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USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

UPDATE OF THE INITIAL INSTALLATION ASSESSMENT OF SENECA ARMY DEPOT, NY

J. D. Bonds, G.T. Kaminski, J.K. Sherwood, and K.A. Becker

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
P.O. Box ESE
Gainesville, FL 32602

AUGUST 1988

FINAL REPORT

Prepared for:

COMMANDER
Seneca Army Depot
Romulus, NY 14541
and
U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground, MD 21010-5401

US ARMY
MATERIEL
COMMAND

DEPARTMENT OF THE ARMY
US ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5401

REPLY TO
ATTENTION OF

Randy
Tom

CETHA-IR-A (50)

7 OCT 1988

MEMORANDUM FOR: Commander, Seneca Army Depot, ATTN: SDSSE-AD, Romulus, NY 14541

SUBJECT: Update of the Initial Installation Assessment of Seneca Army Depot

1. The final draft of the subject report was sent to you in Jul 88 to be forwarded to the State and U.S. Environmental Protection Agency for review. No comments were received from these agencies, and the report has now been finalized. Eight copies of the report are forwarded (enclosure) for your information and to honor outside agency requests.

2. Point of contact for this action is Ms. Lisa Botluk, AUTOVON 584-3182.

FOR THE COMMANDER:

ANDREW W. ANDERSON
Chief
Installation Restoration Division

Encl

CF (w/encl, 1 copy only):
Cdr, AMC, ATTN: AMCEN-A (Ms. Lydia Sanchez), 5001 Eisenhower Avenue, Alexandria, VA 22333-0001
Cdr, DESCOM, ATTN: AMSDS-RM-EFD (Mr. Toplisek), Chambersburg, PA 17201-4170

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An onsite installation assessment was performed at Seneca Army Depot (SEAD), Romulus, NY, on 17 and 18 February 1987 to determine if any environmental/hazardous waste disposal conditions had changed since the Initial Installation Assessment (IIA) was conducted in 1980 and if such changes, coupled with interim changes in environmental regulations or mission, had altered the contaminant migration situation and would change the previous recommendation to not conduct a site investigation (SI). Information obtained during onsite visit was used to update the IIA report. It was concluded that potential ground water contamination may exist at SEAD. It was recommended that USATHAMA conduct an SI. Since the onsite visit, the Army has adopted a new policy which mandates that all Army properties will undergo a site characterization using a modified U.S. Environmental Protection Agency Hazard Ranking System. Sites identified at SEAD under the IIA and in this report will be evaluated and ranked during the site characterization study.

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SUMMARY

An onsite installation assessment was performed at Seneca Army Depot (SEAD), Romulus, NY, on 17 and 18 February 1987 to determine if any environmental/hazardous waste disposal conditions had changed since the Initial Installation Assessment (IIA) was conducted in 1980 and if such changes, coupled with interim changes in environmental regulations or mission, had altered the contaminant migration situation and would change the previous recommendation to not conduct a site investigation (SI). Information obtained during the onsite visit was used to update the IIA report.

It was concluded that ground water contamination exists in the vicinity of the former incinerator at Bldg. 2207 and the adjacent landfill, and the potential for ground water contamination in the area of the former Munitions Washout Facility leach field.

Based on the above conclusions and the existence of an ongoing monitoring program, it is recommended that U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) conduct an SI.

Since the onsite visit, the Army has adopted a policy which mandates that all properties will undergo a site characterization study using a modified U.S. Environmental Protection Agency Hazard Ranking System. Sites identified at SEAD under the IIA and in this report will be evaluated and ranked during the site characterization study.

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LIST OF ACRONYMS AND ABBREVIATIONS

AMC	U.S. Army Materiel Command
Ba	barium
BOD_5	5-day biochemical oxygen demand
Cd	cadmium
CE	U.S. Army Corps of Engineers
cm	centimeter
CSL	Chemical Systems Laboratory
DARCOM	U.S. Army Materiel Development and Readiness Command [now U.S. Army Materiel Command (AMC)]
DOE	U.S. Department of Energy
EP	extraction procedure
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
ESE	Environmental Science and Engineering, Inc.
GSA	General Services Administration
ha	hectare
IIