole residence, located approximately 500 ft to the east and southeast. With the exception of PW-1, the wells may be downgradient of the pit.

An unused well (PW-1), a well used for supply of a small cabin (CW-1), and the residence supply well (HW-1) were sampled as part of the Phase II study. Sampling procedures and analytical results are discussed in their respective sections. Analytical data appear in Appendix J.

4.5 PHASE II RESULTS

4.5.1 Site Inspection

The site inspection showed a sand and gravel pit surrounded by rolling hills and farmland. No drums remained visible on site, but the surface of the pit in the area of SS-1 and SS-2 showed obvious staining. The only equipment on site was the sand/gravel sorter used by the town and miscellaneous scrap metal outside the pit to the north in the area of the old town garage. This area was thick with seasonal brush and no sign of the garage remained.

The site was open and accessible. There was no indication of utility interferences. While the sides of the pit were steeply cut, a ramp made truck access possible. Open access to the well sites outside the pit was reported.

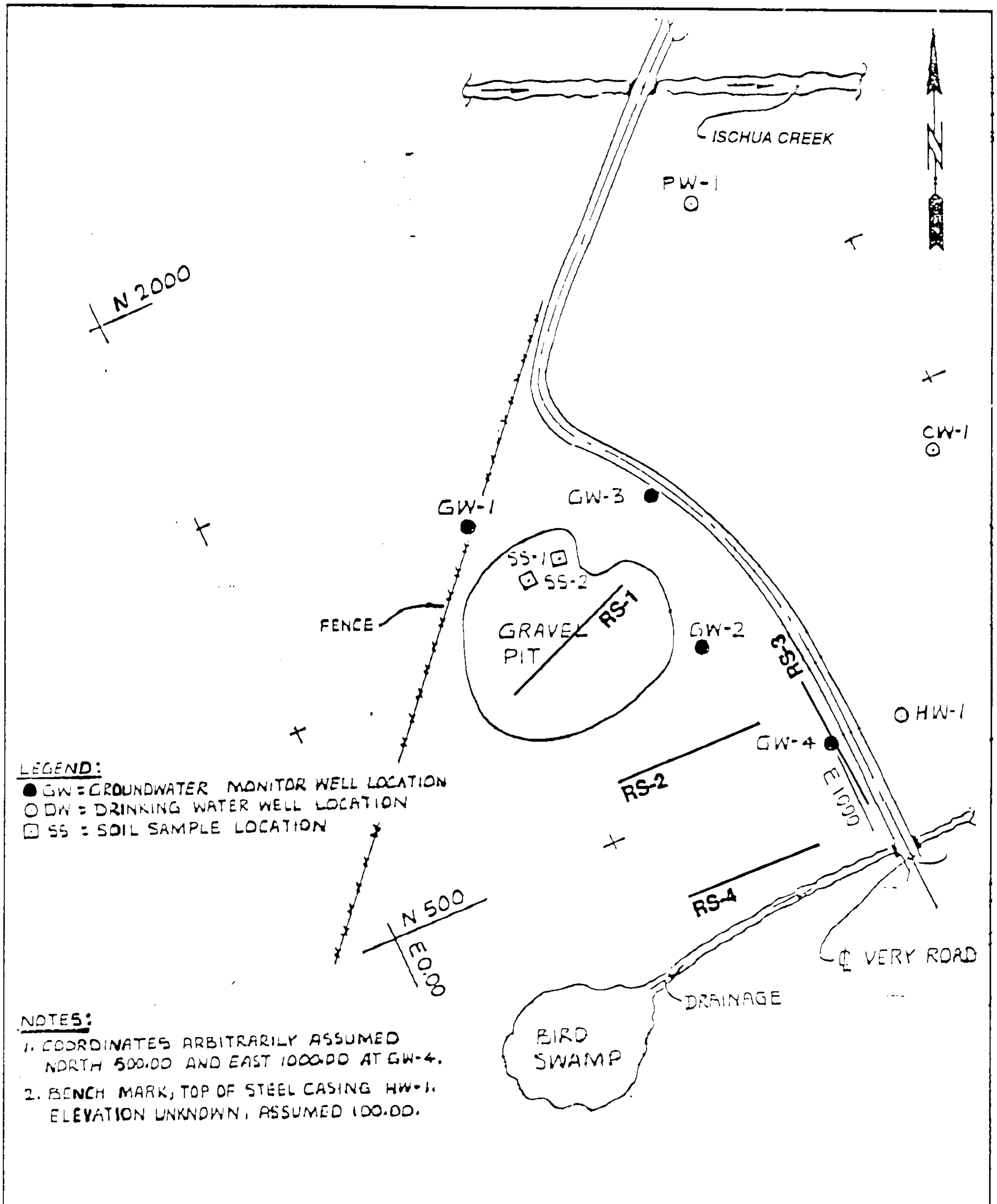
During this site visit, arrangements were made for access to Mr. Lou Shanks' property for the placement of the upgradient well and to Ms. Betty Cole's property for sampling of existing wells. During the reconnaissance, air monitoring with an HNU revealed no deflections above background from any locations, including the area of SS-1 and SS-2. The results and field notes of the site inspection are included in Appendix B.

4.5.2 Geophysical Data

The results of the resistivity survey are summarized in a report by Dunn Geoscience Corp. dated 7 September 1988 (Appendix D).

Qualitatively, according to Dunn, initial observations revealed that resistivity soundings RS-1 and RS-3 (see Figure 4-2) represent three cases where the first and third layers are less resistive than the second layers. Resistivity soundings RS-2 and RS-4 probably represent two-layer cases with a resistive layer above a less resistive layer.

In order to get a more quantitative interpretation, Dunn graphed the data ("A" spacings vs apparent resistivity). The resultant curve was then matched to theoretical curves representing two- and three-layer cases.



0 100 200 ft

SCALE
1 in. = 200 ft

1988 NYSDEC PHASE II INVESTIGATION	FIGURE 4-2 **RESISTIVITY SURVEY LINES**
LAWLER, MATUSKY & SKELLY ENGINEERS Pearl River, New York	Machias Gravel Pit **NYSDEC I.D. No. 905013** Source: Edward O. Watts & Associates Buffalo, 1989

The following geoelectric section was compiled by Dunn based on interpretation of the four resistivity soundings:

LAYER	DEPTH (ft)	AVERAGE RESISTIVITY (ohm-ft)
1	0-2	645
2	0-7	1050
3	Greater than 7	185

According to Dunn, one layer appears to be absent from resistivity soundings RS-2 and RS-4. These soundings appear to represent a two-layer case in which the second layer has a much greater resistivity than the third layer. Resistivity soundings RS-1 and RS-3 appear to be three-layer cases. At these locations layers 1 and 3 have lower resistivities than layer 2.

Dunn concludes the report with a preliminary interpretation of the characteristic geoelectric section consisting of the following:

- Layer 1 has a relatively low to moderate resistivity that could be indicative of an unsaturated glacial till, i.e., ablation till.
- Layer 2 has a relatively high resistivity that could be indicative of an unsaturated sand and gravel that contains minor amounts of silt and clay.
- Layer 3 has a relatively low resistivity that may be indicative of a saturated granular soil that contains electrolytes. This layer could also be representative of unsaturated or saturated clayey soils.

4.5.2.1 Additional Geophysical Survey. On 21 October 1988 International Exploration Inc. (Intex) conducted a preliminary magnetometer survey of a portion of the Machias Gravel Pit. This additional work was performed at the request of NYSDEC to determine whether a number of the drums once stored on the site may have been buried. The area of concern is in the northeast portion of the site, adjacent to the access road (Figure 4-3). Miscellaneous scrap metal was scattered across the surface. The suspected presence of buried drums was the reason for relocating GW-3 to this area.

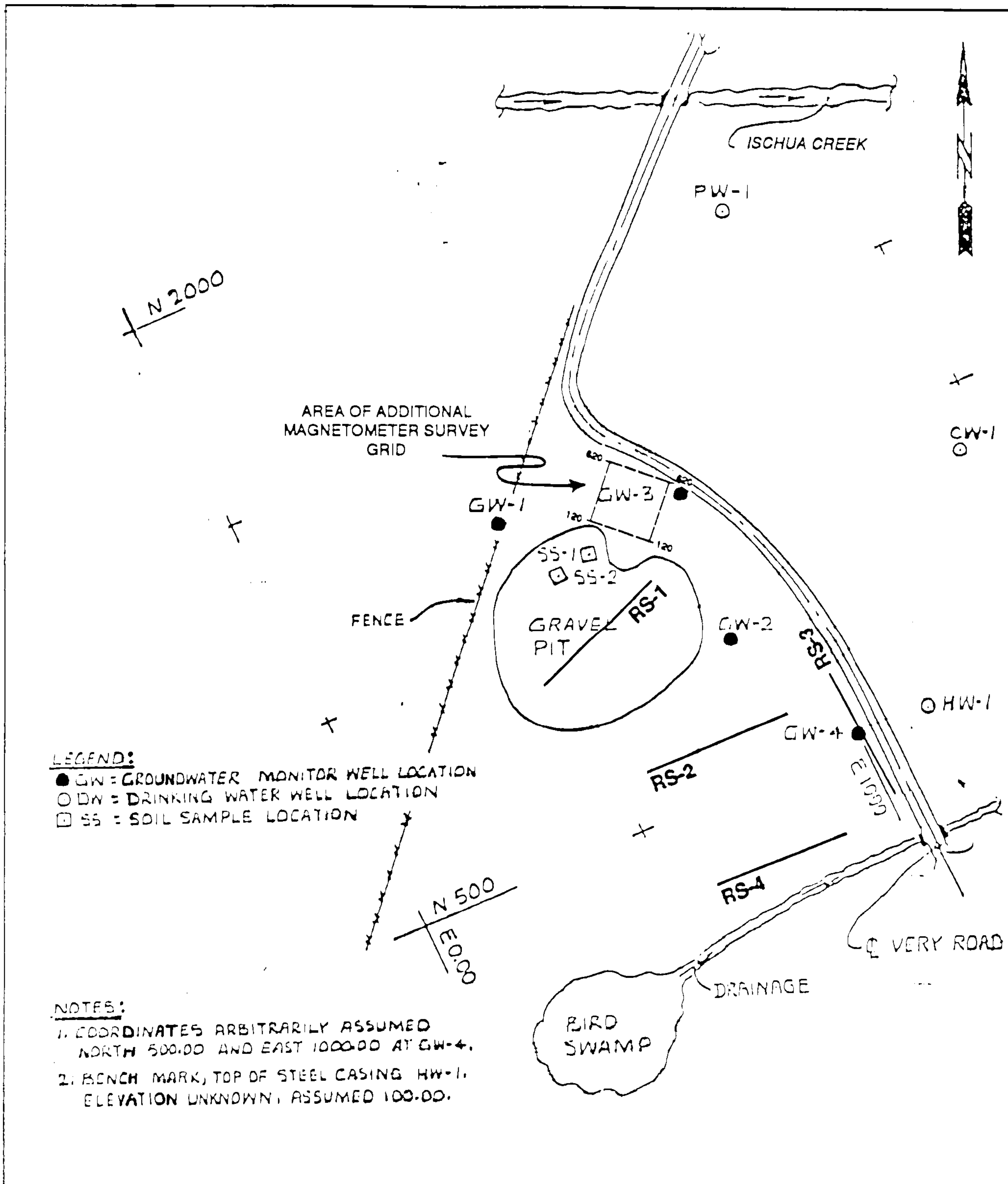
The Intex survey was conducted using a 20 ft by 20 ft survey grid. Interpretation of the data suggests the possibility of buried metal objects in the northwest corner of the survey area (Figure 4-4). The magnetic field values of the anomalous area, plotted as profiles for lines 320, 420, 520, and 620, are presented as Figure 4-5. The raw magnetic survey data are included in Appendix D.

4.5.3 Permeability Calculations

In situ permeability testing was performed on each monitoring well after sampling was completed rather than after development, as originally proposed, to minimize cross-contamination of the groundwater between wells. Hydraulic conductivity calculations were produced from the slug test data using the method developed by Cedergren (Ref. 1, Appendix A).

Cedergren used formulae taken from the U.S. Department of the Navy that are applicable to varying well and water table configurations. An electric water level meter installed at an arbitrarily determined point corresponding to 92.5% of the recovery to the original static water level (based on an instantaneous displacement of 2 ft within the well casing) was used to gather data.

A series of time-lag measurements was taken at each well for both falling and rising heads to within 0.15 ft of the static water



0 100 200 ft

SCALE
1 in. = 200 ft

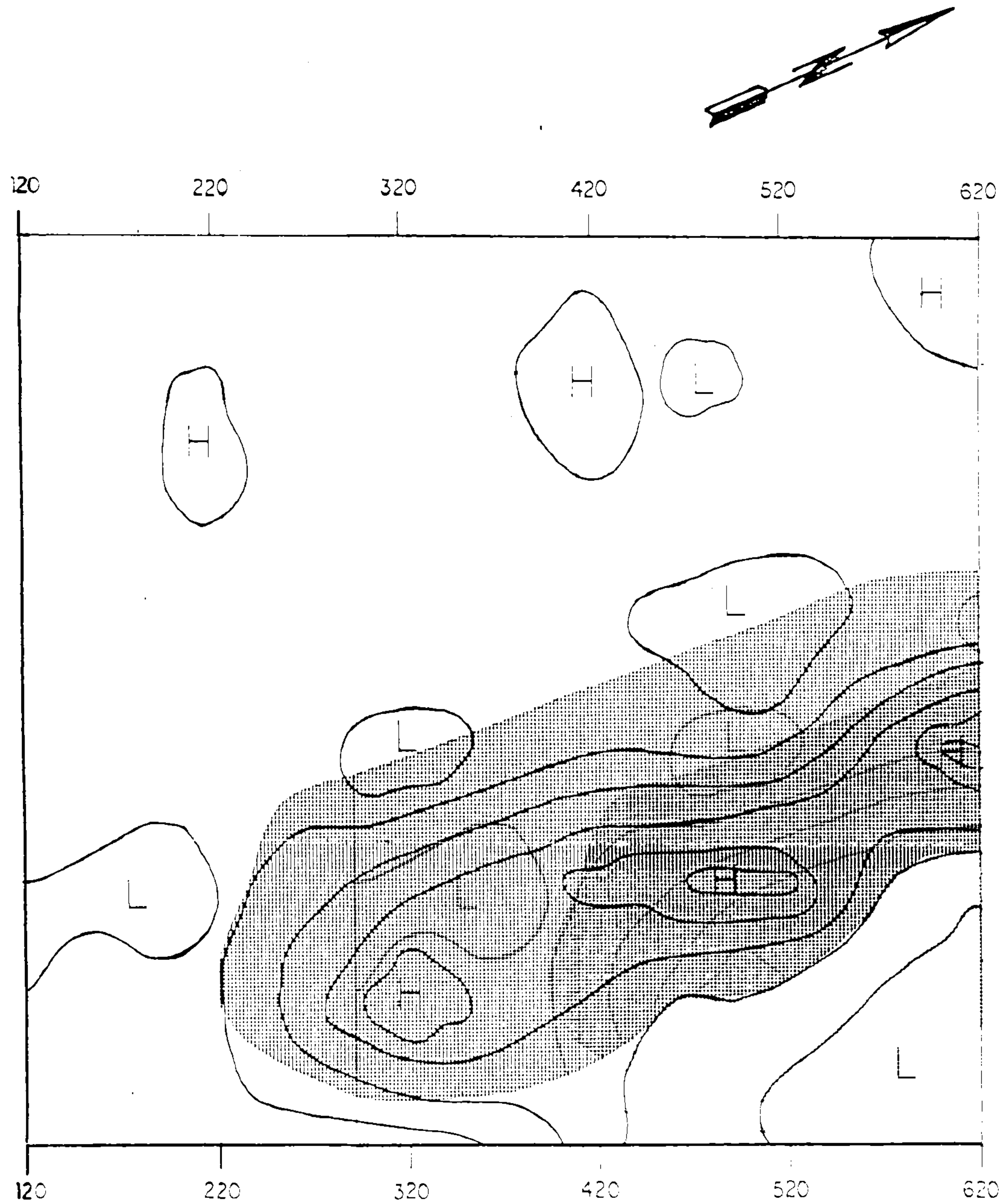
1988 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

FIGURE 4-3

MAGNETOMETER SURVEY AREA

Machias Gravel Pit
NYSDEC I.D. No. 905013
Source: Edward O. Watts & Associates
Buffalo, 1989



20 ft x 20 ft grid system

LEGEND

H Magnetic high

L Magnetic low

120 Survey line

Anomalous area (Suspected source: ferromagnetic material)

Magnetic contour line

FIGURE 4-4

MAGNETOMETER SURVEY

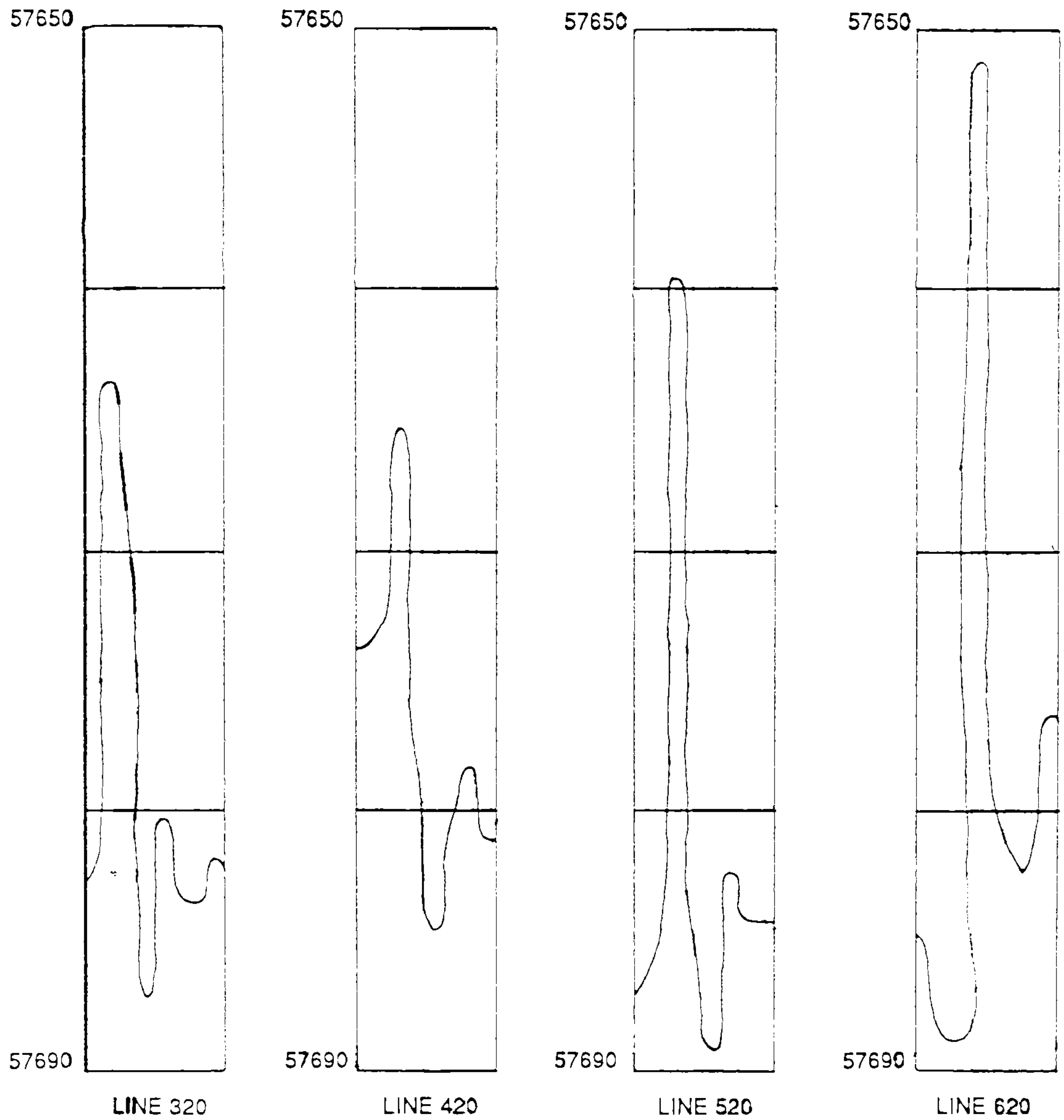
Machias Gravel Pit

NYSDEC I.D. No. 905013

1986 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS

Pearl River, New York



1988 NYSDEC PHASE II INVESTIGATION	FIGURE 4-5
LAWLER, MATUSKY & SKELLY ENGINEERS Pearl River, New York	MAGNETIC PROFILES OF SELECTED LINES FROM THE VERY ROAD MAGNETIC SURVEY Machias Gravel Pit NYSDEC I.D. No. 905013

level. These measurements were then reduced statistically to a mean value that was used on the appropriate formula. Several individual measurements were taken in an attempt to isolate erroneous data that may not have been perceptible during a single test.

Actual hydraulic conductivity calculations use a formula presented in Cedergren (Ref. 1, Appendix A) for an observation well in a saturated isotropic stratum of infinite depth, using a cased hole with encased or perforated extension (L). The formula for hydraulic conductivity is:

$$K = \frac{R^2}{2L(t_2-t_1)} \ln \frac{L}{R} \ln \frac{h_1}{h_2}$$

The final answer, given in feet per second, was translated into meters per day to correlate with average permeability values for various saturated media given in Driscoll (Ref. 6, Appendix A). This table was used in an effort to validate data against known values for material that corresponds to sediments encountered during the drilling and well installation process.

R = radius of well casing in feet
L = length of saturated screen
t_1 = time in seconds at instantaneous head displacement; assumed to equal 0 seconds
h_1 = theoretical instantaneous head displacement; assumed to be equal to 2 ft within the well casing
t_2 = value of time measurement from linearization of mean values for 92.5% recovery of static water level following 2-ft instantaneous displacement
h_2 = active head elevation following linearization of mean values from recovery of a 2-ft instantaneous head dis placement

GW-1 Hydraulic Conductivity Calculations (K)

$$K = \frac{0.0069\ ft^2}{2(9.7\ ft)(50_s-20_s)} \ln \frac{9.7}{0.083} \ln \frac{0.4}{0.105}$$

$$= 1.0 \times 10^{-4}\ ft/sec = 1.9\ m/day = 6.46 \times 10^1\ gpd/ft^2$$

This value represents the typical published K values for sediments within this grain-size category.

GW-2 Hydraulic Conductivity Calculations (K)

$$K = \frac{0.0069 \text{ ft}^2}{2(9.43 \text{ ft})(6_s - 2_s)} \ln \frac{9.43}{0.083} \ln \frac{0.44}{0.082}$$

$$= 2.3 \times 10^{-3} \text{ ft/sec} = 6 \times 10^1 \text{ m/day} = 1.48 \times 10^3 \text{ gpd/ft}^2$$

This indicates a less mobile, coarser-grained fraction than was identified in GW-1, which also corresponds to the increased volume of water generated from these sediments during purging.

GW-3 Hydraulic Conductivity Calculations (K)

$$K = \frac{0.0069 \text{ ft}^2}{2(10.11 \text{ ft})(150_s - 50_s)} \ln \frac{10.11}{0.083} \ln \frac{0.47}{0.11}$$

$$= 2.37 \times 10^{-5} \text{ ft/sec} = 6.2 \times 10^1 \text{ m/day} = 1.53 \times 10^1 \text{ gpd/ft}^2$$

GW-3 was found to be within the same order of magnitude as GW-1, and aquifer sediments identified within this area remain at a relatively low yield level.

GW-4 Hydraulic Conductivity Calculations (K)

$$K = \frac{0.0069 \text{ ft}^2}{2(11.45 \text{ ft})(200_s - 50_s)} \ln \frac{11.45}{0.083} \ln \frac{0.66}{0.16}$$

$$= 1.40 \times 10^{-5} \text{ ft/sec} = 3.6 \times 10^{-1} \text{ m/day} = 9.0 \text{ gpd/ft}^2$$

K values for GW-4 were believed to be lower because of a clay layer that was encountered several feet prior to termination of the boring. The possibility exists that ultrafine-grained clay was deposited on the lower water-bearing zones of the borehole, thus impeding the flow of water into the well. This material could not be cleared during normal development.

4.5.4 Monitoring Well Data

State groundwater GA standards were used as a basis for evaluation of the monitoring well sample contaminant levels. NYSDEC defines Class GA groundwaters as follows: "the best usage of Class GA waters is as a source of potable water supply. Class GA waters are fresh ground waters found in the saturated zone of unconsolidated deposits and consolidated rock or bedrock." On 9 January 1989 NYSDOH standards for organic chemicals in public drinking water supplies became effective. NYSDEC Class GA standards state that groundwater quality standards shall be the most stringent of the maximum contaminant levels for drinking water promulgated by the Comissioner of Health, including all revisions. The new NYSDOH drinking water maximum contaminant levels are therefore applicable to these groundwaters, as outlined in the NYSDEC Class GA groundwater standards. Briefly, the new NYSDOH standards are:

Principal organic contaminant (POC) - 5 ug/l
Unspecified organic contaminant (UOC) - 50 ug/l
Total of POCs and UOCs - 100 ug/l

POCs are defined as any organic chemical belonging to any of the six general chemical classes listed below (excluding those compounds that already have a specific maximum contaminant level [MCL] of their own, such as trihalomethanes):

Halogenated alkanes
Halogenated others
Halogenated and substituted halobenzenes
Benzene and alkyl- or nitrogen-substituted benzenes
Substituted unsaturated aliphatic hydrocarbons
Halogenated nonaromatic cyclic hydrocarbons

UOCs are defined as any organic chemical that is not a POC and is not covered by another MCL.

The monitoring well data from the Machias Gravel Pit are compared against these standards and the Class GA standards. The analytical results of samples collected from the four monitoring wells installed on-site and the three previously existing water supply wells (the Cole cabin well [CW], the Cole house well [HW], and the potable well in the field [PW]) during the May 1989 resampling are listed in Tables 4-1 and 4-2 (the data are in Appendix J) and discussed in the following subsections.

4.5.4.1 Volatile Organics. Only one well, GW-3, was found to contain volatile compounds (Table 4-1). Methylene chloride was reported at low concentrations in the samples from four wells in addition to the blank, but this is attributed to laboratory contamination. The sample from GW-3 contained unsaturated aliphatic hydrocarbons and one halogenated alkane compound. The unsaturated aliphatic hydrocarbons detected were trichloroethene at 62 ug/l and 1,1-dichloroethene at a level below the method detection limit (BMDL). The halogenated alkane 1,1,1-trichloroethane was found at 440 ug/l. Combining the levels of unsaturated aliphatic hydrocarbons and halogenated alkanes found at concentrations above the detection limits yields a total of 502 ug/l POCs in the sample from GW-3. This far exceeds the NYSDOH standard of 5 ug/l total POCs. These volatiles are compounds, or the degradative product of compounds, known to have been used as degreasers by Motorola. The GW-3 sample also contained a compound tentatively identified as 1,2,2-trichloro-1,2,2-trifluoroethane. This compound, a colorless, nearly odorless volatile liquid, is commonly used as a dry cleaning solvent, fire extinguishing agent, ploymer intermediate, and to dry electronic parts and precision equipment (Refs. 7 and 8, Appendix A). It was detected at an estimated concentration of 190 ug/l, a level that was still BMDL.

TABLE 4-1

MAY 1989 WATER DATA SUMMARY

Machias Site NYSDEC I.D. No. 905013

PARAMETER	GWR-1	GWR-2	GWR-3	GWR-4	HW-1	PWR-1	CWR-1	FIELD BLANK	GWR-2MS	GWR-2MSD	GWR-1MS	GWR-1MSD
VOLATILE ORGANICS												
Methylene chloride	ND	ND	ND	1 bj	2 bj	1 bj	2 bj	ND	ND	1j	NR	NR
1,1-Dichloroethene	ND	ND	11 j	ND	ND	ND	ND	ND	ND	ND	NR	NR
1,1,1-Trichloroethane	ND	ND	440	ND	ND	ND	ND	ND	ND	ND	NR	NR
Trichloroethene	ND	ND	62	ND	ND	ND	ND	ND	ND	ND	NR	NR
Tentatively Identified Compounds												
1,2,2-Trichloro-1,2,2-ethane	ND	ND	190 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
SEMIVOLATILES												
Phenol	ND	3 j	7 j	ND	ND	ND	ND	ND	NR	NR	ND	ND
Bis(2-ethylhexyl)phthalate	4 j	ND	ND	ND	ND	ND	ND	ND	NR	NR	9 j	23
Di-n-octyl-phthalate	ND	ND	7 j	ND	ND	ND	ND	ND	NR	NR	ND	ND
Tentatively Identified Compounds												
4,4'-Butylidenebis(3-methyl-6-tert-butyl-phenol)	74 j	ND	20 j	46 j	ND	12 j	ND	ND	NR	NR	NR	NR
1-Methyl-2-pyrrolidinone	ND	48 j	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
Unknown	ND	ND	88 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
Unknown carboxylic acid	ND	ND	16 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,2-Benzene dicarboxylic acid	ND	ND	8 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
PESTICIDES/PCBs												
None detected	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR

All data in ug/l.

HW - Cole house well.
CW - Cole cabin well.
PW - Potable well in field.

b - Found in method blank.
j - Estimated concentration; compound present below method detection limit.
ND - Not detected at analytical detection limit; see Appendix J for detection limit.
NR - Not run.

TABLE 4-2

MAY 1989 WATER DATA SUMMARY

Machias Site NYSDEC I.D. No. 905013

METER	CWR-1	FIELD BLANK	GWR-1	GWR-2	GWR-3	GWR-4	HW-1	PWR-1	6 NYCRR PART 703.5 GW STANDARDS
METALS (ug/l)									
Aluminum	ND	31.8 B	30200	4380	8970	8960	ND	218	NS
Antimony	ND	ND	33.1 B	ND	ND	ND	ND	ND	NS
Arsenic	ND	ND N	15.8 B W	4.4 B W	6.8 B	6.9 B W	ND	ND	25
Barium	375	ND	373	186 B	150 B	101 B	140 B	89.2 B	1000
Beryllium	ND	ND	1.7 B	ND	1.2 B	1.5 B	ND	ND	NS
Cadmium	ND	ND	ND	ND	4.8 B	ND	ND	ND	10
Calcium	60700	88.5 B	227000	75100	146000	100000	100000	28900	NS
Chromium	ND	ND	96.2	29.3	14.9	20.2	ND	ND	50 (a)
Cobalt	ND	ND	36.4 B	9.9 B	11.7 B	10.9 B	ND	ND	NS
Copper	ND	ND	195	120	89.9	38.2	ND	ND	1000
Iron	1050	12.3 B	88600	11700	24200	21300	9.9 B	7770	300 (b)
Lead	ND	ND	57.3	14.0	23.3	10.4	1.3 B	1.4 B	25
Magnesium	9230 E	ND	55800	17600	33400	18500	20300 E	5630 E	NS
Manganese	101	1.6 B	2060	1630	595	524	ND	308	300 (b)
Mercury	ND N	ND N	ND N	ND N	ND N	ND N	ND N	ND N	2
Nickel	ND	ND	94.5	42.4	29.1 B	32.8 B	ND	ND	NS
Potassium	ND	ND	14700	4760 B	2480 B	3300 B	ND	ND	NS
Sodium	3170 B	ND	8430	22700	6130	16400	15000	11100	NS
Vanadium	ND	ND	55.3	9.8 B	17.5 B	15.4 B	ND	ND	NS
Zinc	5.3 B	18.2 B	542	209	268	134	7.0 B	520	5000
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	NS
SPECIFIC CONDUCTANCE (umhos/cm)	410	4.8	710	490	750	530	660	220	NS

HW - Cole house well.
CW - Cole cabin well.
PW - Potable well in field.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Value estimated due to interference
ND - Not detected at analytical detection limit; see Appendix J for detection limit.

N - Spiked sample recovery is not within control limits.
NS - No standard.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
(a) - Hexavalent standard.
(b) - Combined standard not to exceed 500 ug/l.

4.5.4.2 Semivolatile Organics. Several semivolatile compounds, phthalate-acid-esters (PAEs) and phenol, were detected at low levels in three of the on-site monitoring wells (Table 4-1). The PAE compounds bis(2-ethylhexyl)phthalate and di-n-octyl-phthalate were detected at low levels, BMDL, in GW-1 and GW-3, respectively. Phenol was estimated at levels BMDL at GW-2 and GW-3. A number of tentatively identified semivolatile compounds were detected at levels below the respective method detection limits in each of the four on-site monitoring wells. Total tentatively identified semivolatile concentrations were 74, 48, 132, 46, and 12 ug/l at GW-1, GW-2, GW-3, GW-4, and PW-1, respectively. The compound 4,4 butylidene-bis-2-phenol was the most prevalent tentatively identified compound, detected in estimated concentrations of 74, 20, 46, and 12 ug/l in samples from GWR-1, GWR-3, GWR-4, and PWR-1, respectively. This compound is commonly a white powder that is used as an antioxidant for rubber (Ref. 7, Appendix A).

4.5.4.3 Pesticides/PCBs. No pesticides or PCBs were detected in any of the groundwater samples collected.

4.5.4.4 Metals and Cyanide. Metal concentrations exceeded NYSDEC GA groundwater standards for at least one metal from each of the wells sampled except the Cole house well. The chromium, iron, and manganese concentrations in GW-1, GW-2, GW-3, and GW-4 exceeded the groundwater standards, but this may be due to naturally occurring overburden constituents. Levels of iron and manganese in PW-1, iron in CW-1, and lead in GW-1 in excess of the standards may be attributed to the same influence. Elevated levels of many of the metals found in the sample from GW-1, in particular antimony, arsenic, chromium, iron, magnesium, manganese, nickel, vanadium, and zinc, may be attributed to the high turbidity of the sample collected from the well. The low yield limited the development and purging of GW-1, which was bailed to dryness twice and allowed to recover fully before sampling, but very turbid samples still resulted.

No cyanide was detected in any sample.

4.5.5 Surface Soils Data

The samples of the surface soils at the bottom of the gravel pit were collected for chemical analysis during the May 1989 resampling. The soil samples were analyzed for target compound list (TCL) organics, volatile and semivolatile fractions, PCBs/pesticides, and metals in accordance with Contract Laboratory Protocol (CLP). Tables 4-3 and 4-4 summarize the chemical data for the soil samples at the Machias Gravel Pit.

4.5.5.1 - Volatile Organics. Volatile organics were detected in both soil samples in total concentrations of 245.3 ug/kg (SS-1) and 27 ug/kg (SS-2). Excluding methylene chloride, acetone, and chloroform, common laboratory contaminants also found in the blanks, six volatile compounds were detected in sample SS-1; only one was revealed in sample SS-2. Trichloroethene, found at a level below the analytical detection limit, was the only volatile organic found in sample SS-2.

Trichloroethene was detected in sample SS-1 at 98 ug/kg along with two associated chlorinated volatiles, 1,1,1-trichloroethane at 100 ug/kg and tetrachloroethene at 1 ug/kg (below the analytical detection limit). Xylene at 3 ug/kg was also detected below the analytical detection limit, as were two tentatively identified compounds, 1-ethyl-2-methyl-benzene and 1,2,3-trimethyl-benzene (7.3 and 15 ug/kg, respectively). Trichloroethene was a degreaser used by Motorola (Ref. 9, Appendix A). Xylene was a compound also used by Morotola (Ref. 9, Appendix A). In a later investigation of the

TABLE 4-3

MAY 1989 SOIL DATA SUMMARY

Machias Site NYSDEC I.D. No. 905013

PARAMETER	SSR-1	SSR-2	SSR-2MS	SSR-2MSD
VOLATILE ORGANICS				
Methylene chloride	11 b	9 b	10 b	10 b
Acetone	14 b	13 b	10 bj	18 b
Chloroform	ND	2 bj	2 bj	2 bj
1,1,1-Trichloroethane	100	ND	ND	ND
Trichloroethene	98	3 j	ND	ND
Tetrachloroethene	1 j	ND	ND	ND
Xylene (total)	3 j	ND	ND	ND
Tentatively Identified Compounds				
1-Ethyl-2-methyl-benzene	7.3 j	ND	NR	NR
1,2,3-Trimethyl-benzene	15 j	ND	NR	NR
SEMIVOLATILES				
Phenanthrene	240 j	130 j	230 j	140 j
Anthracene	ND	57 j	ND	43 j
Di-n-butylphthalate	1800	97 j	100 j	210 j
Fluoranthene	ND	220 j	290 j	120 j
Pyrene	ND	230 j	ND	ND
Benzo (a) anthracene	ND	160 j	240 j	84 j
Bis (2-ethylhexyl) phthalate	740 b	320 j	540	640
Chrysene	150 j	200 j	270 j	110 j
Di-n-octyl-phthalate	ND	ND	ND	330 j
Benzo (b) fluoranthene	ND	630	250 j	93 j
Benzo (k) fluoranthene	ND	630	290 j	140 j
Benzo (a) pyrene	ND	230 j	240 j	90 j
Indeno (1,2,3-cd) pyrene	ND	100 j	ND	ND
Tentatively Identified Compounds				
Tricarbonyl-n-phenyliron	14200 j (3)	ND	NR	NR
Aldol	ND	1120 abj (2)	NR	NR
Unknown	59700 j (17)	20540 j (20)	NR	NR

All data in ug/kg.

( ) - Number of compounds in group total.
a - Suspected aldol condensation product.
b - Found in method blank.
j - Estimated concentration; compound present below method detection limit.
ND - Not detected at analytical detection limit; see Appendix J for detection limit.
NR - Not run.

TABLE 4-4

MAY 1989 SOIL DATA SUMMARY

Machias Site NYSDEC I.D. No. 905013

PARAMETER	SSR-1	SSR-2
METALS		
Aluminum	4330	4890
Antimony	ND	ND
Arsenic	3.4 B N	3.9 B N
Barium	19.0 B E	28.8 B E
Beryllium	0.14 B	0.15 B
Cadmium	ND	6.5
Calcium	43100	24600
Chromium	7.9	7.7
Cobalt	4.5 B	5.1 B
Copper	29.2	21.9
Iron	10800	13900
Lead	1080 *	197 *
Magnesium	5460 *	5660 *
Manganese	409	560
Mercury	ND	ND
Nickel	11.5	10.6
Potassium	ND	ND
Sodium	ND	ND
Vanadium	6.8 B	8.5 B
Zinc	107 E *	126 E *
Cyanide	ND	ND

All data in mg/kg.

* - Duplicate analysis not within control limits.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
e - Value estimated due to interference.
N - Spiked sample recovery is not within control limits.
ND - Not detected at analytical detection limit; see Appendix J for detection limit.
w - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.

drums stored on-site, one drum was concluded to contain a chlorinated hydrocarbon (Ref. 10, Appendix A).

4.5.5.2 Semivolatile Organics. Both SS-1 and SS-2 contained various polycyclic aromatic hydrocarbon (PAH) and phthalate acid ester (PAE) compounds. Sample SS-1 contained PAH compounds, phenanthrene and chrysene, at concentrations below the detection limits. The PAE compounds found in sample SS-1 were di-n-butylphthalate, at a concentration of 1800 ug/kg, and bis(2-ethylhexyl)phthalate, which was also found in the blank and may have been a laboratory contaminant. The PAH compounds detected in SS-2 were phenanthrene, anthracene fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(a)pyrene, and indeno(1,2,3)pyrene at levels below the detection limits and benzo(b)fluoranthene and benzo(k)fluoranthene at 630 ug/kg each. The PAE compounds found in SS-2 were di(n)butylphthalate and bis(2-ethylhexyl)phthalate, each at levels below the detection limits. The PAH compounds are indicative of a petroleum source, but straight-chain hydrocarbons associated with such a source are not present. These PAH compounds are often found in coal ash, coal tar, roofing tar, etc., but at much higher levels. These semivolatile compounds may have separate sources or may be indicative of a minor tar source or a residual petroleum product.

4.5.5.3 Metals. Elevated concentrations of lead were detected in the soils from both SS-1 and SS-2. Concentrations were 197 mg/kg at SS-2 and 1080 mg/kg at SS-1. Cadmium, at a concentration of 6.5 ug/kg in SS-2, was the only other metal found at elevated levels. While there are no NYSDEC numerical standards for soil contamination, these elevated parameters are not typical of the rural setting and indicate an outside source, such as leaded paints and/or fuels.

4.6 CONCLUSIONS

(Copies of all records found during the file search for this site are presented in Appendix I.)

4.6.1 Geophysical Survey

The resistivity survey conducted by Dunn along four traverses revealed a multiple-layer case. These layers are said to represent zones of varying resistivity. Dunn attributes the changes in resistivity to geologic or hydrologic layers. The interpretation of the resistivity findings, as discussed in Section 4.5.2, does not directly correlate with conditions encountered during the subsurface investigation and therefore no supported conclusions can be made.

The magnetometer survey by Intex indicated areas with high metallic readings, which may be caused by buried drums or other metallic wastes.

4.6.2 Groundwater

The topography of the area, the presence of the gravel pit, and the measured groundwater contours suggest that the groundwater flow may be radial from the gravel pit. If the flow is radial, GW-1 may not be a true upgradient well since one arm of the radial flow would be northward from the pit to GW-1. The presence of high metals and some semivolatiles in GW-1 would support this conclusion. Also, the contaminant source would be located at the point of high groundwater recharge and could result in a high dilution or rapid flushing of contaminants. Although the overall groundwater flow is probably to the southeast, the radial flow from the pit puts all the potable and monitoring wells (with the possible exception of PW-1) downgradient of the gravel pit.

The source of the metal contamination of several of the monitoring wells may be found in the naturally existing bedrock and glacial deposits. The Gowanda Shale consists of interbedded gray to grayish-black shales. Black shales owe their dark coloring to the presence of large amounts of organic debris in the area of deposition. Associated with a large organic content is a higher than average metal presence. Circulation of groundwater through these shales may result in elevated metals concentrations. A more likely scenario is the erosion of these dark shales by glacial abrasion and the subsequent unloading of debris rich in black shale fragments from which percolating water may leach metals. Glaciers advancing into the Machias area would also have passed over and scoured Precambrian Shield areas also known to have high metals concentrations. Again, this would result in the deposition of glacial debris, the source of which was various forms of metal-rich bedrock.

The silts and clays found in the glacial deposits of the Machias area may become rich in metals through divalent cation capture. In this process the metals are adsorbed and retained in an exchangeable state into the structure of the fine-grained deposits from the circulating groundwater. This fits the previously stated scenario in that the clays and silts may pick up the metals from water circulating through either the metal-rich shales or metal-rich glacial deposits. The cations may then result in high metals totals in turbid samples because the metals are adsorbed onto fines within the sample. Once the turbid sample is collected, any dilution during the analytical process may allow for base exchange, where the change in the environment caused by the addition of the dilutant releases these metal cations into the sample solution.

Another possibility is that these silts and clays have been contaminated by the contaminants dumped into the gravel pit. Waste paints, degreasers, and other wastes dumped at the site could be the cause of elevated metal concentrations in the groundwater. Radial groundwater flow from the pit would explain why GW-1 is also contaminated. Since the groundwater samples have few other detectable contaminants, the most likely source of the high metals concentrations is natural deposits.

The levels of organic compounds shown in the groundwater analyses point to contamination of the waters at GW-3. The concentrations and compounds found appear to be directly related to the wastes dumped at the pit. Also, GW-3 would be directly downgradient of the areas in which the wastes were dumped, if the groundwater flow is radial.

The levels found at the other wells are at such trace amounts that the source may be any of a number of possibilities. The compounds (solely semivolatiles) may be low-level results of dumping in the gravel pit. More likely possibilities are natural origin and laboratory-induced contamination. The phthalate compounds are common laboratory contaminants and, while not found in the blank, may possibly be tied to some sort of plastic (the sample jar lid) that the samples have contacted. The low concentrations also support this conclusion. The phenol compounds may form naturally. They are very soluble and may form from the natural decay of wood and any of a number of other natural processes.

4.6.3 Surface Soils

Samples SS-1 and SS-2 show signs of contamination. Sample SS-1, taken from the material previously mounded on the plastic, showed quite higher volatile contamination consisting mostly of 1,1,1 trichloroethane and trichloroethene, two solvents reportedly used by Motorola. While "mounded" on the plastic, this material is settling and extending past the plastic, and percolating (rain) water, once having reached the plastic, can easily travel laterally and run off the unbermed edges. The concentrations of volatile contamination, as well as semivolatile contamination in the form of di-n-butyl-thalate and to a lesser degree other compounds, are still present at levels high enough to leach into and add contamination to the underlying groundwaters. The concentrations of volatile and semivolatile compounds at SS-2 are much lower. This sample was collected adjacent to SS-1, but from material not being stored on the plastic. Several of the compounds are the same as those found at SS-1, but the lower levels can probably be attributed to freer leaching and percolating of rainwater due to the absence of the plastic sheeting at this location. While the soil still contains contaminants, the most prevalent are PAHs, probably in the form of a tar or a petroleum residue that is relatively insoluble and therefore does not pose much of a threat to the groundwater.

Although there are no standards for soil contamination, SS-1 and SS-2 contained concentrations of lead high enough to cause leaching of dissolved fractions into the groundwater.

4.6.4 Summary Conclusion

It has been well documented that contaminated wastes were dumped at the site and the soil samples confirm the continued presence of the contamination. The extent of the soil contamination is not known at this time. The analyses of samples from GW-3 indicate that this contamination has leached into the groundwater and traveled to the site boundary, but the other downgradient wells and the neighboring potable wells do not show the contamination.

It is not known why only GW-3 shows contamination; some reasons may be:

- Residual plume - The bulk of the wastes was dumped/leaked approximately 10 years ago. With the pit as a high recharge area and considering the sand-gravel nature of the soils in the area, the spilled wastes may have easily moved into the groundwater and downgradient. After 10 years most of the contaminants have been flushed out of the soils and groundwater and the contaminant plume has shrunk to affect only GW-3. The plume still exists because of residual wastes still in the pit, as the soil samples indicate.

- Another source - Similarly, the original source, of the contaminant plume may have been flushed out over the years, but another source near GW-3 is causing the reported contamination. The Intex magnetometry survey indicates some metals that could be drums. If the drums are just now beginning to leak, the plume may be just emerging or the leaks are so slow that the extent is small.

- Stratified plume - We have no information on the construction of the potable wells or what depths they are screened at. If the contaminant plume (either a surface or bottom plume) is stratified and the potable wells are not screened over that depth, the contaminants may be at these wells but are not being detected.

- Local hydrogeology - The local geology may be such that the contamination travels in very narrow bands and, although detected at GW-3, bypasses the other wells.

Whatever the reason, GW-3 has significant contamination and is suspected of being upgradient of the potable wells. Therefore, the gravel pit may pose a significant threat to the neighboring water supply and must continue to be studied and monitored.

4.7 RECOMMENDATIONS

Historically, the fact that waste solvents, paints, and oils from the nearby Motorola Plant were stored and spilled on site has been established. Analyses completed during the Phase II investigation confirmed the presence of volatile and semivolatile compounds in the soils at the bottom of the gravel pit. The groundwater at the site was found to contain volatiles at GW-3 and semivolatiles and high metals concentrations at some of the four monitoring wells. The presence of a semivolatile compound and high metals concentrations at the "upgradient" well, GW-1, has raised the possibility that the well may not be truly upgradient.

The results of the work thus far conducted in the Phase II investigation have raised several questions. Their resolution must precede any final conclusions about the extent and impact of contamination. In an effort to resolve these questions, the following additional studies are recommended:

- Soil borings and soil sampling to delineate the vertical and horizontal extent of contamination of the gravel pit floor: Based on the results of this investigation, recommendations as to soil excavation and removal or the feasibility of a renewed soil aeration program will be studied.
- Investigation of the high metals areas reported on the magnetometry survey near GW-3: Test pits should be dug to determine whether drums were found at this area and whether they are the cause of the contamination of well GW-3.
- Resurvey the site and surrounding area to enable the construction of an accurate contour map. Such a map would allow for the proper assessment of the gravel pit as a recharge area and aid in the analysis of gradient and direction of groundwater flow.

- Installation of additional monitoring wells and piezometers for continued water quality monitoring and to act as further water table reference points: Piezometers to the south and southwest and/or in the pit itself would establish the water table under the site and allow for better assessment of the risks of off-site contaminant migration. A better upgradient well and two additional downgradient wells should be installed, one to the south of pit and one possibly on the Cole property, to ensure proper screening of the groundwater.

- A quarterly sampling plan for the potable, existing monitoring, and proposed monitoring wells: After one year of sampling, these data may be reviewed for any increases or decreases in contaminant levels. This information will allow for a better assessment of the risks that the gravel pit poses to downgradient water supplies. In addition, surface water and sediment sampling from both Ischua Creek and Bird Swamp drainage creek to detect any possible contaminants originating from the site.

- A routine maintenance program for the carbon filter on the Cole residential well should be instituted: Data from previous sampling of this well have indicated that at times the filter appeared to be ineffective. Most likely it was because the active properties of the carbon were used up. Although the Phase II study found no volatile contamination in the nearby potable wells, some contamination was determined in the on-site wells. Therefore, until the site is remediated or the threat to the groundwater is determined to be not significant, the Cole potable wells should have active, working carbon filters. The only way to ensure that the filters are maintained is by a routine service program.

- A review of all data generated by the Phase II and additional studies herein recommended (which would constitute the initial phase of a remedial investigation) to determine the necessity of undertaking a full RI/FS: Should it be determined after the review that the presence of the gravel pit contributes to groundwater infiltration and flushing of contaminants through the gravel pit materials into the groundwater, the feasibility of closing and regrading the gravel pit area should be evaluated as part of the feasibility study.

CHAPTER 5

NARRATIVE

CHAPTER 5

FINAL APPLICATION OF HAZARD RANKING SYSTEM

5.1 NARRATIVE SUMMARY

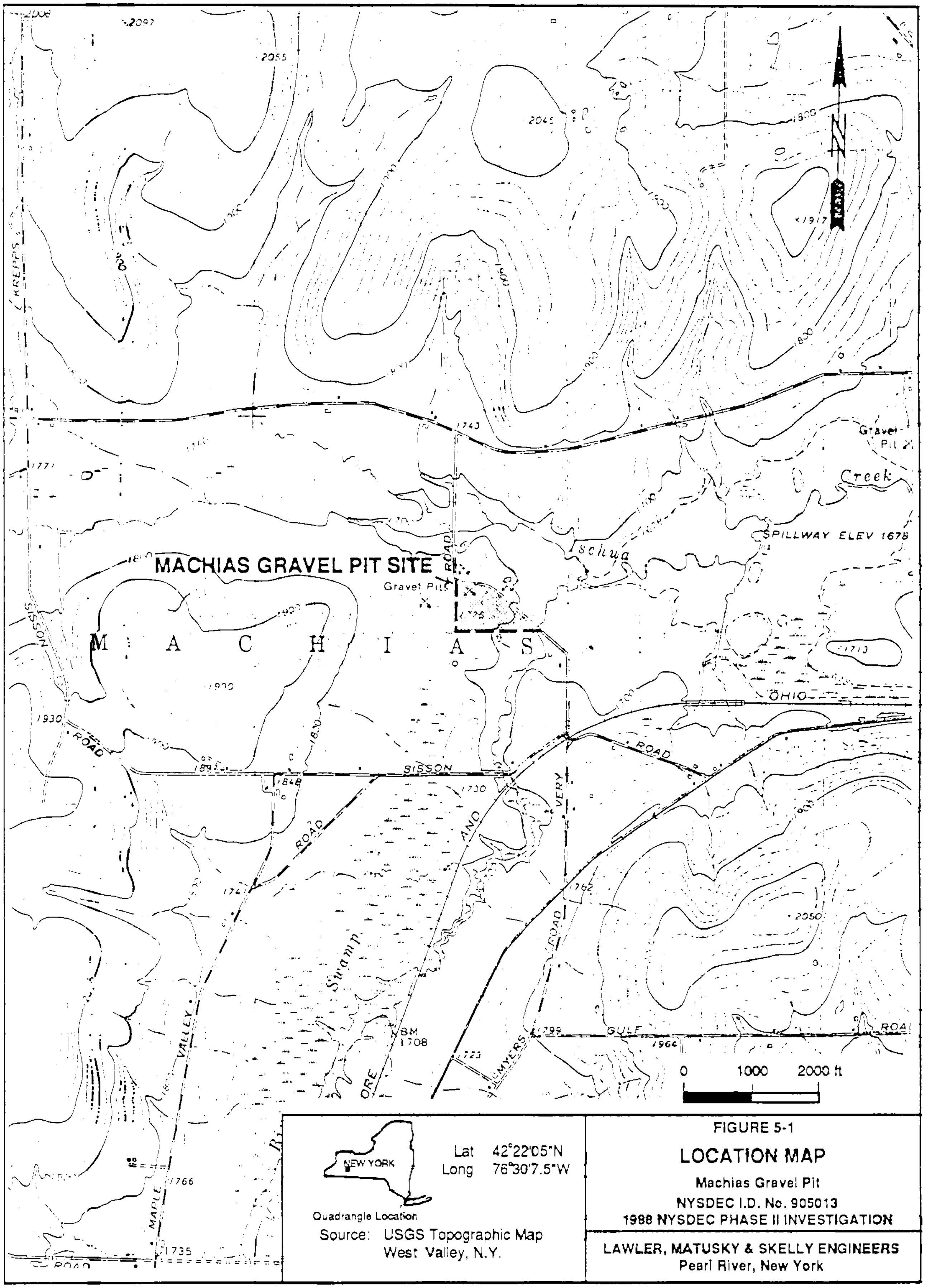
The Machias Gravel Pit site is made up of an active gravel pit, an inactive gravel pit, and densely vegetated, unused land area encompassing approximately 3.5 acres. The inactive gravel pit area was used to store approximately 600 drums of waste material from the Motorola Plant in nearby Arcade, New York. Most of the drums were present on site between March and September 1978; a small number remained for a longer period. The drums were suspected of containing epoxy resins, flammable and nonflammable solvents, and cutting oils. Spillage may have occurred when town personnel spread the oils on local roads to control dust. Drum contents were also released when some of the drums were used for target shooting. Another source of leakage was improper storage and drum decay. It was reported that half the drums were emptied. The oil received at the site was spread on local roads for dust control.

The site is located in an agricultural area of western New York, approximately 35 miles southeast of Buffalo. Approximately 1300 people within a 3-mile radius of the site use groundwater as their sole source of potable water. The nearest residence, approximately 500 ft south of the site, is served by two shallow potable wells.

Analysis of samples collected during the Phase II investigation showed that groundwater samples from GW-3 contained tetrachloroethane and 1,1,1-trichloroethane at 62 and 440 ug/l, respectively. Semivolatile compounds were present below the detection limit at GWR-1 and GWR-3. No contaminants were detected in the residential well.

LOCATION

5.2 LOCATION MAP



Lat 42°22'05"N
Long 76°30'7.5"W

Source: USGS Topographic Map
West Valley, N.Y.

FIGURE 5-1

LOCATION MAP

Machias Gravel Pit

NYSDEC I.D. No. 905013

1988 NYSDEC PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

HRS WORKSHEETS

5.3 HRS WORKSHEETS

HRS COVER SHEET

Facility Name: Town of Machias Gravel Pit

Location: Very Road, Town of Machias, Cattaraugus County

EPA Region: 2

Person(s) in charge of the facility: Town of Machias

Name of Reviewer: William C. Thayer   Date: 3 July 1989

General description of the facility:
(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action; etc.)

The Town of Machias gravel pit is an active sand and gravel quarry located on Very Road in the Town of Machias. Approximately 600 55-gallon drums of wastes including epoxy resins, acids, cutting oils, and flammable and non-flammable liquids generated by the Motorola Corporation of Arcade, New York, were transported to the Machias Gravel Pit. Analyses of groundwater samples collected from monitoring wells have detected 1,1,1-trichloroethane, carbo tetrachloride, and trichloroethene.

Scores: S_M= 37.16   (S_{GW}= 64.29 S_{SW}= 0 S_A= 0)

S_{FE}= not scored

S_{DC}= 12.50

GROUNDWATER ROUTE WORK SHEET

RATING FACTOR	ASSIGNED VALUE (circle one)	MULTIPLIER	SCORE	MAXIMUM SCORE	REFERENCE (section)
1 OBSERVED RELEASE	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4					
If observed release is given a score of 0, proceed to line 2					
2 ROUTE CHARACTERISTICS					3.2
Depth of Aquifer of Concern	0 1 (2) 3	2	4	6	
Net Precipitation	0 1 (2) 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 (2) 3	1	2	3	
Physical State	0 1 2 (3)	1	3	3	
	Total Route Characteristics Score		11	15	
3 CONTAINMENT	0 1 2 (3)	1	3	3	3.3
4 WASTE CHARACTERISTICS					3.4
Toxicity/Persistance	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 (3) 4 5 6 7 8	1	3	8	
	Total Waste Characteristics Score		21	26	
5 TARGETS					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 (30) 32 35 40	1	30	40	
			39	49	
6 If line 1 is 45, multiply 1 X 4 X 5			36,855		
If line 1 is 0, multiply 2 X 3 X 4 X 5				57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 64.29		

SURFACE WATER ROUTE WORK SHEET

RATING FACTOR	ASSIGNED VALUE (circle one)	MULTIPLIER	SCORE	MAXIMUM SCORE	REFERENCE (section)
1 OBSERVED RELEASE	0 45	1	0	45	4.1
If observed release is given a value of 45, proceed to line 4					
If observed release is given a value of 0, proceed to line 2					
2 ROUTE CHARACTERISTICS					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr 24-hr Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	(0) 1 2 3	2	0	6	
Physical State	0 1 2 (3)	1	3	3	
	Total Route Characteristics Score		5	15	
3 CONTAINMENT	(0) 1 2 3	1	0	3	4.3
4 WASTE CHARACTERISTICS					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 (3) 4 5 6 7 8	1	3	8	
	Total Waste Characteristics Score		21	26	
5 TARGETS					4.5
Surface Water Use	0 1 2 3	3	6	9	
Distance to a Sensitive Environment	0 1 2 3	2	2	6	
Population Served/ Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
	Total Targets Score		8	55	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			0	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 0		

AIR ROUTE WORK SHEET

RATING FACTOR	ASSIGNED VALUE (circle one)	MULTIPLIER	SCORE	MAXIMUM SCORE	REFERENCE (section)
1 OBSERVED RELEASE	(0) 45	1	0	45	5.1
DATE AND LOCATION:					
SAMPLING PROTOCOL:					
If line 1 is 0, then Sa = 0. Enter on line 5 If line 1 is 45, then proceed to line 2					
2 WASTE CHARACTERISTICS					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 TARGETS					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 X 2 X 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100		$S_A =$ 0			

FIRE AND EXPLOSION WORK SHEET

RATING FACTOR	ASSIGNED VALUE (circle one)	MULTIPLIER	SCORE	MAXIMUM SCORE	REFERENCE (section)
1 CONTAINMENT	1 3	1		3	7.1
2 WASTE CHARACTERISTICS					7.2
Direct Evidence	0 3	1		3	
Ignitability	0 1 2 3	1		3	
Reactivity	0 1 2 3	1		3	
Incompatibility	0 1 2 3	1		3	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 TARGETS					7.3
Distance to Nearest Population	0 1 2 3 4 5	1		5	
Distance to Nearest Building	0 1 2 3	1		3	
Distance to Sensitive Environment	0 1 2 3	1		3	
Land Use	0 1 2 3	1		3	
Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
	Total Target Score			24	
4 Multiply 1 X 2 X 3				1,440	
5 Divide line 4 by 1,440 and multiply by 100		S_{FE} = not scored			

DIRECT CONTACT WORK SHEET

RATING FACTOR	ASSIGNED VALUE (circle one)	MULTIPLIER	SCORE	MAXIMUM SCORE	REFERENCE (section)
1 OBSERVED INCIDENT	(0) 45	1	0	45	8.1
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2 ACCESSIBILITY	0 1 2 (3)	1	3	3	8.2
3 CONTAINMENT	0 (15)	1	15	15	8.3
4 WASTE CHARACTERISTICS TOXICITY	0 1 2 (3)	5	15	15	8.4
5 TARGETS					8.5
Population Within a 1-Mile Radius	0 (1) 2 3 4 5	4	4	20	
Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
	Total Targets Score		4	32	
6 If line 1 is 45, multiply 1 X 4 X 5 If line 1 is 0, multiply 2 X 3 X 4 X 5			2,700	21,600	
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	12.50		

WORKSHEET FOR COMPUTING S_M

	S	S^2
GROUNDWATER ROUTE SCORE (S_{GW})	64.29	4133.20
SURFACE WATER ROUTE SCORE (S_{SW})	0	0
AIR ROUTE SCORE (S_A)	0	0
$S^2_{GW} + S^2_{SW} + S^2_A$		4133.20
$\sqrt{S^2_{GW} + S^2_{SW} + S^2_A}$		64.29
$\sqrt{S^2_{GW} + S^2_{SW} + S^2_A}$ / 1.73 (S_M)		37.16

HRS DOCUMENTATION RECORDS

5.4 DOCUMENTATION RECORDS

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Machias Gravel Pit

LOCATION: Very Road, Machias, New York, Cattaraugus County

DATE SCORED: 3 July 1989

PERSON SCORING: William C. Thayer

PRIMARY SOURCE(S) OF INFORMATION (e.g., EPA region, state, FIT, etc.):

NYSDEC Region 9 Files
LMS Phase II Investigation

FACTORS NOT SCORED DUE TO INSUFFICIENT INFORMATION:

S_{FE} - No direct field evidence for a threat. No certification by a state or local fire marshal for the site as a fire or explosion threat was found.

COMMENTS OR QUALIFICATIONS:

None

GROUNDWATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

1,1,1-trichloroethane
Trichloroethene
1,1-dichloroethene
Aluminum
Chromium
Ref. 1

Rationale for attributing the contaminants to the facility:

COMPOUND	UPGRADIENT GW-1	DOWNGRADIENT GW-3
1,1,1-trichloroethane	ND	440
Trichloroethene	ND	62
1,1-dichloroethene	ND	11

All values are in ppb

Ref. 1
Assigned Value = 45

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

Glacial and glaciofluvial deposits of sand and gravel with some silt and clay
Refs. 2 and 3

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

41 ft
Ref. 3

Depth from the ground surface to the lowest point of waste disposal/storage:

0 ft. Approximately half of the drums leaked or were emptied onto the ground surface.
Ref. 2

Depth from lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern (subtract the above figures):

41 ft - 0 ft. In the 21 to 75 ft category.
Assigned Value = 2

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

38 in.
Ref. 4

Mean annual lake or seasonal evaporation (list months for seasonal):

27 in.
Ref. 4

Net precipitation (subtract the above figures):

11 in.
In the 5-15 in. category.
Assigned value = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Chenango (8-15% slope) gravelly silt loam.
Refs. 2 and 5

Permeability associated with soil type:

10^{-3} to 10^{-5} cm/s
In the $<10^{-3}-10^{-5}$ cm/sec category.
Ref. 5
Assigned Value = 2

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

At the time of disposal, liquids were stored in 55-gal drums; spillage occurred.
Ref. 2
Assigned Value = 3

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

Containers; approximately half of the 600 drums had holes in them, were severely corroded, or were emptied onto the ground surface.
Ref. 2

Method with highest score:

Containers; leaking and no liner present
Assigned Value = 3

* * *

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

1,1,1-trichloroethane
1,1-dichloroethene
Heptachlor epoxide
4,4'-DDD
4,4'-DDE
Refs. 1 and 6

Compound with highest score:

SUBSTANCE	PERSISTENCE/TOXICITY VALUE
4,4'-DDD	18
4,4'-DDE	18
1,1,1-trichloroethane	12
1,1-dichloroethene	15
Heptachlor epoxide	18

Heptachlor epoxide was used for scoring purposes.
Ref. 7

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (give a reasonable estimate even if quantity is above maximum):

300 55-gal drums were spilled/leaked onto the ground surface.
In the 251-500 drum range
Ref. 2
Assigned Value = 3

Basis of estimating and/or computing waste quantity:

Estimated quantity of liquid wastes that were spilled or leaked onto the ground surface
Ref. 2

* * *

5 TARGETS

Groundwater Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

The aquifer of concern (glacially deposited tills and sand and gravels) is the source of potable water within 3 miles of the site.
Refs. 2 and 8

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Location of nearest well is southeast of the site.
Ref. 2

Distance to above well or building:

500 ft
In the less than 2000-ft category
Ref. 2
Assigned Value = 4

Population Served by Groundwater Wells Within a 3-Mile Radius

Identified watersupply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

Village of Machias: approx. 722 people
Lazy B Ranch: 45 people
= 767 people total.
The total population within a 3-mile radius is 2656 people.
2656 - 767 = 1889 people assumed to draw drinking water from private wells.
1889 ÷ 3.8 = 497 private wells

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Land is not irrigated in the region.
Ref. 8

Total population served by groundwater within a 3-mile radius:

I.D. No.	WELL OWNER(S)	No. OF WELLS	POPULATION SERVED/WELL	POPULATION SERVED
15	Machias Village	3	-	722
50	Lazy B Ranch	1	45	45
-	Private wells	497	3.8	1889
			TOTAL POPULATION	2656

In the 1001-3000 category
Refs. 8, 9, 10
Assigned Value = 3
Matrix Value = 30

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

No surface water analyses were conducted.
Assigned Value = 0

Rationale for attributing the contaminants to the facility:

N/A

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

5%
In the 3-5% category
Ref. 11

Name/description of nearest downslope surface water:

Ischua Creek - Class C water body; not used as a source of drinking water at present.
Refs. 1, 11, and 12

Average slope of terrain between facility and above-cited surface water body in percent:

Intervening terrain precludes runoff from reaching surface water. Site is gravel pit.
Matrix Value = 0
Ref. 11

Is the facility located either totally or partially in surface water?

No
Refs. 2 and 11

Is the facility completely surrounded by areas of higher elevation?

Yes
Ref. 11

<u>One-Year 24-Hour Rainfall in Inches</u>

2.25 in.
In the 2.1 to 3.0 in. category
Ref. 13
Assigned Value = 2

<u>Distance to Nearest Downslope Surface Water</u>

Intervening terrain precludes runoff from reaching surface water.
Ref. 11
Assigned Value = 0

<u>Physical State of Waste</u>

Liquid wastes were dumped/spilled onto the ground surface.
Ref. 2
Assigned Value = 3

* * *

3 CONTAINMENT

Method(s) of waste or leachate containment evaluated:

Containment: Approximately 300 55-gal drums had leaked or were emptied onto the ground surface.
Ref. 2

Method with highest score:

Intervening terrain precludes runoff from reaching surface water.
Assigned Value = 0

* * *

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

1,1,1-trichloroethane	4,4'-DDD
1,1-dichloroethene	4,4'-DDE
Heptachlor epoxide	Aluminum
Refs. 1 and 6	Chromium

Compound with highest score:

SUBSTANCE	PERSISTENCE/TOXICITY VALUE
4,4'-DDD	18
4,4'-DDE	18
1,1,1-trichloroethane	12
1,1-dichloroethene	15
Heptachlor epoxide	18

Heptachlor epoxide was used for scoring purposes.
Ref. 7

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (give a reasonable estimate even if quantity is above maximum):

300 55-gal drums
In the 251-500 drum range
Refs. 2 and 14
Assigned Value = 3

Basis of estimating and/or computing waste quantity:

Estimated quantity of liquid wastes that were spilled or leaked onto the ground surface.
Refs. 2 and 14

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Ischua Creek is regulated as a Class C stream within 3 miles of the site. However, surface water is currently used for recreational purposes but not as a source of potable water.
Refs. 8, 9, and 12
Assigned Value = 2

Is there tidal influence?

No

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Greater than 2 miles.
In the >2 mile category.
Ref. 15

Distance to 5-acre (minimum) freshwater wetland, if 1 mile or less:

Bird Swamp 3000 ft to the south.
In the 1/4 to 1 mile category.
Ref. 15
Assigned Value = 1

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

>1 mile

Population Served by Surface Water

Location(s) of water supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

Population within 3 miles does not use surface water for potable sources.
Refs. 8 and 9
Matrix Value = 0

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

Land not irrigated
Ref. 8

Total population served:

Total population served = 0
Refs. 8 and 9

Name/description of nearest of above water bodies:

Ischua Creek tributary, a Class A water body not used for drinking purposes at present
Ref. 12

Distance to above-cited intakes, measured in stream miles:

N/A

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

LMS site visit on 11 August 1988 did not detect the presence of any air contaminants.
Therefore, $S_A = 0$
Ref. 16

Date and location of detection of contaminants:

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A

Most incompatible pair of compounds:

N/A

Toxicity

Most toxic compound:

N/A

Hazardous Waste Quantity

Total quantity of hazardous waste:

N/A

Basis of estimating and/or computing waste quantity:

N/A

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi	0 to 1 mi	0 to 1/2 mi	0 to 1/4 mi
N/A			

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) freshwater wetland, if 1 mile or less:

N/A

Distance to critical habitat of an endangered species, if 1 mile or less:

N/A

Land Use

Distance to commercial/industrial area, if 1 mile or less:

N/A

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/A

Distance to residential area, if 2 miles or less:

N/A

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/A

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within view of the site?

N/A

FIRE AND EXPLOSION

1 CONTAINMENT

Hazardous substances present:

Site not declared a fire or explosion hazard by a state or local fire marshall; therefore, this section will not be scored.

Type of containment, if applicable:

N/A

* * *

2 WASTE CHARACTERISTICS

Direct Evidence

Type of instrument and measurements:

N/A

Ignitability

Compound used:

N/A

Reactivity

Most reactive compound:

N/A

Incompatibility

Most incompatible pair of compounds:

N/A

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility:

N/A

Basis of estimating and/or computing waste quantity:

N/A

* * *

3 TARGETS

Distance to Nearest Population

N/A

Distance to Nearest Building

N/A

Distance to Sensitive Environment

Distance to wetlands:

N/A

Distance to critical habitat:

N/A

Land Use

Distance to commercial/industrial area, if 1 mile or less:

N/A

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/A

Distance to residential area, if 2 miles or less:

N/A

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/A

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within view of the site?

N/A

Population Within 2-Mile Radius

N/A

Buildings Within 2-Mile Radius

N/A

DIRECT CONTACT

1 OBSERVED INCIDENT

Date, location, and pertinent details of incident:

No documented history of illness or death to animals or humans has been identified.
Assigned Value = 0

* * *

2 ACCESSIBILITY

Describe type of barrier(s):

There are no barriers at this site. Site is easily accessible to the public.
Refs. 2 and 16
Assigned Value = 3

* * *

3 CONTAINMENT

Type of containment, if applicable:

Punctured and corroded drums had leaked hazardous wastes onto the ground surface; contents of some drums were emptied onto the ground surface.
Ref. 2
Assigned Value = 15

* * *

4 WASTE CHARACTERISTICS

Toxicity

Compounds evaluated:

1,1,1-trichloroethane
Trichloroethene
4,4'-DDD
4,4'-DDE
1,1-dichloroethene
Refs. 1 and 6

Compound with highest score:

All of the above have toxicity values = 3.
Ref. 7
Assigned Value = 3

* * *

5 TARGETS

Population Within 1-Mile Radius

19 homes within 1 mile x 3.8 persons per home = 72.
In the 1-100 category.
Ref. 10
Assigned Value = 1

Distance to Critical Habitat (of endangered species)

No federally listed endangered species are within 3 miles of the site. However, it should be noted that four New York State listed threatened species are within 3 miles of the site: the creeping sedge, lake-cress, Schweinitz sedge, and inland poor fen.
Ref. 17
Assigned Value = 0

HRS REFERENCES

5.5 HRS REFERENCES

HRS REFERENCES

[1] Tables 4-1 and 4-2 (this report).

[2] Satterthwaite, Walter B. Associates, Inc. 1985. Draft report on groundwater monitoring at the Machias gravel pit (Appendix I, this report).

[3] LMS. 1988. Subsurface boring logs (Appendix H, this report).

[4] U.S. Department of Commerce. 1979. Climatic Atlas of the United States. National Climatic Center, Asheville, NC. 2 pp.

[5] Recra Research, Inc. 1983. Phase I report (p. 5). (Appendix I, this report).

[6] Recra Environmental Laboratories. 1985. Lab report on drum samples (Appendix J, this report).

[7] Sax, N.I., and R.J. Lewis, Sr. 1989. Dangerous Properties of Industrial Materials. New York: Van Nostrand Reinhold Company Inc. pp. 134-135, 482-483, 911, 1151-1152, 1841-1842, 3327, 3329-3330.

[8] LMS. 1989. LMS memorandum of phone conversation with C. Janson of the Machias Water District. 1 p.

[9] NYSDOH. 1982. NYS Atlas of Community Water System Sources. 3 pp.

[10] House count.

[11] USGS. 1964. West Valley, New York Quadrangle Map (Ref. 5, Appendix A, this report).

[12] State of New York Official Compilation of Codes, Rules and Regulations (Ref. 4, Appendix A, this report).

[13] Hershfield, D.M. Rainfall Frequency Atlas of the United States - Technical Paper No. 40. U.S. Department of Commerce. 2 pp.

[14] NYSDEC. Inactive Hazardous Waste Disposal Report.

[15] USGS. 1964. West Valley, New York Quadrangle Wetlands Map (Ref. 3, Appendix A, this report).

[16] LMS. 1988. Site reconnaissance notes (Appendix B, this report).

[17] Rare species list from the Natural Heritage Database Report.

REFERENCE 1

TABLE 4-1

MAY 1989 WATER DATA SUMMARY

Machias Site NYSDEC I.D. No. 905013

PARAMETER	GWR-1	GWR-2	GWR-3	GWR-4	HW-1	PWR-1	CWR-1	FIELD BLANK	GWR-2MS	GWR-2MSD	GWR-1MS	GWR-1MSD
VOLATILE ORGANICS												
Methylene chloride	ND	ND	ND	1 bj	2 bj	1 bj	2 bj	ND	ND	1j	NR	NR
1,1-Dichloroethene	ND	ND	11 j	ND	ND	ND	ND	ND	ND	ND	NR	NR
1,1,1-Trichloroethane	ND	ND	440	ND	ND	ND	ND	ND	ND	ND	NR	NR
Trichloroethene	ND	ND	62	ND	ND	ND	ND	ND	ND	ND	NR	NR
Tentatively Identified Compounds												
1,2,2-Trichloro-1,2,2-ethane	ND	ND	190 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
SEMIVOLATILES												
Phenol	ND	3 j	7 j	ND	ND	ND	ND	ND	NR	NR	ND	ND
Bis(2-ethylhexyl)phthalate	4 j	ND	ND	ND	ND	ND	ND	ND	NR	NR	9 j	23
Di-n-octyl-phthalate	ND	ND	7 j	ND	ND	ND	ND	ND	NR	NR	ND	ND
Tentatively Identified Compounds												
4,4'-Butylidenebis(3-methyl-6-tert-butyl-phenol)	74 j	ND	20 j	46 j	ND	12 j	ND	ND	NR	NR	NR	NR
1-Methyl-2-pyrrolidinone	ND	48 j	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
Unknown	ND	ND	88 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
Unknown carboxylic acid	ND	ND	16 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,2-Benzene dicarboxylic acid	ND	ND	8 j	ND	ND	ND	ND	ND	NR	NR	NR	NR
PESTICIDES/PCBs												
None detected	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR

All data in ug/l.

HW - Cole house well.
CW - Cole cabin well.
PW - Potable well in field.

b - Found in method blank.
j - Estimated concentration; compound present below method detection limit.
ND - Not detected at analytical detection limit; see Appendix J for detection limit.
NR - Not run.

TABLE 4-2

MAY 1989 WATER DATA SUMMARY

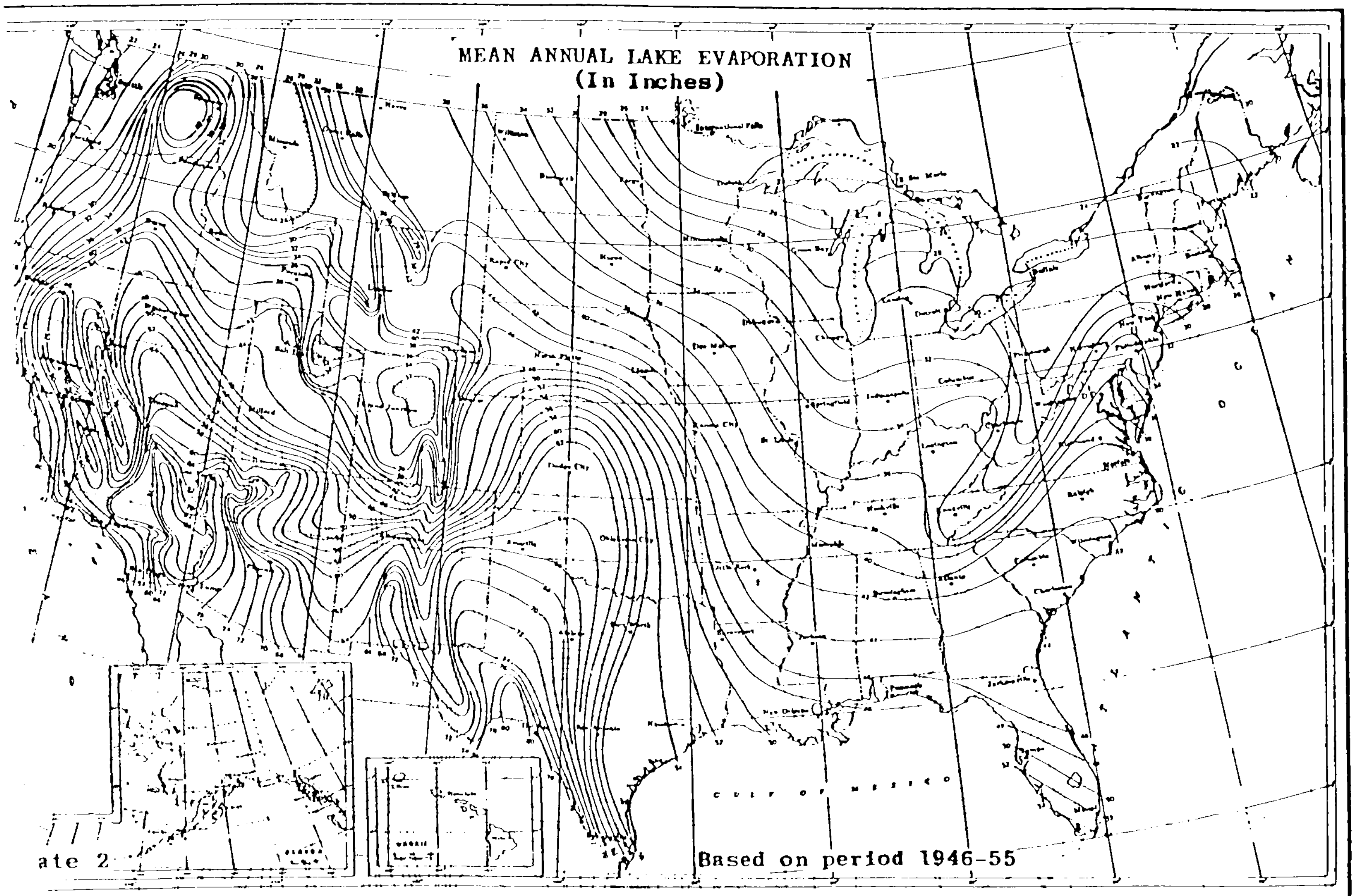
Machias Site NYSDEC I.D. No. 905013

METER	CWR-1	FIELD BLANK	GWR-1	GWR-2	GWR-3	GWR-4	HW-1	PWR-1	6 NYCRR PART 703.5 GW STANDARDS
METALS (ug/l)									
Aluminum	ND	31.8 B	30200	4380	8970	8960	ND	218	NS
Antimony	ND	ND	33.1 B	ND	ND	ND	ND	ND	NS
Arsenic	ND	ND N	15.8 B W	4.4 B W	6.8 B	6.9 B W	ND	ND	25
Barium	375	ND	373	186 B	150 B	101 B	140 B	89.2 B	1000
Beryllium	ND	ND	1.7 B	ND	1.2 B	1.5 B	ND	ND	NS
Cadmium	ND	ND	ND	ND	4.8 B	ND	ND	ND	10
Calcium	60700	88.5 B	227000	75100	146000	100000	100000	28900	NS
Chromium	ND	ND	96.2	29.3	14.9	20.2	ND	ND	50 (a)
Cobalt	ND	ND	36.4 B	9.9 B	11.7 B	10.9 B	ND	ND	NS
Copper	ND	ND	195	120	89.9	38.2	ND	ND	1000
Iron	1050	12.3 B	88600	11700	24200	21300	9.9 B	7770	300 (b)
Lead	ND	ND	57.3	14.0	23.3	10.4	1.3 B	1.4 B	25
Magnesium	9230 E	ND	55800	17600	33400	18500	20300 E	5630 E	NS
Manganese	101	1.6 B	2060	1630	595	524	ND	308	300 (b)
Mercury	ND N	ND N	ND N	ND N	ND N	ND N	ND N	ND N	2
Nickel	ND	ND	94.5	42.4	29.1 B	32.8 B	ND	ND	NS
Potassium	ND	ND	14700	4760 B	2480 B	3300 B	ND	ND	NS
Sodium	3170 B	ND	8430	22700	6130	16400	15000	11100	NS
Vanadium	ND	ND	55.3	9.8 B	17.5 B	15.4 B	ND	ND	NS
Zinc	5.3 B	18.2 B	542	209	268	134	7.0 B	520	5000
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	NS
SPECIFIC CONDUCTANCE (umhos/cm)	410	4.8	710	490	750	530	660	220	NS

HW - Cole house well.
CW - Cole cabin well.
PW - Potable well in field.
B - Value is less than the contract-required detection limit but greater than the instrument detection limit.
E - Value estimated due to interference.
ND - Not detected at analytical detection limit, see Appendix J for detection limit.

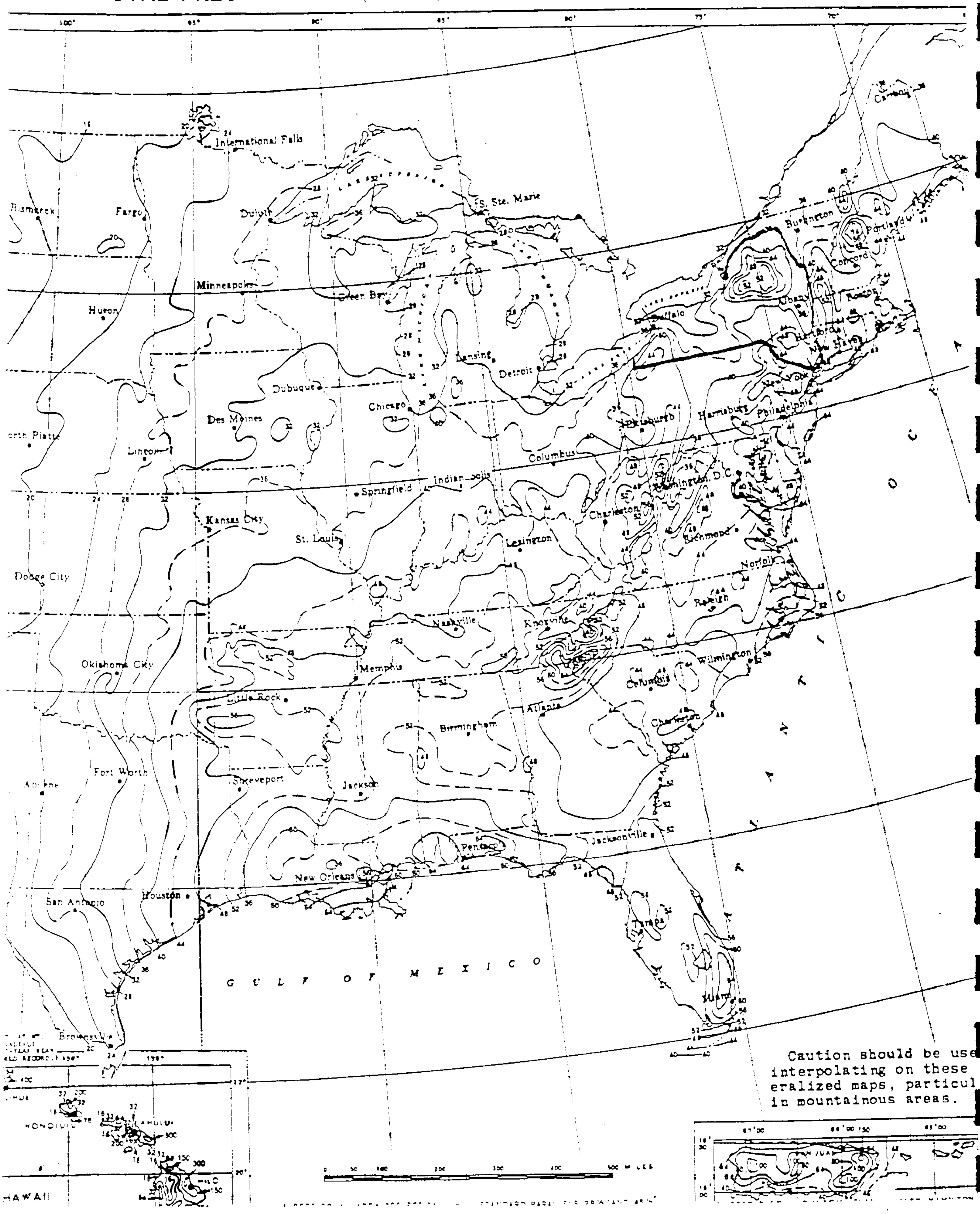
N - Spiked sample recovery is not within control limits.
NS - No standard.
W - Post-digestion spike out of control limits; sample absorbance is less than 50% of spike absorbance.
(a) - Hexavalent standard.
(b) - Combined standard not to exceed 500 ug/l.

REFERENCE 4



Source: Climatic Atlas of the United States, U.S. Department of Commerce National Climatic Center, Ashville, N.C. 1979

NNUAL TOTAL PRECIPITATION (Inches)



Caution should be use
interpolating on these
eralized maps, particul
in mountainous areas.

REFERENCE 7

DANGEROUS PROPERTIES of INDUSTRIAL MATERIALS

Seventh Edition

N. Irving Sax

Richard J. Lewis, Sr.

THR: Human reproductive effects by ingestion: changes in male fertility. When heated to decomposition it emits toxic fumes of NH_3 and NO_x.

AGX000 *HR: 3*
ALUMINUM
CAS: 7429-90-5 NIOSH: BD 0330000
DOT: 1309/1383/1396
af: Al aw: 26.98

PROP: A silvery ductile metal. Mp: 660°, bp: 2450°, d: 2.702, vap press 1 mm @ 1284°. Sol in HCl, H_2SO_4 and alkalies.

SYNS:

A 00
ADIM
ALAUN (GERMAN)
ALUMINA FIBRE
ALUMINUM FLAKE
ALUMINUM DEHYDRATED
ALUMINUM, METALLIC, POWDER (DOT)
ALUMINUM POWDER
ALUMINUM POWDER, UNCOATED, NON-PYROPHORIC (DOT)
C.I. 77000
EMANAY ATOMIZED ALUMINUM POWDER
JISC 3108
JISC 3110
METANA ALUMINUM PASTE
NORAL INK GRADE ALUMINUM
PAP-1

Community Right To Know List (fume or dust). Reported in EPA TSCA Inventory.

ACGIH TLV: (Metal and oxide) TWA 10 mg/m^3 (dust); (pyro powders and welding fumes) TWA 5 mg/m^3; (soluble salts and alkyls) TWA 2 mg/m^3

DOT Classification: Label: Flammable Solid; Label: Spontaneously Combustible (pyrophoric); IMO: Flammable Solid; Label: Dangerous When Wet (non-pyrophoric)

THR: Aluminum is not generally regarded as an industrial poison. Inhalation of finely divided powder has been reported as a cause of pulmonary fibrosis. Aluminum in aerosols has been implicated in Alzheimers disease. It is a reactive metal and the greatest industrial hazards are with chemical reactions. As with other metals the powder and dust are the most dangerous forms. Dust is moderately flammable/explosive by heat, flame, or chemical reaction with powerful oxidizers. To fight fire, use special mixtures of dry chemical.

Powdered aluminum undergoes the following dangerous interactions: explosive reaction after a delay period with $KClO_4$ + $Ba(NO_3)_2$ + KNO_3 + H_2O; also with $Ba(NO_3)_2$ + KNO_3 + sulfur + vegetable adhesives + H_2O. Mixtures with powdered AgCl; NH_4NO_3 or NH_4NO_3 + $Ca(NO_3)_2$ + formamide + H_2O are powerful explosives. Mixture with ammonium peroxodisulfate + water is explosive. Violent or explosive 'thermite' reaction when heated with metal oxides; oxosalts (nitrates, sulfates); or sulfides; and with hot copper oxide worked with an iron or steel tool. Potentially explosive reaction with CCl_4 during ball milling operations. Many violent or explosive reactions with the following halocarbons have occurred in industry: bromomethane; bromotrifluoromethane; CCl_4; chlorodifluoromethane; chloroform; chloromethane; chloromethane + 2-methylpropane; dichlorodifluoromethane; 1,2-dichloroethane; dichloromethane; 1,2-dichloropropane; 1,2-difluorotetrafluoroethane; fluorotrichloroethane; hexachloroethane + alcohol; polytrifluoroethylene oils and greases; tetrachloroethylene; tetrafluoromethane; 1,1,1-trichloroethane; trichloroethylene; 1,1,2-trichlorotrifluoroethane; and trichlorotrifluoroethane-dichlorobenzene. Potentially explosive reaction with chloroform amidinium nitrate. Ignites on contact with vapors of $AsCl_3$; SCl_2; Se_2Cl_2; and PCl_5. Reacts violently on heating with Sb or As. Ignites on heating in $SbCl_3$ vapor. Ignites on contact with barium peroxide. Potentially violent reaction with sodium acetylide. Mixture with sodium peroxide may ignite or react violently. Spontontaneously ignites in CS_2 vapor. Halogens: ignites in chlorine gas, foil reacts vigorously with liquid Br_2, violent reaction with H_2O + I_2. Violent reaction with hydrochloric acid; hydrofluoric acid; and hydrogen chloride gas. Violent reaction with disulfur dibromide. Violent reaction with the nonmetals phosphorus; sulfur; and selenium. Violent reaction or ignition with the interhalogens: bromine pentafluoride; chlorine fluoride; iodine chloride; iodine pentafluoride; and iodine heptafluoride. Burns when heated in CO_2. Ignites on contact with O_2 and mixtures with O_2 + H_2O ignite and react violently. Mixture with picric acid + water ignites after a delay period. Explosive reaction above 800°C with sodium sulfate. Violent reaction with sulfur when heated. Exothermic reaction with iron powder + water releases explosive hydrogen gas.

Aluminum powder also forms sensitive explosive mixtures with oxidants such as: liquid Cl_2 and other halogens; N_2O_4; tetranitromethane; bromates; iodates; $NaClO_3$; $KClO_3$; and other chlorates; $NaNO_3$; aqueous nitrates; $KClO_4$ and other perchlorate salts; nitryl fluoride; ammonium peroxodisulfate; sodium peroxide; zinc peroxide; and other peroxides; red phosphorus; and powdered polytetrafluoroethylene (PTFE).

Bulk aluminum may undergo the following dangerous interactions: exothermic reaction with butanol; methanol; 2-propanol; or other alcohols; sodium hydroxide to release explosive hydrogen gas. Reaction with diborane forms pyrophoric product. Ignition on contact with niobium oxide + sulfur. Explosive reaction with molten metal oxides; oxosalts (nitrates, sulfates); sulfides; and sodium carbonate. Reaction with arsenic trioxide + sodium arsenate + sodium hydroxide produces the toxic arsine gas. Violent reaction with chlorine trifluoride. Incandescent reaction with formic acid. Potentially violent alloy formation with palladium, platinum at mp of Al, 600°C. Vigorous dissolution reaction in methanol + carbon tetrachloride. Vigorous amalgamation reaction with mercury (II) salts + moisture. Violent reaction with molten silicon steels. Violent exothermic reaction above 600°C with sodium diuranate. For further information, see Vol. 4, No. 5 of *DPIM Report*.

AGX125 *HR: 3*
ALUMINUM ACEGLUTAMIDE
CAS: 12607-92-0 NIOSH: BD 1280000
mf: $C_{35}H_{59}Al_3N_{10}O_{24}$ mw: 471.29

SYNS:
ACEGLUTAMIDE ALUMINUM
N-ACETYL-L-GLUTAMINE ALUMINUM SALT
GLUMAL
KW 110
PENTAKIS(N(2)-ACETYL-L-GLUTAMINATO)TETRAHYDROXYTRIALUMINUM

TOXICITY DATA:	CODEN:
orl-rat TDLo:18 g/kg (90D male):REP	KSRNAM 8,923,74
orl-rat TDLo:36 g/kg (25W pre): REP	KSRNAM 8,923,74
ipr-rat LD50:4200 mg/kg	USXXAM #3787466
ivn-rat LD50:400 mg/kg	USXXAM #3787466
orl-mus LD50:13100 mg/kg	NYKZAU 68,602,72
ipr-mus LD50:5 g/kg	USXXAM #3787466
ivn-mus LD50:460 mg/kg	USXXAM #3787466

THR: Poison by intravenous route. Moderately toxic by some other routes. Experimental reproductive effects. When heated to decomposition it emits toxic fumes of NO_x. See also ALUMINUM COMPOUNDS.

AGX250 *HR: 1*
ALUMINUM AMMONIUM SULFATE
mf: $Al_2(SO_4)_3(NH_4)_2SO_4 \cdot 24H_2O$ mw: 906

PROP: Colorless crystals, odorless; sol in water, glycerin; insol in alc. D: 1.645, mp: 94.5°, bp: loses 20 H_2O @ 120°.
THR: A mild astringent used as a general-purpose food additive. Irritating if inhaled or ingested. Upon decomposition it emtis toxic fumes of NO_x and SO_x. See also ALUMINUM COMPOUNDS and SULFATES.

AGX300 *HR: 3*
ALUMINUM AZIDE
CAS: 39108-14-0
mf: AlN_9 mw: 153.04

THR: Shock sensitive explosive. When heated to decomposition it emits toxic fumes of NO_x. See also AZIDES and ALUMINUM COMPOUNDS.

AGX500 *HR: 3*
ALUMINUM BOROHYDRIDE
mf: AlB_3H_{12} mw: 71.53

PROP: Liquid. Bp: 44.5°, mp: −64.5°, vap press: 400 mm @ 28.1°.

SYN: ALUMINUM TETRAHYDROBORATE

THR: See HYDRIDES and BORON COMPOUNDS. Dangerous by spontaneous chemical reaction; ignites spontaneously in air, particularly in moist air. Explodes in O_2 at a temperature as low as 20°. An explosive range of 5% to 90%. Incompatible with water; steam; oxidizing materials; acid; acid fumes; will react with water or steam to produce heat, H_2, or toxic fumes. To fight fire, use CO_2, dry chemical.

AGX750 *HR: 2*
ALUMINUM BROMIDE
CAS: 7727-15-3 NIOSH: BD 0350000
DOT: 1725/2580
mf: $AlBr_3$ mw: 266.71

PROP: White to yellow-red lumps. Mp: 97.5°, bp: 263.3° @ 748 mm, d: 3.2, vap press: 1 mm @ 81.3°.

SYNS:
ALUMINUM BROMIDE (ANHYDROUS)
ALUMINUM BROMIDE SOLUTION (DOT)
ALUMINUM TRIBROMIDE
TRIBROMOALUMINUM

Reported in EPA TSCA Inventory.

ACGIH TLV: TWA 2 mg(Al)/m^3

DOT Classification: Label: Corrosive

THR: A toxic, corrosive material. See also BROMIDES and ALUMINUM COMPOUNDS. Mixtures with sodium or potassium explode violently upon impact. When heated to decomposition it emits toxic fumes of Br^-. Do not add H_2O to anhydrous material. Hydrolysis can be violent.

AGY000 *HR: 2*
ALUMINUM BROMIDE HYDROXIDE
CAS: 12794-92-2 NIOSH: BD 0360000

SYNS:
AL BROMOHYDRATE
ALUMINUM BROMHYDROXIDE
ALUMINUM BROMOHYDROL
ALUMINUM HYDROXYBROMIDE

TOXICITY DATA:	CODEN:
skn-hmn 90 mg/3D-I MLD	85DKA8 -,127,77

ACGIH TLV: TWA 2 mg(Al)/m^3

THR: A human skin irritant. See also BROMIDES. When heated to decomposition it emits toxic fumes of Br^-.

AGY250 *HR: 2*
ALUMINUM CARBIDE
mf: Al_4C_3 mw: 143.91

PROP: Yellow crystals or powder, hygroscopic. Mp: 2100°, bp: decomp @ 2200°, d: 2.36.
THR: Decomposed by water. Mixture with lead dioxide or potassium permanganate reacts incandescently when

TOXICITY DATA:	CODEN:
ipr-mus TDLo:40 mg/kg/I:NEO	JNCIAM 54,495,75
ipr-mus LDLo:250 mg/kg	StoGD# 27May75

Reported in EPA TSCA Inventory.

THR: An experimental neoplastigen. Poison by intraperitoneal route. When heated to decomposition it emits very toxic fumes of Cl^- and NO_x.

BIL500 *HR: 3*

BIS(p-CHLOROPHENYL)ACETIC ACID

CAS: 83-05-6 NIOSH: AF 5475000

mf: $C_{14}H_{10}Cl_2O_2$ mw: 281.14

SYNS:

BIS(4-CHLOROPHENYL)ACETIC ACID
BIS(p-CHLORPHENYL)ES-SIGSAEURE (GERMAN)
DICHLORODIPHENYLACETIC ACID
p,p'-DICHLORODIPHENYLACETIC ACID
DI(p-CHLOROPHENYL)ACETIC ACID

TOXICITY DATA:	CODEN:
sln-dmg-orl 3700 μmol/L	MUREAV 16,157,72
ipr-mus TDLo:2400 mg/kg/8W-I:NEO	CNREA8 33,3069,73
orl-mus LD50:590 mg/kg	AIPTAK 73,128,46

THR: Moderately toxic by ingestion. An experimental neoplastigen. Mutagenic data. When heated to decomposition it emits toxic fumes of Cl^-.

BIM000 *HR: 3*

O,O-BIS(p-CHLOROPHENYL)ACETIMIDOYL-PHOSPHORAMIDOTHIOATE

CAS: 4104-14-7 NIOSH: TB 4725000

mf: $C_{14}H_{13}Cl_2N_2O_2PS$ mw: 375.22

SYNS:

BAY 33819
BAYER 38819
DRC-714
GOPHACIDE
PHOSAZETIM

TOXICITY DATA:	CODEN:
orl-rat LD50:3700 μg/kg	FMCHA2 -,C117,83
skn-rat LD50:25 mg/kg	FMCHA2 -,C117,83
ipr-rat LD50:3500 μg/kg	AIPTAK 169,108,67
orl-mus LD50:12 mg/kg	TXAPA9 25,42,73
ipr-mus LD50:5500 μg/kg	AIPTAK 169,108,67
orl-dog LD50:23 mg/kg	PCOC** -,107,66
orl-gpg LD50:20 mg/kg	AIPTAK 169,108,67
ipr-gpg LD50:14 mg/kg	AIPTAK 169,108,67
orl-pgn LD50:15 mg/kg	TXAPA9 21,315,72
orl-bwd LD50:4 mg/kg	TXAPA9 21,315,72

EPA Extremely Hazardous Substances List.

THR: Poison by ingestion, skin contact, and intraperitoneal routes. A pesticide. When heated to decomposition it emits very toxic fumes of SO_x, PO_x, Cl^- and NO_x. See also ESTERS.

BIM250 *HR: D*

1,6-BIS(5-(p-CHLOROPHENYL)BIGUANIDINO)HEXANE

CAS: 55-56-1 NIOSH: DU 1925000

mf: $C_{22}H_{30}Cl_2N_{10}$ mw: 505.52

SYNS:

1,6-BIS(p-CHLOROPHENYLDIGUANIDO)HEXANE
CHLORHEXIDIN (CZECH)
CHLORHEXIDINE
1,6-DI(4'-CHLOROPHENYLDIGUANIDO)HEXANE
1,1'-HEXAMETHYLENEBIS(5-(p-CHLOROPHENYL)BIGUANIDE
HIBITANE
NOLVASAN
ROTERSEPT
STERIDO

TOXICITY DATA:	CODEN:
skn-hmn 1500 μg/3D-I MLD	85DKA8 -,127,77
mma-sat 400 nmol/L	CBINA8 28,249,79
dnr-esc 7 μmol/disc	CBINA8 28,249,79
orl-rat TDLo:1500 mg/kg (30D male):REP	YACHDS 6,2599,78
orl-mus TDLo:1680 mg/kg (7D pre):REP	MEXPAG 10,361,64
orl-rat LD50:9200 mg/kg	YACHDS 6,2599,78
orl-mus LD50:9850 mg/kg	YACHDS 6,2599,78

THR: Mildly toxic by ingestion. Experimental reproductive effects. A human skin irritant. Mutagenic data. When heated to decomposition it emits very toxic fumes of Cl^- and NO_x.

BIM500 *HR: 3*

1,1-BIS(4-CHLOROPHENYL)-2,2-DICHLOROETHANE

CAS: 72-54-8 NIOSH: KI 0700000

DOT: 2761

mf: $C_{14}H_{10}Cl_4$ mw: 320.04

PROP: Crystalline solid. Mp: 110°, vap d: 11.

SYNS:

1,1-BIS(p-CHLOROPHENYL)-2,2-DICHLOROETHANE
2,2-BIS(p-CHLOROPHENYL)-1,1-DICHLOROETHANE
2,2-BIS(4-CHLOROPHENYL)-1,1-DICHLOROETHANE
DDD
p,p'-DDD
1,1-DICHLOOR-2,2-BIS(4-CHLOORFENYL)-ETHAAN (DUTCH)
1,1-DICHLOR-2,2-BIS(4-CHLORPHENYL)-AETHAN (GERMAN)
1,1-DICLORO-2,2-BIS(4-CLOROFENIL)-ETANO (ITALIAN)
1,1-DICHLORO-2,2-BIS(p-CHLOROPHENYL)ETHANE
1,1-DICHLORO-2,2-BIS(4-CHLOROPHENYL)-ETHANE (FRENCH)
1,1-DICHLORO-2,2-BIS(p-CHLOROPHENYL)ETHANE (DOT)
1,1-DICHLORO-2,2-BIS(PARA-CHLOROPHENYL)ETHANE (DOT)
1,1-DICHLORO-2,2-DI(4-CHLOROPHENYL)ETHANE
DICHLORODIPHENYL DICHLOROETHANE
p,p'-DICHLORODIPHENYLDICHLOROETHANE
DILENE
ENT 4,225
ME-1700
NCI-C00475
RCRA WASTE NUMBER U060
RHOTHANE
RHOTHANE D-3
ROTHANE
TDE
p,p'-TDE
TDE (DOT)
TETRACHLORODIPHENYLETHANE

TOXICITY DATA:	CODEN:
cyt-rat:oth 10 μg/L	34LXAP -,555,76
hma-mus/srm 1500 mg/kg	BIZNAT 91,311,72

otr-mus:emb 28400 nmol/L	JNCICAM 54,981,75
orl-rat TDLo:54 g/kg/78W-C:ETA	NCITR* NCI-CG-TR-131,78
orl-mus TDLo:39 g/kg/2Y-C:NEO	JNCIAM 52,883,74
orl-rat LD50:113 mg/kg	GUCHAZ 6,154,73
orl-mus LDLo:600 mg/kg	JPETAB 88,400,46
skn-rbt LD50:1200 mg/kg	AFDOAQ 16,3,52

IARC Cancer Review: Animal Sufficient Evidence IMEMDT 5,83,74. NCI Carcinogenesis Bioassay (feed); Clear Evidence: rat NCITR* NCI-CG-TR-131,78; No Evidence: mouse NCITR* NCI-CG-TR-131,78. EPA Genetic Toxicology Program.

DOT Classification: ORM-A; Label: None

THR: Poison by ingestion. Moderately toxic by skin contact. An experimental carcinogen, neoplastigen and tumorigen. Mutagenic data. An insecticide. When heated to decomposition it emits toxic fumes of Cl^-. See also DDT. For further information, see Vol. 5, No. 3 of *DPIM Report*.

BIM750 *HR: 3*

2,2-BIS(p-CHLOROPHENYL)-1,1-DICHLOROETHYLENE

CAS: 72-55-9 NIOSH: KV 9450000

mf: $C_{14}H_8Cl_4$ mw: 318.02

SYNS:
DDE
p,p'-DDE
DDT DEHYDROCHLORIDE
1,1-DICHLORO-2,2-BIS(p-CHLOROPHENYL)ETHYLENE
p,p'-DICHLORODIPHENYL DICHLOROETHYLENE
1,1'-DICHLOROETHENYLIDENE)BIS(4-CHLOROBENZENE)
NCI-C00555

TOXICITY DATA:	CODEN:
sln-dmg-orl 1 pph	ENMUDM 7,325,85
dnd-rat:lvr 300 µmol/L	SinJF# 26OCT82
cyt-rat:oth 10 µg/L	34LXAP -,555,76
msc-mus:lym 40 mg/L/4H	MUREAV 59,61,79
sli-ham:ovr 25 mg/L	MUREAV 136,137,84
ipr-rat TDLo:3500 µg/kg (7D pre):REP	ENDOAO 91,1095,72
orl-mus TDLo:9700 mg/kg/78W-C:CAR	NCITR* NCI-CG-TR-131,78
orl-ham TDLo:36 g/kg/86W-C	CNREA8 43,776,83
orl-mus TD:28 g/kg/80W-C:NEO	JNCIAM 52,883,74
orl-mus TD:17 g/kg/78W-C:CAR	NCITR* NCI-CG-TR-131,79
orl-ham TD :57 g/kg/68W-C	CNREA8 43,776,83
orl-ham TD :41 g/kg/97W-C	CNREA8 43,776,83
orl-ham TD :81 g/kg/97W-C	CNREA8 43,776,83
orl-rat LD50:880 mg/kg	TXAPA9 14,515,69
orl-mus LDLo:200 mg/kg	JPETAB 88,400,46

IARC Cancer Review: Animal Limited Evidence IMEMDT 5,83,74. NCI Carcinogenesis Bioassay (feed); Clear Evidence: mouse NCITR* NCI-CG-TR-131,78; No Evidence: rat NCITR* NCI-CG-TR-131,78. EPA Genetic Toxicology Program.

THR: Poison by ingestion. An experimental carcinogen and neoplastigen. Experimental reproductive effects. Mutagenic data. An insecticide. When heated to decomposition it emits very toxic fumes of Cl^-. See also CHLORINATED HYDROCARBONS, ALIPHATIC.

BIN000 *HR: 2*

1,1-BIS(p-CHLOROPHENYL)METHYLCARBINOL

CAS: 80-06-8 NIOSH: DC 7875000

mf: $C_{14}H_{12}Cl_2O$ mw: 267.16

SYNS:
BCPE
1,1-BIS(p-CHLOROPHENYL)ETHANOL
1,1-BIS(4-CHLOROPHENYL)ETHANOL
BIS(p-CHLOROPHENYL)METHYL CARBINOL
1,1-BIS(4-CHLORPHENYL)-AETHANOL (GERMAN)
CHLORFENETHOL
DCPC
DCPE
DICHLORODIPHENYLETHANOL
p,p'-DICHLORODIPHENYLMETHYLCARBINOL
4,4'-DICHLORO(METHYL BENZHYDROL)
4,4'-DICHLORO-α-METHYLBENZHYDROL
4,4'-DICHLORO-α-METHYLBENZOHYDROL
DI-(p-CHLOROPHENYL)ETHANOL
DI(p-CHLOROPHENYL) METHYLCARBINOL
DIMITE
DMC
ENT 9,624
QIKRON

TOXICITY DATA:	CODEN:
orl-rat LD50:500 mg/kg	ARSIM* 20,8,66
ipr-rat LD50:725 mg/kg	OYYAA2 2,148,68

THR: Moderately toxic by ingestion and intraperitoneal routes. A pesticide. When heated to decomposition it emits toxic fumes of Cl^-.

BIN500 *HR: 2*

1,1-BIS(p-CHLOROPHENYL)-2-NITROPROPANE

CAS: 117-27-1 NIOSH: TX 3675000

mf: $C_{15}H_{13}Cl_2NO_2$ mw: 310.19

SYNS:
C.I. AZOIC DIAZO COMPONENT 37
CS 645A
DNP
ENT 22,784
2-NITRO-1,1-BIS(p-CHLOROPHENYL)PROPANE
1,1'-(2-NITROPORPYLIDENE)BIS(4-CHLOROBENZENE)
PROLAN
PROLAN (CSC)

TOXICITY DATA:	CODEN:
orl-rat LD50:750 mg/kg	MEIEDD 10,946,83

NIOSH REL: (Glycidyl Ethers) CL 5 mg/m^3/15M

THR: Moderately toxic by ingestion. An insecticide. When heated to decomposition it emits very toxic fumes of Cl^- and NO_x. See also AROMATIC AMINES.

BIN750 *HR: 1*

BIS(p-CHLOROPHENYL)SULFONE

CAS: 80-07-9 NIOSH: WR 3450000

mf: $C_{12}H_8Cl_2O_2S$ mw: 287.16

TOXICITY DATA:	CODEN:
orl-mus LD50:24 g/kg	HCACAV 29,1317,46

THR: An experimental carcinogen and neoplastigen. Very powerful oxidizer. See also CHROMIUM COMPOUNDS.

CMI500 *HR: 3*
CHROMITE (MINERAL)
CAS: 1308-31-2 NIOSH: GB 4000000
mf: Cr_2FeO_4 mw: 223.85

SYNS:
CHROME ORE
CHROMITE
CHROMITE ORE
IRON CHROMITE

TOXICITY DATA:	CODEN:
mma-sat 2 mg/plate	CRNGDP 3,1331,82
cyt-hmn:oth 500 mg/L	BJCAAI 44,219,81
dni-ham:kdy 500 mg/L	BJCAAI 44,219,81
oms-ham:kdy 500 mg/L	BJCAAI 44,219,81
cyt-ham:ovr 5 mg/L	BJCAAI 44,219,81
sce-ham:ovr 10 mg/L	CRNGDP 3,1331,82

IARC Cancer Review: Animal Inadequate Evidence IMEMDT 23,205,80. Chromium and its compounds are on the Community Right To Know List.

OSHA PEL: CL 0.5 mg(Cr)/m^3
ACGIH TLV: TWA 0.05 mg/m^3 (ore processing); Human Carcinogen (ore processing)

THR: A human carcinogen. Human mutagenic data. See also CHROMIUM COMPOUNDS and IRON.

CMI750 *HR: 3*
CHROMIUM
CAS: 7440-47-3 NIOSH: GB 4200000
mf: Cr mw: 52.00

SYN: CHROME

TOXICITY DATA:	CODEN:
ivn-rat TDLo:2160 µg/kg/6W-I: ETA	JNCIAM 16,447,55
imp-rat TDLo:1200 µg/kg/6W-I: ETA	JNCIAM 16,447,55
imp-rbt TDLo:75 mg/kg:ETA	ZEKBAI 52,425,42
orl-hmn LDLo:71 mg/kg:GIT	34ZIAG -,176,69

IARC Cancer Review: Animal Inadequate Evidence IMEMDT 23,205,80. Reported in EPA TSCA Inventory. Chromium and its compounds are on the Community Right To Know List.

OSHA PEL: TWA 1 mg/m^3
ACGIH TLV: TWA 0.5 mg/m^3

THR: Human poison by ingestion with gastrointestinal effects. An experimental tumorigen and suspected carcinogen. Powder will explode spontaneously in air. Ignites and is potentially explosive in atmospheres of carbon dioxide. Violent or explosive reaction when heated with ammonium nitrate. May ignite or react violently with bromine pentafluoride. Incandescent reaction with nitrogen oxide; sulfur dioxide. Incompatible with oxidants. See also CHROMIUM COMPOUNDS. For further information, see Vol. 3, No. 3 of *DPIM Report*.

CMJ000 *HR: 3*
CHROMIUM ACETATE HYDRATE
CAS: 628-52-4 NIOSH: AG 3000000
mf: $C_4H_6O_4 \cdot Cr \cdot H_2O$ mw: 188.12

PROP: Red crystals.

SYNS:
ACETIC ACID, CHROMIUM (2+) SALT (8CI, 9CI)
CHROMIUM(2+) ACETATE
CHROMIUM(II) ACETATE
CHROMIUM DIACETATE
CHROMOUS ACETATE
CHROMOUS ACETATE MONOHYDRATE

TOXICITY DATA:	CODEN:
orl-rat LD50:11260 mg/kg	AIHAAP 30,470,69

Reported in EPA TSCA Inventory. Chromium and its compounds are on the Community Right To Know List.

OSHA PEL: CL 0.5 mg(Cr)/m^3
ACGIH TLV: TWA 0.5 mg(Cr)/m^3

THR: Mildly toxic by ingestion. The anhydrous acetate ignites spontaneously in air. See also CHROMIUM COMPOUNDS. When heated to decomposition it emits acrid smoke and irritating fumes.

CMJ250 *HR: 3*
CHROMIUM CHLORIDE
CAS: 10025-73-7 NIOSH: GB 5425000
mf: Cl_3Cr mw: 158.35

PROP: Bp: 1300° (subl).

SYNS:
CHROMIC CHLORIDE
CHROMIUM(III) CHLORIDE (1:3)
CHROMIUM CHLORIDE, ANHYDROUS
CHROMIUM TRICHLORIDE
C.I. 77295
PURATRONIC CHROMIUM CHLORIDE
TRICHLOROCHROMIUM

TOXICITY DATA:	CODEN:
pic-esc 500 µmol/L	ENMDUM 6,59,84
cyt-hmn:oth 500 mg/L	BJCAAI 44,219,81
dnd-rat-ipr 80 mg/kg	CNREA8 45,1146,85
dni-mus:fbr 300 µmol/L	JTEHD6 15,237,85
sce-ham:lng 39 mg/L	CRNGDP 4,605,83
ipr-mus TDLo:44600 µg/kg (8D preg):TER	JTSCDR 1,1,76
ipr-mus TDLo:59500 µg/kg (9D preg):REP	JTSCDR 1,1,76
scu-mus TDLo:450 mg/kg (1-17D preg):TER	TJADAB 12,198,75
skn-rat LDLo:2 g/kg	85GMAT -,39,82
ihl-mus LC50:31500 µg/m^3/2H	85GMAT -,39,82
ipr-mus LD50:434 mg/kg	COREAF 256,1043,63
scu-mus LDLo:800 mg/kg	AQMOAC #70-15,70
ivn-mus LDLo:400 mg/kg	AQMOAC #70-15,70
ivn-mus LD50:40 mg/kg	85GMAT -,39,82
skn-rbt LDLo:1 g/kg	85GMAT -,39,82

DFH600 *HR: 2*

O,O-DI(2-CHLOROETHYL)-O-(3-CHLORO-4-METHYLCOUMARIN-7-YL) PHOSPHATE

CAS: 321-55-1 NIOSH: GN 5250000

mf: $C_{14}H_{14}Cl_3O_6P$ mw: 415.60

SYNS:

O,O-BIS(2-CHLOROETHYL)-O-(3-CHLORO-4-METHYL-7-COUMARINYL) PHOSPHATE
2-CHLOROETHANOL HYDROGEN PHOSPHATE ESTER with 3-CHLORO-7-HYDROXY-4-METHYLCOUMARIN
2-CHLOROETHANOL PHOSPHATE DIESTER ESTER with 3-CHLORO-7-HYDROXY-4-METHYLCOUMARIN
3-CHLORO-7-HYDROXY-4-METHYLCOUMARIN BIS(2-CHLOROETHYL) PHOSPHATE
3-CHLORO-4-METHYL-UMBELLIFERONE BIS(2-CHLOROETHYL) PHOSPHATE
DI-(2-CHLOROETHYL)-3-CHLORO-4-METHYL-7-COUMARINYL PHOSPHATE
DI-(2-CHLOROETHYL)-3-CHLORO-4-METHYLCOUMARIN-7-YL PHOSPHATE
EUSTIDIL
GALLOXON
GALOXANE
961160
HALOXON
HELMIRANE
HELMIRON
HELMIRONE
LOXON
LUXON
LXON

TOXICITY DATA:	CODEN:
dni-hmn:oth 10 mg/L	JTEHD6 10,143,82
orl-rat LD50:900 mg/kg	FAZMAE 17,108,73
ipr-ckn LD50:800 mg/kg	BCPCA6 16,1183,67
orl-dom LD50:763 mg/kg	AJVRAH 41,1857,80

THR: Moderately toxic by ingestion and intraperitoneal routes. Human mutagenic data. An anthelmintic. When heated to decomposition it emits very toxic fumes of PO_x and Cl^-. See also other coumarin entries.

DFH800 *HR: 2*

DICHLOROETHYLENE

CAS: 25323-30-2 NIOSH: KV 9250000

DOT: 1150

mf: $C_2H_2Cl_2$ mw: 96.94

TOXICITY DATA:	CODEN:
ihl-mus LCLo:76 g/m³/2H	AEXPBL 83,235,18
ihl-gpg LCLo:155 g/m³/1H	AEXPBL 83,235,18
orl-man LDLo:2500 mg/kg	UGLAAD 121,375,59

DOT Classification: Flammable Liquid; Label: Flammable Liquid

THR: Moderately toxic by ingestion. Mildly toxic by inhalation. Flammable when exposed to heat or flame. When heated to decomposition it emits toxic fumes of Cl^-. See also 1,1-DICHLOROETHYLENE.

DFI000 *HR: 3*

1,1-DICHLOROETHYLENE

CAS: 75-35-4 NIOSH: KV 9275000

mf: $C_2H_2Cl_2$ mw: 96.94

PROP: Colorless, volatile liquid. Bp: 31.6°, lel: 7.3%, uel: 16.0%, fp: −122°, flash p: 0°F (OC), d: 1.213 @ 20°/4°, autoign temp: 1058°F.

SYNS:

CHLORURE de VINYLIDENE (FRENCH)
1,1-DCE
1,1-DICHLOROETHENE
NCI-C54262
RCRA WASTE NUMBER U078
SCONATEX
VDC
VINYLIDENE CHLORIDE (II)
VINYLIDENE CHLORIDE (ACGIH)
VINYLIDENE DICHLORIDE
VINYLIDINE CHLORIDE

TOXICITY DATA:	CODEN:
mmo-sat 5 pph	MUREAV 57,141,78
mma-sat 3 pph/2H	MUREAV 58,183,78
dnd-rat-ihl 10 ppm	TXAPA9 53,357,80
dns-mus-ihl 50 ppm	TXAPA9 53,357,80
dns-mus-orl 200 mg/kg	TXCYAC 36,199,85
orl-rat TDLo:200 mg/kg (6-15D preg):TER	TXAPA9 49,189,79
ihl-rat TCLo:80 ppm/7H (6-15D preg):TER	TXAPA9 49,189,79
ihl-rat TCLo:55 ppm/6H (55D pre):REP	JTEHD6 3,965,77
ihl-rat TCLo:55 ppm/6H/52W-I: ETA	JTEHD6 4,15,78
ihl-mus TCLo:25 ppm/4H/52W-I	MELAAD 68,241,77
skn-mus TDLo:4840 mg/kg: NEO	JJIND8 63,1433,79
ihl-rat TC:150 ppm/4H/52W-I: ETA	MELAAD 68,241,77
ihl-mus TC:55 ppm/6H/13W-I: ETA	JTEHD6 7,909,81
ihl-mus TC:55 ppm/6H/52W-I: ETA	EVHPAZ 21,25,77
ihl-rat TC:55 ppm/6H/52W-I: ETA	EVHPAZ 21,25,77
ihl-rat TC:150 ppm/4H/52W-I: ETA	EVHPAZ 21,45,77
ihl-rat TC:55 ppm/6H/28W-I: ETA	JTEHD6 7,909,81
ihl-hmn TCLo:25 ppm: CNS,LIV,KID	CHINAG (11),463,76
orl-rat LD50:200 mg/kg	DCTODJ 1,63,77
ihl-rat LCLo:10000 ppm/24H	EXMPA6 20,187,74
ihl-mus LC50:98 ppm/22H	JTEHD6 3,913,77
orl-dog LDLo:5750 mg/kg	QJPPAL 7,205,34
ivn-dog LDLo:225 mg/kg	QJPPAL 7,205,34
scu-rbt LDLo:3700 mg/kg	QJPPAL 7,205,34

IARC Cancer Review: Human Inadequate Evidence IMEMDT 39,195,86; Animal Sufficient Evidence IMEMDT 19,439,79; Animal Limited Evidence IMEMDT 39,195,86; Human Inadequate Evidence IMEMDT 19,439,79. EPA Genetic Toxicology Program. Reported in EPA TSCA Inventory. Community Right To Know List.

ACGIH TLV: TWA 5 ppm; STEL 20 ppm

THR: Poison by inhalation, ingestion and intravenous routes. Moderately toxic by subcutaneous route. An experimental carcinogen, neoplastigen, tumorigen and teratogen. Human systemic effects by inhalation: general anesthesia, liver and kidney changes. Experimental reproductive effects. Mutagenic data. See also VINYL CHLORIDE. A very dangerous fire hazard when exposed to heat or flame. Moderately explosive in the form of gas when exposed to heat or flame. It forms explosive peroxides upon exposure to air. Potentially explosive reaction with chlorotrifluoroethylene at 180°C. Reaction with ozone forms dangerous products. Explosive reaction with perchloryl fluoride when heated above 100°C. Also can explode spontaneously. Reacts violently with chlorosulfonic acid; HNO_3; oleum. Can react vigorously with oxidizing materials. To fight fire, use alcohol foam, CO_2, dry chemical. When heated to decomposition it emits toxic fumes of Cl^-.

DFI200 *HR: 1*

cis-DICHLOROETHYLENE

CAS: 156-59-2 NIOSH: KV 9420000

mf: $C_2H_2Cl_2$ mw: 96.94

HCCl=CHCl

PROP: Colorless liquid, pleasant odor. Mp: −80.5°, bp: 59°, lel: 9.7%, uel: 12.8%, flash p: 39°F, d: 1.2743 @ 25°/4°, vap press: 400 mm @ 41.0°, vap d: 3.34.

SYN: 1,2-DICHLOROETHYLENE

TOXICITY DATA:	CODEN:
mmo-smc 100 mmol/L	TCMUD8 4,365,84
mma-smc 40 mmol/L	TCMUD8 4,365,84
mrc-smc 100 mmol/L	TCMUD8 4,365,84
dns-rat:lvr 4300 μmol/L	CRNGDP 5,1629,84
ihl-mus LCLo:65000 mg/m³/2H	AHBAAM 116,131,36
ihl-cat LCLo:20000 mg/m³/6H	AHBAAM 116,131,36

Reported in EPA TSCA Inventory.

THR: Mildly toxic by by ingestion and inhalation. In high concentration it is irritating and narcotic. Has produced liver and kidney injury in experimental animals. A suspected carcinogen. Mutagenic data. Sometimes thought to be nonflammable, however, it is a dangerous fire hazard when exposed to heat or flame. Reaction with solid caustic alkalies or their concentrated solutions produces chloracetylene gas which ignites spontaneously in air. Reacts violently with N_2O_4; KOH; Na; NaOH. Moderate explosion hazard in the form of vapor when exposed to flame. Can react vigorously with oxidizing materials. To fight fire, use water spray, foam, CO_2, dry chemical. When heated to decomposition it emits toxic fumes of Cl^-. See also 1,1-DICHLOROETHYLENE and CHLORINATED HYDROCARBONS, ALIPHATIC. For further information, see Vol. 4, No. 3 of *DPIM Report*.

DFI600 *HR: 1*

trans-1,2-DICHLOROETHYLENE

CAS: 156-60-5 NIOSH: KV 9400000

mf: $C_2H_2Cl_2$ mw: 96.94

PROP: Flash p: 35.6°F, lel: 9.7%, uel: 12.8%.

SYN:
trans-ACETYLENE DICHLORIDE trans-DICHLOROETHYLENE

TOXICITY DATA:	CODEN:
ihl-hmn TCLo:4800 mg/m³/10M	AHBAAM 116,131,36
ipr-rat LD50:7536 mg/kg	TXCYAC 7,141,77
ihl-mus LCLo:75000 mg/m3/2H	AHBAAM 116,131,36
ipr-mus LD50:4019 mg/kg	TXCYAC 7,141,77
ihl-cat LCLo:43000 mg/m3/6H	AHBAAM 116,131,36

Reported in EPA TSCA Inventory.

THR: Mildly toxic to humans by inhalation. Mildly toxic experimentally by inhalation and intraperitoneal routes. A very dangerous fire hazard when exposed to heat or flame. Violent reaction with difluoromethylene dihypofluorite. Forms shock-sensitive explosive mixtures with dinitrogen tetraoxide. Reaction with solid caustic alkalies or their concentrated solutions produces chloracetylene gas which ignites spontaneously in air. Reacts violently with N_2O_4; KOH; Na; NaOH. Moderate explosion hazard in the form of vapor when exposed to flame. Can react vigorously with oxidizing materials. To fight fire, use water spray, foam, CO_2, dry chemical. When heated to decomposition it emits toxic fumes of Cl^-. See also 1,1-DICHLOROETHYLENE and CHLORINATED HYDROCARBONS, ALIPHATIC. For further information, see Vol. 4, No. 3 of *DPIM Report*.

DFI800 *HR: 3*

1,2-DICHLOROETHYLENE CARBONATE

CAS: 3967-55-3 NIOSH: JH 7400000

mf: $C_3H_2Cl_2O_3$ mw: 156.95

SYN: 4,5-DICHLORO-2-OXO-1,3-DIOXOLANE

TOXICITY DATA:	CODEN:
scu-mus TDLo:648 mg/kg/54W-I:ETA	JNCIAM 48,1431,72

THR: An experimental tumorigen. When heated to decomposition it emits toxic fumes of Cl^-.

DFJ000 *HR: 3*

DICHLORO(ETHYLENEDIAMMINE)PLATINUM(II)

CAS: 14096-51-6 NIOSH: TP 2497100

mf: $C_2H_8Cl_2N_2Pt$ mw: 326.11

SYNS:
ETHYLENEDIAMINEDICHLORIDE PLATINUM (II)
PLATINUM ETHYLENEDIAMMINE DICHLORIDE

TOXICITY DATA:	CODEN:
mmo-sat 2 μg/plate	MUREAV 77,45,80
mma-sat 2 μg/plate	MUREAV 77,45,80
dnd-esc 100 mmol/L	CBINA8 16,39,77
dni-hmn:oth 25 μmol/L	IJCNAW 6,207,70
oms-mam:lym 10 μmol/L	BCPCA6 23,1659,74
ipr-mus LDLo:14 mg/kg	BCPCA6 2,187,73

THR: Poison by intraperitoneal route. Human mutagenic data. See also PLATINUM COMPOUNDS. When heated to decomposition it emits very toxic fumes of Cl^- and NO_x.

Reported in EPA TSCA Inventory.

THR: A poison by subcutaneous, intraperitoneal, intravenous and possibly other routes. See also BROMIDES. When heated to decomposition it emits very toxic fumes of NO_x and Br^-.

HAQ100 *HR: 3*
HENBANE

PROP: Biennial or annual weeds which grow to about 2 feet and are covered with fine hairs. The leaves are about 8 inches long with toothed edges. The flowers range in color from green-yellow to yellow-white with a purple throat and veins. They are native to Europe but can be found in scrub lands in the northeastern United States and southern Canada, and in sandy prairie areas across the United States.

SYNS:
BELENO (MEXICO)
FETID NIGHTSHADE
HYOSCYAMUS NIGER
INSANE ROOT
JUSQUIAME (CANADA)
POISON TOBACCO
STINKING NIGHTSHADE

THR: The seed contains poisonous belladonna alkaloids. Ingestion of the seeds can result in increased heart rate, fever, vision impairment, delirium and hallucinations. See also BELLADONNA.

HAQ500 *HR: 2*
HEPARIN
CAS: 9005-49-6 NIOSH: MI 0700000

SYNS:
α-HEPARIN
HEPARINATE
HEPARINIC ACID
HEPARIN SULFATE
LIPO-HEPIN
LIQUAEMIN
LIQUEMIN
NOVOHEPARIN
SUBLINGULA
THROMBOLIQUINE
VETREN
VITAMIN AB
VITRUM AB

TOXICITY DATA:	CODEN:
dns-mus:lvr 33 mg/L	AMOKAG 33,149,79
dns-mus:oth 10 mg/L	JJIND8 71,615,83
dni-mus:ast 42 mg/L	AMOKAG 33,149,79
dni-mus:lvr 167 mg/L	AMOKAG 33,149,79
dnd-ham:ovr 200 mg/L	BBACAQ 517,486,78
orl-rat LD50:1950 mg/kg	GWXXBX #2636091
ipr-rat LDLo:420 mg/kg	TXAPA9 1,156,59
ivn-mus LD50:1500 mg/kg	AJMSA9 216,234,48

THR: Moderately toxic by ingestion, intraperitoneal, and intravenous routes. Mutagenic data. When heated to decomposition it emits toxic fumes of NO_x. See also HEPARIN SODIUM

HAQ550 *HR: 3*
HEPARIN SODIUM
CAS: 9041-08-1 NIOSH: MI 0850000

SYNS:
DEPO-HEPARIN
HED-HEPARIN
HEPATHROM
LIQUAEMIN SODIUM
LIQUEMIN
PK 10169
PULARIN
SODIUM ACID HEPARIN
SODIUM HEPARIN
SODIUM HEPARINATE

TOXICITY DATA:	CODEN:
scu-man TDLo:7 mg/kg/4D: CNS,SKN,BLD	JAMAAP 244,1831,80
ivn-rat LD50:354 mg/kg	DEBIDR 12,535,81
ivn-mus LD50:2800 mg/kg	JPETAB 102,156,51
ivn-dog LD50:1 g/kg	JPETAB 102,156,51

THR: Poison by intravenous route. Human systemic effects by subcutaneous route: hallucinations and distorted perceptions, hemorrhage and dermatitis. When heated to decomposition it emits toxic fumes of NO_x and Na_2O. See also HEPARIN.

HAR000 *HR: 3*
HEPTACHLOR
CAS: 76-44-8 NIOSH: PC 0700000
DOT: 2761
mf: $C_{10}H_5Cl_7$ mw: 373.30

PROP: Crystals, nearly insol in water; sol in organic solvents. Mp: 96°.

SYNS:
AGROCERES
3-CHLOROCHLORDENE
DRINOX
E 3314
ENT 15,152
EPTACLORO (ITALIAN)
1,4,5,6,7,8,8-EPTACLORO-3a,4,7,7a-TETRAIDRO-4,7-endo-METANO-INDENE (ITALIAN)
GPKh
H-34
HEPTACHLOOR (DUTCH)
1,4,5,6,7,8,8-HEPTACHLOOR-3a,4,7,7a-TETRAHYDRO-4,7-endo-METHANO-INDEEN (DUTCH)
HEPTACHLOR (ACGIH, DOT)
HEPTACHLORE (FRENCH)
3,4,5,6,7,8,8-HEPTACHLORODICYCLOPENTADIENE
3,4,5,6,7,8,8a-HEPTACHLORODICYCLOPENTADIENE
1,4,5,6,7,10,10-HEPTACHLORO-4,7,8,9,-TETRAHYDRO-4,7-ENDOMETHYLENEINDENE
1,4,5,6,7,8,8-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-ENDOMETHANOINDENE
1,4,5,6,7,8,8a-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-METHANOINDANE
1,4,5,6,7,8,8-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-METHANOINDENE
1(3a),4,5,6,7,8,8-HEPTACHLORO-3a(1),4,7,7a-TETRAHYDRO-4,7-METHANOINDENE
1,4,5,6,7,8,8-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-METHANOL-1H-INDENE
1,4,5,6,7,8,8-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-METHYLENE INDENE
1,4,5,6,7,10,10-HEPTACHLORO-4,7,8,9-TETRAHYDRO-4,7-METHYLENEINDENE
1,4,5,6,7,8,8-HEPTACHLOR-3a,4,7,7a-TETRAHYDRO-4,7-endo-METHANO-INDEN (GERMAN)
HEPTAGRAN
HEPTAMUL
NCI-C00180
RCRA WASTE NUMBER P059
RHODIACHLOR
VELSICOL 104

TOXICITY DATA:	CODEN:
mma-hmn:fbr 100 μmol/L	MUREAV 42,161,77
cyt-rat-orl 60 μg/kg	34LXAP -,555,76
dlt-rat-orl 60 μg/kg	34LXAP -,555,76
cyt-mus-ipr 5200 μg/kg	SOGEBZ 2,80,66

orl-mus TDLo:403 mg/kg/80W-C:CAR	NCITR* NCI-CG-TR-9,77
orl-mus TD :930 mg/kg/80W-C:CAR	NCITR* NCI-CG-TR-9,77
orl-rat LD50:40 mg/kg	PHJOAV 185,361,60
skn-rat LD50:119 mg/kg	SPEADM 78-1,12,78
ipr-rat LD50:27 mg/kg	FCTXAV 11,63,73
orl-mus LD50:68 mg/kg	SPEADM 78-1,12,78
ipr-mus LD50:130 mg/kg	SOGEBZ 2,80,66
ivn-mus LDLo:20 mg/kg	JPETAB 107,266,53
skn-rbt LD50:2000 mg/kg	AFDOAQ 16,3,52
orl-gpg LD50:116 mg/kg	PCOC** -,576,66
orl-ham LD50:100 mg/kg	EJTXAZ 7,159,74
unr-mam LD50:60 mg/kg	30ZDA9 -,59,71

IARC Cancer Review: Human Inadequate Evidence IMEMDT 20,129,79; Animal Inadequate Evidence IMEMDT 5,173,74; Animal Sufficient Evidence IMEMDT 20,129,79. NCI Carcinogenesis Bioassay (feed) Clear Evidence: Mouse (NCITR* NCI-CG-TR-9,77); Results negative: Rat (NCITR* NCI-CG-TR-9,77). EPA Genetic Toxicology Program. Community Right To Know List.

OSHA PEL: TWA 500 μg/m³ (skin)
ACGIH TLV: TWA 0.5 mg/m³ (skin)

DOT Classification: ORM-E; Label: None

THR: A poison by ingestion, skin contact, intraperitoneal, intravenous, and possibly other routes. An experimental carcinogen. Human mutagenic data. Acute exposure and chronic doses have caused liver damage. See also closely related chlordane. In man, a dose of 1-3 grams can cause serious symptoms, especially where liver impairment is the case. Acute symptoms include tremors, convulsions, kidney damage, respiratory collapse and death. Dangerous; when heated to decomposition it emits toxic fumes of Cl^-.

NOTE: The EPA has cancelled registration of pesticides containing heptachlor with the exception of its use by sub-surface ground insertion external to the dwelling for termite control. For further information, see Vol. 1, No. 8 of *DPIM Report*.

HAR500 *HR: 3*
HEPTACHLOR (TECHNICAL GRADE)
NIOSH: PC 0750000

PROP: Mixture of 73% heptachlor, 22% trans-chlordane, and 5% nonachlor (NCITR* NCI-CG-TR-9).

SYN: 1,4,5,6,7,8,8-HEPTACHLORO-3a,4,7,7a-TETRAHYDRO-4,7-METHANOINDENE (technical grade)

TOXICITY DATA:	CODEN:
orl-mus TDLo:410 mg/kg/80W-C:CAR	NCITR* NCI-CG-TR-9,77
orl-cat LD50:67 mg/kg	85GMAT -,71,82
skn-gpg LD50:627 mg/kg	85GMAT -,71,82
skn-rbt LD50:500 mg/kg	85GMAT -,71,82
orl-rat LD50:40 mg/kg	KSKZAN 16(2),59,78

THR: Poison by ingestion. Moderately toxic by skin contact. An experimental carcinogen. When heated to decomposition it emits toxic fumes of Cl^-. See also HEPTACHLOR.

HAS000 *HR: 2*
HEPTACOSAFLUOROTRIBUTYLAMINE
CAS: 311-89-7 NIOSH: EO 5820000
mf: $C_{12}F_{27}N$ mw: 671.13

SYN: 1,1,2,2,3,3,4,4,4-NONAFLUORO-N,N-BIS(NONAFLUOROBUTYL)-1-BUTANAMINE

TOXICITY DATA:	CODEN:
ipr-mus LDLo:512 mg/kg	CBCCT* 3,362,51

Reported in EPA TSCA Inventory.

THR: Moderately toxic by intraperitoneal route. When heated to decomposition it emits very toxic fumes of F^- and NO_x.

HAS500 *HR: 3*
HEPTADECANOIC ACID
CAS: 506-12-7 NIOSH: MI 3850000
mf: $C_{17}H_{34}O_2$ mw: 270.51

SYNS:
n-HEPTADECOIC ACID
n-HEPTADECYLIC ACID
MARGARIC ACID

TOXICITY DATA:	CODEN:
ivn-mus LD50:36 mg/kg	APTOA6 18,141,61

Reported in EPA TSCA Inventory.

THR: Poison by intravenous route. When heated to decomposition it emits acrid smoke and fumes.

HAT000 *HR: 1*
HEPTADECANOL (MIXED PRIMARY ISOMERS)
CAS: 52783-44-5 NIOSH: MI 3900000
mf: $C_{17}H_{36}O$ mw: 256.53

PROP: Mp: 54°, bp: 309°, flash p: 310°F (COC), d: 0.8475 @ 20°/20°, vap press: 0.01 mm @ 20°, vap d: 8.84.

TOXICITY DATA:	CODEN:
skn-rbt 8475 μg/24H open MLD	AIHAAP 23,95,62
orl-rat LD50:51600 mg/kg	AIHAAP 23,95,62
skn-rbt LD50:16800 mg/kg	AIHAAP 23,95,62

THR: Mildly toxic by ingestion and skin contact. A skin irritant. Combustible when exposed to heat or flame; can react with oxidizing materials. To fight fire, use CO_2, dry chemical. When heated to decomposition it emits acrid smoke and fumes.

HAT500 *HR: 2*
2-HEPTADECYL-2-IMIDAZOLINE-1-ETHANOL
CAS: 95-19-2 NIOSH: NJ 2985000
mf: $C_{22}H_{46}N_2O$ mw: 354.70

TIM000 *HR: 1*
1,1,2-TRICHLORO-2,2-DIFLUOROETHANE
CAS: 354-21-2 NIOSH: KI 1435000
mf: $CHCl_3F_2$ mw: 157.37

SYNS:
1,1-DIFLUORO-1,2,2-TRICHLOROETHANE
UCON FLUOROCARBON 122

TOXICITY DATA:	CODEN:
orl-rat LDLo:7500 mg/kg	HXPHAU 20(Pt 1),-459,66
ihl-rat LCLo:4000 ppm/4H	UCMH** 15NOV62

THR: Mildly toxic by ingestion and inhalation. When heated to decomposition it emits very toxic fumes of F^- and Cl^-. See also CHLORINATED HYDROCARBONS, ALIPHATIC and FLUORIDES.

TIM500 *HR: 1*
TRICHLORO ESTERTIN
NIOSH: WH 8240000

SYN: ESTERTRICHLOROSTANNANE

TOXICITY DATA:	CODEN:
unr-rat LD50:5500 mg/kg	TIUSAD 107,1,76

OSHA PEL: TWA 0.1 mg(Sn)/m^3
ACGIH TLV: TWA 0.1 mg(Sn)/m^3 (skin)
NIOSH REL: (Organotin Compounds) TWA 0.1 mg(Sn)/m^3

THR: When heated to decomposition it emits toxic fumes of Cl^-. See also TIN COMPOUNDS and ESTERS.

TIM750 *HR: 3*
1,1,1-TRICHLOROETHANE
CAS: 71-55-6 NIOSH: KJ 2975000
DOT: 2831
mf: $C_2H_3Cl_3$ mw: 133.40

PROP: Colorless liquid. Bp: 74.1°, fp: −32.5°, flash p: none, d: 1.3376 @ 20°/4°, vap press: 100 mm @ 20.0°. Insol in water; sol in acetone, benzene, carbon tetrachloride, methanol, ether.

SYNS:
AEROTHENE TT
CHLOROETENE
CHLOROETHENE
CHLOROTHANE NU
CHLOROTHENE
CHLOROTHENE (INHIBITED)
CHLOROTHENE NU
CHLOROTHENE VG
CHLORTEN
INHIBISOL
METHYLCHLOROFORM
METHYL CHLOROFORM (ACGIH, DOT)
METHYLTRICHLOROMETHANE
NCI-C04626
RCRA WASTE NUMBER U226
SOLVENT 111
STROBANE
α-T
1,1,1-TCE
1,1,1-TRICHLOOROETHAAN (DUTCH)
1,1,1-TRICHLORAETHAN (GERMAN)
TRICHLORO-1,1,1-ETHANE (FRENCH)
α-TRICHLOROETHANE
1,1,1-TRICLOROETANO (ITALIAN)
TRI-ETHANE

TOXICITY DATA:	CODEN:
eye-man 450 ppm/8H	BJIMAG 28,286,71
skn-rbt 5 g/12D-I MLD	AIHAAP 19,353,58
skn-rbt 500 mg/24H MOD	28ZPAK -,28,72
eye-rbt 100 mg MLD	AIHAAP 19,353,58
eye-rbt 2 mg/24H SEV	28ZPAK -,28,72
dnr-esc 500 mg/L	PMRSDJ 1,195,81
otr-mus:emb 20 mg/L	CALEDQ 28,85,85
orl-rat TDLo:43 mg/kg (1-22D preg/21D post):TER	TJADAB 29(2),25A,84
ihl-rat TCLo:2100 ppm/24H (14D pre/1-20D preg):TER	TOXID9 1,28,81
ihl-man LCLo:27 g/m^3/10M	JOCMA7 8,358,66
ihl-man TCLo:350 ppm:CNS	WEHSAL 10,82,73
orl-hmn TDLo:670 mg/kg:GIT	NTIS** PB257-185
ihl-hmn TCLo:920 ppm/70M: EYE,CNS	AIHAAP 19,353,58
ihl-man TCLo:200 ppm/4H:CNS	ATSUDG 5,96,82
orl-rat LD50:10300 mg/kg	NTIS** PB257-185
ihl-rat LC50:18000 ppm/4H	28ZPAK -,28,72
ipr-rat LD50:5100 mg/kg	NTIS** PB257-185
orl-mus LD50:11240 mg/kg	NTIS** PB257-185
ihl-mus LC50:3911 ppm/2H	SAIGBL 13,226,71
ipr-mus LD50:4700 mg/kg	TXAPA9 13,287,68
orl-dog LD50:750 mg/kg	FMCHA2 -,C242,83
ipr-dog LD50:3100 mg/kg	TXAPA9 10,119,67
ivn-dog LDLo:95 mg/kg	HBTXAC 5,72,59
ihl-cat LCLo:600 mg/m^3/4H	85GMAT -,38,82
orl-rbt LD50:5660 mg/kg	AIHAAP 19,353,58
skn-rbt LDLo:1 g/kg	85GMAT -,38,82
scu-rbt LDLo:500 mg/kg	HBTXAC 5,72,59
orl-gpg LD50:9470 mg/kg	AIHAAP 19,353,58

IARC Cancer Review: Animal Inadequate Evidence IMEMDT 20,515,79. NCI Carcinogenesis Bioassay (gavage); Inadequate Studies: mouse, rat NCITR* NCI-CG-TR-3,77. Community Right To Know List. Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program.

OSHA PEL: TWA 350 ppm
ACGIH TLV: TWA 350 ppm; STEL 450 ppm
DFG MAK: 200 ppm (2080 mg/m^3); BAT: blood 55 μg/dl
NIOSH REL: (1,1,1-Trichloroethane) CL 350 ppm/15M

DOT Classification: ORM-A; Label: None; Poison B; Label: St Andrews Cross

THR: Poison by intravenous route. Moderately toxic by ingestion, inhalation, skin contact, subcutaneous and intraperitoneal routes. An experimental teratogen. Human systemic effects by ingestion and inhalation: conjunctiva irritation, hallucinations or distorted perceptions, motor activity changes, irritability, aggression, hypermotility, diarrhea, nausea or vomiting and other gastrointestinal changes. Experimental reproductive effects. Mutagenic data. A human skin irritant. An experimental skin and severe eye irritant. Narcotic in high concentrations. Causes a proarrhythmic activity which sensitizes the heart to epinephrine-induced arrhythmias. This sometimes will cause cardiac arrest, particularly when this material is massively inhaled as in drug abuse for euphoria.

TOXICITY DATA:	CODEN:
skn-rbt 10 mg/24H open	AMIHBC 10,61,54
skn-rbt 625 mg open SEV	UCDS** 1/19/72
eye-rbt 50 µg open SEV	AMIHBC 10,61,54
orl-rat LD50:1280 mg/kg	AMIHBC 10,61,54
ihl-rat LCLo:500 ppm/4H	UCDS** 1/19/72
skn-rbt LD50:680 mg/kg	AMIHBC 10,61,54

Reported in EPA TSCA Inventory.

DOT Classification: Flammable Liquid; Label: Flammable Liquid, Corrosive

THR: Moderately toxic by ingestion, inhalation and skin contact. A severe eye and skin irritant. A corrosive irritant to skin, eyes and mucous membranes. A very dangerous fire hazard when exposed to heat or flame. Reacts violently with water; moist air or steam to produce toxic and corrosive fumes. When heated to decomposition it emits toxic fumes of Cl^-. See also CHLOROSILANES.

TIO000 *HR: 2*

2,2,2-TRICHLORO-1-ETHOXYETHANOL

CAS: 515-83-3 NIOSH: KM 4725000

mf: $C_4H_7Cl_3O_2$ mw: 193.46

PROP: Crystals. D: 1.143, mp: 47.5°, bp: 116°. Less sol in water than chloral hydrate; sol in organic solvents.

SYNS:
CHLORAL ALCOHOLATE
CHLORAL ETHYLALCOHOLATE
CHLORAL, ETHYL HEMIACETAL
TRICHLOROACETALDEHYDE MONOETHYLACETAL

TOXICITY DATA:	CODEN:
orl-rat LD50:880 mg/kg	JPETAB 78,340,43
orl-dog LDLo:1200 mg/kg	JPETAB 78,340,43
orl-cat LDLo:500 mg/kg	JPETAB 78,340,43
orl-rbt LDLo:1100 mg/kg	JPETAB 78,340,43

Reported in EPA TSCA Inventory.

THR: Moderately toxic by ingestion. When heated to decomposition it emits toxic fumes of Cl^-. See also ALDEHYDES.

TIO500 *HR: 3*

TRICHLOROETHYL CARBAMATE

CAS: 107-69-7 NIOSH: FD 1750000

mf: $C_3H_4Cl_3NO_2$ mw: 192.43

SYNS:
CARBAMIC ACID, 2,2,2-TRICHLOROETHYL ESTER
2,2,2-TRICHLOROETHANOL CARBAMATE
VOLUNTAL

TOXICITY DATA:	CODEN:
ipr-mus TDLo:3250 mg/kg/13W-I:NEO	JNCIAM 8,99,47
orl-mus LDLo:750 mg/kg	LDTU** -,-,31
ipr-mus LD50:500 mg/kg	JNCIAM 8,99,47

THR: Moderately toxic by ingestion and intraperitoneal routes. An experimental neoplastigen. When heated to decomposition it emits very toxic fumes of Cl^- and NO_x. See also ESTERS and CARBAMATES.

TIO750 *HR: 3*

TRICHLOROETHYLENE

CAS: 79-01-6 NIOSH: KX 4550000

DOT: 1710

mf: C_2HCl_3 mw: 131.38

PROP: Mobile liquid; characteristic odor of chloroform. D: 1.4649 @ 20°/4°, bp: 86.7°, flash p: 89.6°F, lel: 12.5%, uel: 90% @ > 30°, mp: −73°, fp: −86.8°, autoign temp: 788°F, vap press: 100 mm @ 32°, vap d: 4.53.

SYNS:
ACETYLENE TRICHLORIDE
ALGYLEN
ANAMENTH
BENZINOL
BLACOSOLV
CECOLENE
1-CHLORO-2,2-DICHLOROETHYLENE
CHLORYLEA
CHORYLEN
CIRCOSOLV
CRAWHASPOL
DENSINFLUAT
1,1-DICHLORO-2-CHLOROETHYLENE
DOW-TRI
DUKERON
ETHINYL TRICHLORIDE
ETHYLENE TRICHLORIDE
FLECK-FLIP
FLUATE
GERMALGENE
LANADIN
LETHURIN
NARCOGEN
NARKOSOID
NCI-C04546
NIALK
PERM-A-CHLOR
PETZINOL
RCRA WASTE NUMBER U228
THRETHYLENE
TRIAD
TRIASOL
TRICHLOORETHEEN (DUTCH)
TRICHLOORETHYLEEN, TRI (DUTCH)
TRICHLORAETHEN (GERMAN)
TRICHLORAETHYLEN, TRI (GERMAN)
TRICHLORAN
TRICHLORETHENE (FRENCH)
TRICHLORETHYLENE, TRI (FRENCH)
TRICHLOROETHENE
1,2,2-TRICHLOROETHYLENE
TRI-CLENE
TRICLORETENE (ITALIAN)
TRICLOROETILENE (ITALIAN)
TRIELINA (ITALIAN)
TRILENE
TRIMAR
TRI-PLUS
VESTROL
VITRAN
WESTROSOL

TOXICITY DATA:	CODEN:
skn-rbt 500 mg/24H SEV	28ZPAK -,28,72
eye-rbt 20 mg/24H MOD	28ZPAK -,28,72
mmo-asn 2500 ppm	MUREAV 155,105,85
sln-asn 17500 ppm	MUREAV 155,105,85
dns-rat:lvr 2800 µmol/L	CRNGDP 5,1629,84
otr-mus:emb 20 mg/L	CALEDQ 28,85,85
otr-ham:emb 5 mg/L	CRNGDP 4,291,83
orl-rat TDLo:2688 mg/kg (1-22D preg/21D post):REP	TOXID9 4,179,84
ihl-rat TCLo:1800 ppm/24H (1-2D preg):TER	APTOD9 19,A22,80
ihl-rat TCLo:100 ppm/4H (8-21D preg):TER	BJANAD 54,337,82
ihl-rat TCLo:150 ppm/7H/2Y-I:CAR	INHEAO 21,243,83
orl-mus TDLo:455 g/kg/78W-I:CAR	NCITR* NCI-CG-TR-2,76

ihl-mus TCLo:150 ppm/7H/2Y-I:CAR	INHEAD 21,243,83
ihl-ham TCLo:100 ppm/6H/77W-I:ETA	ARTODN 43,237,80
orl-mus TD :912 g/kg/78W-I:CAR	NCITR* NCI-CG-TR-2,76
ihl-mus TC:500 ppm/6H/77W-I:ETA	ARTODN 43,237,80
ihl-mus TC:150 ppm/7H/2Y-I:CAR	INHEAO 21,243,83
orl-man TDLo:2143 mg/kg:GIT	34ZIAG -,602,69
ihl-hmn TCLo:6900 mg/m³/10M:CNS	AHBAAM 116,131,36
ihl-hmn TCLo:160 ppm/83M:CNS	AIHAAP 23,167,62
ihl-hmn TDLo:812 mg/kg:CNS,GIT,LIV	BMJOAE 2,689,45
ihl-man TCLo:110 ppm/8H:EYE,CNS	BJIMAG 28,293,71
orl-hmn LDLo:7 g/kg	ARTODN 35,295,76
ihl-man LCLo:2900 ppm	NZMJAX 50,119,51
orl-rat LC50:3670 mg/kg	28ZPAK -,28,72
ihl-rat LCLo:8000 ppm/4H	AIHAAP 30,470,69
orl-mus LD50:2402 mg/kg	NTIS** AD-A080-636
ihl-mus LC50:8450 ppm/4H	APTOA6 9,303,53
ipr-mus LD50:3000 mg/kg	EJTXAZ 7,247,74
ivn-mus LD50:34 mg/kg	CBCCT* 6,141,54
ipr-dog LD50:1900 mg/kg	TXAPA9 10,119,67
scu-dog LDLo:150 mg/kg	HBTXAC 5,76,59
ivn-dog LDLo:150 mg/kg	QJPPAL 7,205,34
orl-cat LDLo:5864 mg/kg	NBTXAC 5,76,59
ihl-cat LCLo:32500 mg/m³/2H	AMBAAM 116,131,36
orl-rbt LDLo:7330 mg/kg	HBTXAC 5,76,59
scu-rbt LDLo:1800 mg/kg	QJPPAL 7,205,34
ihl-gpg LCLo:37200 ppm/40M	HBTXAC 5,76,59

IARC Cancer Review: Animal Limited Evidence IMEMDT 20,545,79; Human Inadequate Evidence IMEMDT 20,-545,79; Animal Sufficient Evidence IMEMDT 11,263,76. NCI Carcinogenesis Bioassay (gavage); No Evidence: rat NCITR* NCI-CG-TR-2,76; (gavage); Clear Evidence: mouse NCITR* NCI-CG-TR-2,76. Community Right To Know List. Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program.

OSHA PEL: TWA 100 ppm; Cl 1200; Pk 300/5M/2H
ACGIH TLV: TWA 50 ppm; STEL 200 ppm; BEI: trichloroethanol in urine end of shift 320 mg/g creatinine, trichloroethylene in end-exhaled air prior to shift and end of work week 0.5 ppm
DFG MAK: 50 ppm (260 mg/m³); BAT: blood end of work week and end of shift 500 µg/dl
NIOSH REL: (Trichloroethylene) TWA 250 ppm; (Waste Anesthetic Gases) CL 2 ppm/1H

DOT Classification: ORM-A; Label: None; Poison B; Label: St. Andrews Cross

THR: Experimental poison by intravenous and subcutaneous routes. Moderately toxic experimentally by ingestion and intraperitoneal routes. Mildly toxic to humans by ingestion and inhalation. Mildly toxic experimentally by inhalation. An experimental carcinogen, tumorigen and teratogen. Human systemic effects by ingestion and inhalation: eye effects, somnolence, hallucinations or distorted perceptions, gastrointestinal changes and jaundice. Experimental reproductive effects. Human mutagenic data. An eye and severe skin irritant. Inhalation of high concentrations causes narcosis and anesthesia. A form of addiction has been observed in exposed workers. Prolonged inhalation of moderate concentrations causes headache and drowsiness. Fatalities following severe, acute exposure have been attributed to ventricular fibrillation resulting in cardiac failure. There is damage to liver and other organs from chronic exposure. A common air contaminant.

A very dangerous fire hazard when exposed to heat or flame. Explosive in the form of vapor when exposed to heat or flame. High concentrations of trichloroethylene vapor in high-temperature air can be made to burn mildly if plied with a strong flame. Though such a condition is difficult to produce, flames or arcs should not be used in closed equipment which contains any solvent residue or vapor. Reacts with alkali; epoxides [e.g., 1-chloro-2,3-epoxypropane; 1,4-butanediol mono-2,3-epoxypropylether; 1,4-butanediol di-2,3-epoxypropylether; 2,2-bis((4(2',3'-epoxypropoxy)phenyl)propane] to form the spontaneously flammable gas dichloroacetylene. Can react violently with Al; Ba; N_2O_4; Li; Mg; liquid O_2; O_3; KOH; KNO_3; Na; NaOH; Ti. Reacts with water under heat and pressure to form HCl gas. When heated to decomposition it emits toxic fumes of Cl^-. Used as a vapor degreaser and in dry cleaning. See also CHLORINATED HYDROCARBONS, ALIPHATIC. For further information, see Vol. 3, No. 1 of *DPIM Report*.

TIP000 *HR: 2*
α-TRICHLOROETHYLIDENE GLYCEROL

NIOSH: JI 3380000

mf: $C_5H_7Cl_3O_3$ mw: 221.47

SYN: α-2-(TRICHLOROMETHYL)-1,3-DIOXOLANE-4-METHANOL

TOXICITY DATA:	CODEN:
ipr-mus LD50:920 mg/kg	JPETAB 81,72,44
ivn-mus LD50:520 mg/kg	JPETAB 81,72,44

THR: Moderately toxic by intraperitoneal and intravenous routes. When heated to decomposition it emits toxic fumes of Cl^-.

TIP250 *HR: 2*
β-TRICHLOROETHYLIDENE GLYCEROL

NIOSH: JI 3440000

mf: $C_5H_7Cl_3O_3$ mw: 221.47

SYN: β-2-(TRICHLOROMETHYL)-1,3-DIOXOLANE-4-METHANOL

TOXICITY DATA:	CODEN:
ipr-mus LD50:959 mg/kg	JPETAB 81,72,44
ivn-mus LD50:518 mg/kg	JPETAB 81,72,44

REFERENCE 8

Lawler, Matusky & Skelly Engineers

Environmental Science & Engineering Consultants

One Blue Hill Plaza

Pearl River, New York 10965

MEMORANDUM OF CONVERSATION

JOB Machias JOB No. 576-011

DATE 20 April 1989 TIME 1345

THE WRITER SPOKE TO:

Mr. Charlie Janson OF Machias Water District

(716) 353-8283

CONCERNING: groundwater

AND DECIDED: groundwater is the only source of potable water within 3 miles of the site. Several homes have their own wells dug. The water district serves between 180-200 homes (~ 684-760 people). Land is not irrigated.

CC:

CC:

SIGNED: Troy Goodman

SIGNED:

REFERENCE 9

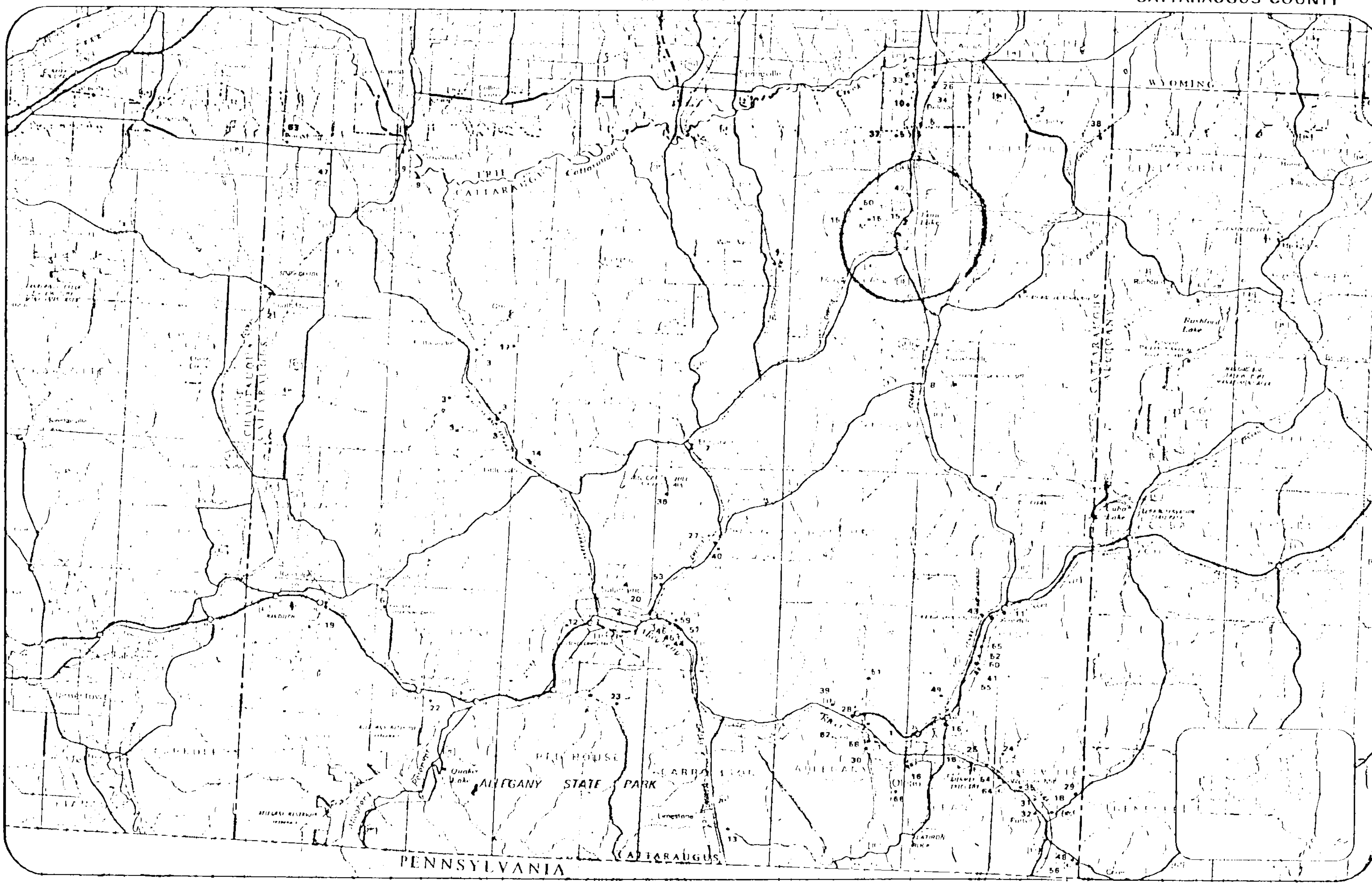
New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

CATTARAUGUS COUNTY



SCALE 1:250,000

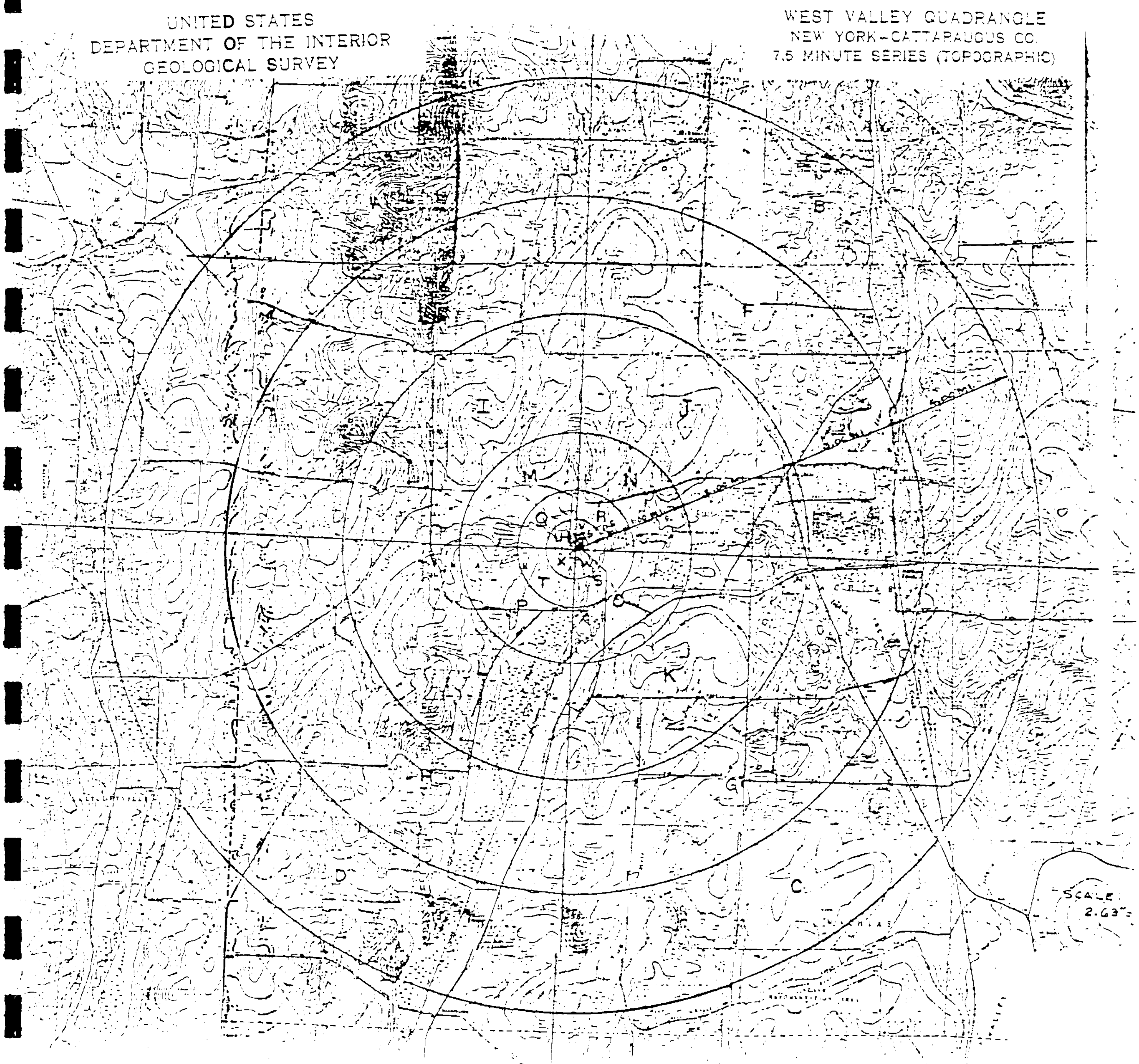
5 0 5 MILES

NORTH

CATTARAUGUS COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
1	Allegany Village	2200	Wells
2	Arcade Village (Wyoming Co, Page 10)		Wells
3	**Catteraugus Village**	**1200**	**Wells (Springs)**
4	Crystal Water Company (West Valley)	600	Wells
5	Delevan Village	1050	Wells (Springs)
6	East **Randolph Village**	1200	Wells
7	Elli**cottville Village**	1100	Wells
8	Franklinville Village	1900	Wells
9	Gowanda Village	3500	Point Peter Brook Reservoir, Wells
10	Grove Street Water Supply	70	Wells
11	Hinsdale Water District	350	Wells
12	Jimersontown Resettlement	250	Wells
13	Limestone Village	550	Wells
14	Little Valley Village	1700	Wells
15	Machias Water District	1000	Wells (Springs)
16	Olean City	18207	Olean Creek, Wells
17	Otto Water District	100	Wells
18	Portville Village	1300	Wells
19	**Randolph Village**	1500	Wells
20	Salamanca City	6890	Newton Run Reservoir, Wells
21	South Dayton Village	700	Wells
22	Steamburg Resettlement Area	200	Wells
	Non Municipal Community		
23	Allegany State Park	45	Wells
24	Barbers Trailer Ranch	50	Wells
25	Burton's Trailer Court	12	Wells
26	Charlie Browns Trailer Court	NA	Wells
27	Chase's Trailer Park	27	Wells
28	Colonial Village	NA	Wells
29	Country Corners Trailer Park	80	Wells
30	Country Squire Mobile Court	78	Wells
31	Deans Trailer Court	45	Wells
32	Deer Pen Mobile Home Park	24	Wells
33	Dumar Trailer Court	NA	Wells
34	Elliott's Apartments	NA	Wells
35	Five Acres Trailer Park	23	Wells
36	Forestry Camp 2	60	Wells
37	Foxfire Haven	35	Wells
38	Freedom Park	14	Wells
39	Giardini Mobile Court	NA	Wells
40	Green Valley Estates	NA	Wells
41	Happy Days Mobile Court	33	Wells
42	Highland Park Village	15	Wells
43	Hillview Village	150	Wells
44	Hoag's Mobile Manor Sec # 1	24	Wells
45	Hoag's Mobile Manor Sec # 2	30	Wells
46	Hoag's Mobile Manor Sec # 3	130	Wells
47	J.N. Adam Developmental Center	550	Wells
48	Jolee Mobile Home Court	40	Wells
49	Kent's Trailer Park	20	Wells
50	Lazy B Ranch	45	Wells
51	Longacres Mobile Court	36	Wells
52	Mac Haven Mobile Park	15	Wells
53	Muzi's Trailer Park	37	Wells
54	Pines Trailer Park	63	Wells
55	Pleasant Valley Mobile Court	36	Wells
56	Prosser Homes	36	Wells
57	Seneca Trailer Park	45	Wells
58	Sherwood Mobile Home Court	54	Wells
59	Stalakas Trailer Park	42	Wells
60	Sweet Mountain Trailer Park	39	Wells
61	Twin Lakes Mobile Homes	330	Wells
62	Valley View Estates	90	Wells
63	Weber's Mobile Home Court	45	Wells
64	White Birch Trailer Court	63	Wells
65	White Lantern Mobile Court	63	Wells
66	Woodlawn Mobile Home Court	25	Wells

REFERENCE 10

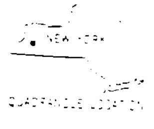


ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———

Medium-duty ——— Unimproved dirt ....

State Route



WEST VALLEY, N. Y.

N4222.5—W7830/7.5

1964

AMS 5268 I NE—SERIES V821

HRS REFERENCE [10]

NUMBER OF HOUSES PER RADIUS

RADIUS (MILES)	QUADRANT NE	SE	SW	NW	TOTAL	POPULATION TOTALS (x3.8)
0-0.25	1	0	0	0	1	3.8
0.25-0.5	1	1	0	0	2	7.6
0.5-1	2	8	3	3	16	60.8
1-2	161	14	6	18	199	756.2
2-3	361	82	20	18	481	1827.8
3-4	185	39	29	34	287	1090.6

NUMBER OF HOUSES PER AREA

TOTAL RADIUS (MILES)	QUADRANT NE	SE	SW	NW	TOTAL	POPULATION TOTALS (x3.8)
0-0.25	1	0	0	0	1	3.8
0-0.5	2	1	0	0	3	11.4
0-1	4	9	3	3	19	72.2
0-2	165	23	9	21	218	828.4
0-3	526	105	29	39	699	2656.2
0-4	711	144	58	73	986	3746.8

REFERENCE 13

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, Secretary

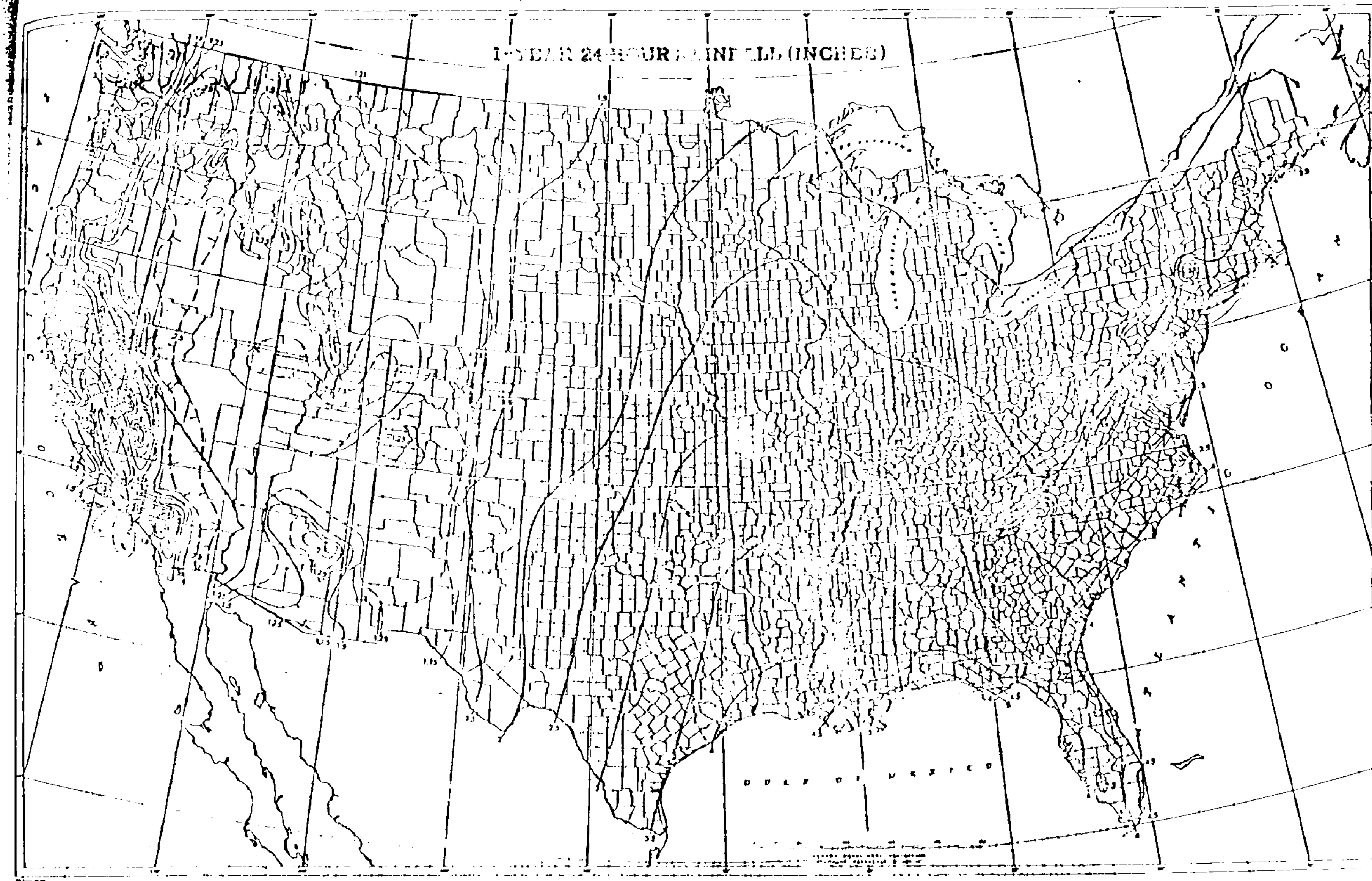
WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture


1-YEAR 24-HOUR RAINFALL (INCHES)

REFERENCE 14

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2a REGION: 9 SITE CODE: 905013
EPA ID: NYD980780803

NAME OF SITE: Machias Gravel Pit
STREET ADDRESS: Very Road
TOWN/CITY: Machias COUNTY: Cattaraugus ZIP: 14101

SITE TYPE: Open Dump- X Structure- Lagoon- Landfill- Treatment Pond-
ESTIMATED SIZE: 3.5 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME.............: Town of Machias
CURRENT OWNER ADDRESS..........: Town Hall, Machias, NY
OWNER(S) DURING USE............: Town of Machias
OPERATOR DURING USE............: Town of Machias
OPERATOR ADDRESS...............: Town Hall, Machias, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From Mar 1978 To Sep 1978

SITE DESCRIPTION:

This site was reported to have received 600 drums of waste material during 1978. The drums were suspected of containing wastes from Motorola Corporation in Arcade, NY. Approximately one-half of the remainig material was surface piled and some was used by the Town to control dust on local roads. The surrounding area is rural with residences concentrated two miles east of the site. A State Superfund Phase I investigation has been completed. The on-site drums were sampled in 1985, and 160 drums were removed in 1986. The remainder of the drums were removed as of June, 1988. A Phase II investigation of this site began in October, 1988, and was completed in 1989.

HAZARDOUS WASTE DISPOSED: Confirmed- X Suspected- X

TYPE		QUANTITY (units)
1,1,1-trichloroethane	beta endosulfan	Quantity of individual contaminants is unknown; a total of approximately 300 55-gallon drums were emptied or have leaked onto the ground surface.
trichloroethene	heptachlor epoxide	
1,1-dichloroethene	gamma BHC	
phenanthrene	4,4'-DDD	
di-n-butylphthalate	4,4'-DDE	
aluminum	4,4'-DDT	
chromium	endrin	

SITE CODE: 905013

ANALYTICAL DATA AVAILABLE:
Air- Surface Water- Groundwater- X Soil- X Sediment- None-

CONTRAVENTION OF STANDARDS:
Groundwater- X Drinking Water- X Surface Water- Air-

LEGAL ACTION:

TYPE..: None State- Federal-
STATUS: Negotiation in Progress- Order Signed-

REMEDIAL ACTION:

Proposed- Under Design- In Progress- Completed-

NATURE OF ACTION: None

GEOTECHNICAL INFORMATION:
SOIL TYPE: Gravelly Sandy Loam
GROUNDWATER DEPTH: 40 ft

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

More investigation is needed to determine the extent and magnitude of contamination at this site. Local residents use groundwater for drinking.

ASSESSMENT OF HEALTH PROBLEMS:

REFERENCE 17

01/26/90

NATURAL HERITAGE PROGRAM DATABASE REPORT (IR2.frm)
RARE PLANTS, ANIMALS, AND NATURAL COMMUNITIES

CO.	TOWN NAME	USGS 7 1/2' TOPOGRAPHIC MAP	LAT.	LONG.	SIZE IN ACRES (IF KNOWN)	SCIENTIFIC NAME	COMMON NAME	A/I=anim C=commun P=plant O=other	PRECISION S=second M=minute	YEAR LAST OBS.	EO RANK	NYS LEGAL STATUS	HERITAGE GLOBAL/STATE RANK		HERITAGE OFFICE USE
CATT	MACHIAS	DELEVAN				CAREX CHORDORRHIZA	CREEPING SEDGE	P	S	1986	CD	R	G5	S2	
CATT	MACHIAS	DELEVAN				INLAND POOR FEN		C	S	1986	A	U	G4	S3	
CATT	MACHIAS	DELEVAN				ARMORACIA AQUATICA	LAKE-CRESS	P	M	1922	H	R	G4?	S1S3	
CATT	MACHIAS	WEST VALLEY				CAREX SCHWEINITZII	SCHWEINITZ SEDGE	P	S	1986	AB	R	G3	S2	
CATT	MACHIAS	WEST VALLEY				INLAND POOR FEN		C	S	1986	B	U	G4	S3	

ALL SPECIES LISTED ARE REPORTED WITHIN 3 MILES OF THE SITE

KEY

EO (Element Occurrence)	NYS LEGAL STATUS	HERITAGE RANK	
Relative quality of occurrences		GLOBAL	STATE
A - Excellent B - Good C - Marginal D - Poor H - Historical (no recent information)	R - Reported only. No verified specimens. U - Unknown.	G3 - Rare or local throughout range, or restricted range. 21-100 occurrences. Very vulnerable. G4 - Apparently secure locally. G5 - Demonstrably secure globally; rare at edges of range.	S1 - 5 or fewer occurrences. Very vulnerable. S2 - 6-20 occurrences; few remaining acres, restricted/threatened habitat. Very vulnerable. S3 - Typically 21-100 occurrences. Vulnerable.

EPA 2070-13

5.6 EPA POTENTIAL HAZARDOUS WASTE SITE, SITE INSPECTION REPORT (FORM 2070-13)

Site Inspection Report

EPA Form 2070-13

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	Town of Machias Gravel Pit
02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER	Very Road
03 CITY	Town of Machias
04 STATE	NY
05 ZIP CODE	14101
06 COUNTY	Cattaraugus
07 COUNTY CODE	
08 CONG. DIST.	
09 COORDINATES LATITUDE	42 24 31 . 7N
LONGITUDE	0783200 . 0N

10 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	8 / 11 / 88
02 SITE STATUS	☒ ACTIVE ☐ INACTIVE
03 YEARS OF OPERATION	1978 (BEGINNING YEAR) / 1978 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ____ (Name of firm)
☐ E. STATE ☒ F. STATE CONTRACTOR LMS Engineers (Name of firm) ☐ G. OTHER ____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Robert Costa	Project Geologist	LMS	(914) 735-8300

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Edward Hastings	Hazwaste/Groundwater Field Coordinator	LMS	(914) 735-8300
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1130	Sunny; 90°F; 70% Relative Humidity

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Michael Komoroske	NYSDEC/DHWR/BHSC	(518) 457-0639

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Edward A. Maikish		LMS Engineers	914-735-8300	7 / 3 / 89

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A SOLID
- ☐ B POWDER, FINES
- ☐ C SLUDGE
- ☐ D OTHER ______ (Specify)
- ☐ E SLURRY
- ☒ F LIQUID
- ☐ G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS ______
- CUBIC YARDS ______
- NO. OF DRUMS 600

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A TOXIC
- ☒ B CORROSIVE
- ☐ C RADIOACTIVE
- ☒ D PERSISTENT
- ☒ E SOLUBLE
- ☐ F INFECTIOUS
- ☒ G FLAMMABLE
- ☒ H IGNITABLE
- ☐ I HIGHLY VOLATILE
- ☐ J EXPLOSIVE
- ☐ K REACTIVE
- ☐ L INCOMPATIBLE
- ☐ M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	Unknown		The contents of approximately
SOL	SOLVENTS	Unknown		300 drums were emptied or
PSD	PESTICIDES	Unknown		spilled on the ground surface
OCC	OTHER ORGANIC CHEMICALS	Unknown		
IOC	INORGANIC CHEMICALS			
ACD	ACIDS	Unknown		
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SOL	1,1,1-Trichloroethane	71-55-6		up to 880	ppm
SOL	Carbon-Tetrachloride	56-23-5		up to 3700	ppb
SOL	Trichloroethene	79-01-6		up to 160	ppm
SOL	1,1-dichloroethene	75-35-4		up to 5.6	ppm
OCC	Phenanthrene	85-01-8		up to 11,000	ppb
OCC	di-n-butylphthalate	84-74-2		up to 98,000	ppb
PSD	beta endosulfan	115-29-7		up to 2	ppm
PSD	Heptachlor epoxide	76-44-8		up to 870	ppb
PSD	Gamma BHC	58-89-9		up to 860	ppb
PSD	4,4'-DDD	72-54-8		up to 2	ppm
PSD	4,4'-DDE	72-55-9		up to 6.1	ppm
PSD	4,4-DDT	50-29-3		up to 2.6	ppm
PSD	Endrin	72-20-8		up to 2.4	ppm

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	N/A		FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

RECRA Environmental Laboratories. 23 October 1983 Drum Sampling Analyses Report, and 29 March 1989 Groundwater Sampling Analyses Report.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D980780803

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION | 02 [X] OBSERVED (DATE 29 Mar 1989) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED 2656 | 04 NARRATIVE DESCRIPTION

Analytical data reported to LMS Engineers by Recra Environmental Laboratory showed groundwater contaminated with 1,1,1-trichloroethane; carbon tetrachloride; and trichloroethene.

01 [ ] B. SURFACE WATER CONTAMINATION | 02 [ ] OBSERVED (DATE ______) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ | 04 NARRATIVE DESCRIPTION

No Analytical Data Available

01 [ ] C. CONTAMINATION OF AIR | 02 [ ] OBSERVED (DATE ______) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ | 04 NARRATIVE DESCRIPTION

No Analytical Data Available

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS | 02 [ ] OBSERVED (DATE ______) | [ ] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ | 04 NARRATIVE DESCRIPTION

No Analytical Data Available

01 [XX] E. DIRECT CONTACT | 02 [X] OBSERVED (DATE ______) | [X] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED 72 | 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL | 02 [X] OBSERVED (DATE 9/4/85) | [X] POTENTIAL | [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED Unknown (Acres) | 04 NARRATIVE DESCRIPTION

Soil samples collected near drums contained phenanthrene; di-n-butylphthalate; 1,1,1-trichloroethane; trichloroethene; methylene chloride; heptachlor epoxide; and gamma-BHC.

01 [XX] G. DRINKING WATER CONTAMINATION | 02 [ ] OBSERVED (DATE ______) | [XX] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED 2656 | 04 NARRATIVE DESCRIPTION

Groundwater is currently the only source of potable water within 3 miles of the site.

01 [X] H. WORKER EXPOSURE/INJURY | 02 [ ] OBSERVED (DATE ______) | [X] POTENTIAL | [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED Unknown | 04 NARRATIVE DESCRIPTION

01 [XX] I. POPULATION EXPOSURE/INJURY | 02 [ ] OBSERVED (DATE ______) | [XX] POTENTIAL | [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED 2656 | 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No documented history identified

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

No documented history identified

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No documented history identified

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED ______ 04 NARRATIVE DESCRIPTION

No documented history identified

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No documented history identified

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE ______) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No documented history identified

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☒ OBSERVED (DATE 1978) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Up to 600 drums of liquid wastes, many of which contained hazardous materials, were stored on site; approximately 300 drums were poured/leaked onto the ground surface.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Some of the waste oils received at the site were spread on town roads for dust control.

III. TOTAL POPULATION POTENTIALLY AFFECTED: Unknown

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files
LMS Phase II investigation

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980780803

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES	None Identified			
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☒ C. DRUMS, ABOVE GROUND	300	55-gal drums
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND	were emptied/spilled on the ground	
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

☐ A. INCENERATION
☐ B. UNDERGROUND INJECTION
☐ C. CHEMICAL/PHYSICAL
☐ D. BIOLOGICAL
☐ E. WASTE OIL PROCESSING
☐ F. SOLVENT RECOVERY
☐ G. OTHER RECYCLING/RECOVERY
☐ H. OTHER (Specify)

05 OTHER

☐ A. BUILDINGS ON SITE

None

06 AREA OF SITE

3.5 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☒ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC

The site is an active gravel pit operated by the Town of Machias. Approximately 300 of the 600 55-gallon drums of waste material generated by Motorola of Arcade, N.Y. were dumped/spilled onto the ground surface.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☒ YES ☐ NO

02 COMMENTS

No barriers to the site exist. The level/amount of surface contamination is unknown

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports.)

NYSDEC Region 9 Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D980780803

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A ☐	B ☒
NON-COMMUNITY	C ☐	D ☒

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A ☒	B ☐	C ☐
D ☒	E ☐	F ☐

03 DISTANCE TO SITE
A 2.0 (mi)
B 0.1 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING
☒ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 2656

03 DISTANCE TO NEAREST DRINKING WATER WELL 0.1 (mi)

04 DEPTH TO GROUNDWATER 41 (ft)

05 DIRECTION OF GROUNDWATER FLOW east-southeast

06 DEPTH TO AQUIFER OF CONCERN 41 (ft)

07 POTENTIAL YIELD OF AQUIFER 8,640 (gpd)

08 SOLE SOURCE AQUIFER ☒ YES ☐ NO

09 DESCRIPTION OF WELLS (including usage, depth, and location relative to population and buildings)

Private wells in the area are screened in the glacial till/outwash aquifer at 30-40 feet below the ground surface.

10 RECHARGE AREA
☒ YES ☐ NO
COMMENTS Gravel pit is located near the apex of a local topographic high.

11 DISCHARGE AREA
☐ YES ☐ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE
☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
☐ C. COMMERCIAL, INDUSTRIAL
☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
Ischua Creek Tributary	☐	0.18 (mi)
Ischua Creek	☐	0.38 (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 72 (NO. OF PERSONS)	B. 828 (NO. OF PERSONS)	C. 2656 (NO. OF PERSONS)

02 DISTANCE TO NEAREST POPULATION 0.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 76

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The area near the site is sparsely populated; however, the nearest home is 500 ft southeast of the site. The Town of Machias is located approximately 2 miles northeast of the site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D980780803

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A $10^{-6} - 10^{-8}$ cm/sec ☐ B $10^{-4} - 10^{-6}$ cm/sec ☒ C $10^{-4} - 10^{-3}$ cm/sec ☐ D GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
Unknown (ft)	Unknown (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
11 (in)	2.25 (in)	3-5 %	east-southeast	5-8 %

09 FLOOD POTENTIAL: SITE IS IN ______ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A >3 (mi) OTHER: B 0.57 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species): >3 (mi)

ENDANGERED SPECIES: None identified

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS, NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A 2 (mi)	B >3 (mi)	C ______ (mi)	D 0.1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is located on a local topographic high. Farmland surrounds the site. Bird swamp, a NYSDEC-regulated fresh-water wetland, is located 0.2 miles south of the site. Ischua Creek, a class C waterbody, is located 0.4 miles east of the site.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

U.S. Department of Commerce. 1979. Rainfall Frequency Atlas of the U.S.

U.S.G.S. West Valley, New York topographic map.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	4	RECRA Environmental Laboratory	available
SURFACE WATER			
WASTE	4	RECRA Environmental Laboratory	available
AIR			
RUNOFF			
SPILL			
SOIL	2	RECRA Environmental Laboratory	available
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Air Monitoring	No contaminants were detected in the air with a HNU PID.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☒ AERIAL

02 IN CUSTODY OF Town of Machias
(Name of organization or individual)

03 MAPS ☐ YES ☐ NO

04 LOCATION OF MAPS

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. CURRENT OWNER(S) / **PARENT COMPANY** (if applicable)

	Current Owner		Parent Company
01 NAME	Town of Machias	08 NAME	
02 D+B NUMBER		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	Town Hall	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		11 SIC CODE	
05 CITY	Town of Machias	12 CITY	
06 STATE	NY	13 STATE	
07 ZIP CODE	14101	14 ZIP CODE	
01 NAME		08 NAME	
02 D+B NUMBER		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		11 SIC CODE	
05 CITY		12 CITY	
06 STATE		13 STATE	
07 ZIP CODE		14 ZIP CODE	
01 NAME		08 NAME	
02 D+B NUMBER		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		11 SIC CODE	
05 CITY		12 CITY	
06 STATE		13 STATE	
07 ZIP CODE		14 ZIP CODE	
01 NAME		08 NAME	
02 D+B NUMBER		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		11 SIC CODE	
05 CITY		12 CITY	
06 STATE		13 STATE	
07 ZIP CODE		14 ZIP CODE	

III. PREVIOUS OWNER(S) (List most recent first) / **IV. REALTY OWNER(S)** (If applicable; list most recent first)

	Previous Owner		Realty Owner
01 NAME	N/A	01 NAME	
02 D+B NUMBER		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		04 SIC CODE	
05 CITY		05 CITY	
06 STATE		06 STATE	
07 ZIP CODE		07 ZIP CODE	
01 NAME		01 NAME	
02 D+B NUMBER		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		04 SIC CODE	
05 CITY		05 CITY	
06 STATE		06 STATE	
07 ZIP CODE		07 ZIP CODE	
01 NAME		01 NAME	
02 D+B NUMBER		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE		04 SIC CODE	
05 CITY		05 CITY	
06 STATE		06 STATE	
07 ZIP CODE		07 ZIP CODE	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980780803

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Town of Machias	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**
Town Hall	

05 CITY	06 STATE	07 ZIP CODE
Town of Machias	NY	14101

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
12 STREET ADDRESS (P.O. Box, RFD #, etc.)	**13 SIC CODE**

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER
N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER
12 STREET ADDRESS (P.O. Box, RFD #, etc.)	**13 SIC CODE**

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER
12 STREET ADDRESS (P.O. Box, RFD #, etc.)	**13 SIC CODE**

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER
12 STREET ADDRESS (P.O. Box, RFD #, etc.)	**13 SIC CODE**

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980780803

II. ON-SITE GENERATOR

01 NAME: N/A			02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:	

III. OFF-SITE GENERATOR(S)

01 NAME: Motorola			02 D+B NUMBER:	01 NAME:			02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:
05 CITY: Arcade	06 STATE: NY	07 ZIP CODE:		05 CITY:	06 STATE:	07 ZIP CODE:	
01 NAME:			02 D+B NUMBER:	01 NAME:			02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:		05 CITY:	06 STATE:	07 ZIP CODE:	

IV. TRANSPORTER(S)

01 NAME: Daniel Griswald			02 D+B NUMBER:	01 NAME:			02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): Unknown			04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:		05 CITY:	06 STATE:	07 ZIP CODE:	
01 NAME:			02 D+B NUMBER:	01 NAME:			02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:	03 STREET ADDRESS (P.O. Box, RFD #, etc.):			04 SIC CODE:
05 CITY:	06 STATE:	07 ZIP CODE:		05 CITY:	06 STATE:	07 ZIP CODE:	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ D. SPILLED MATERIAL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ E. CONTAMINATED SOIL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ F. WASTE REPACKAGED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☒ G. WASTE DISPOSED ELSEWHERE 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
Drums were transported from site; destination is not known.

01 ☐ H. ON SITE BURIAL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ I. IN SITU CHEMICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ J. IN SITU BIOLOGICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ K. IN SITU PHYSICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ L. ENCAPSULATION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ M. EMERGENCY WASTE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ N. CUTOFF WALLS 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ P. CUTOFF TRENCHES/SUMP 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ Q. SUBSURFACE CUTOFF WALL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D980780803

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ S. CAPPING/COVERING — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ V. BOTTOM SEALED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ W. GAS CONTROL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ X. FIRE CONTROL — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ Y. LEACHATE TREATMENT — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ Z. AREA EVACUATED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ 2. POPULATION RELOCATED — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
No documented history

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D980780803

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☒ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

Site was placed on the NYS list of inactive hazardous waste sites. NYS authorized a state-sponsored Phase II investigation due to insufficient investigatory/remediation action by the Town of Machias.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYSDEC Region 9 Files.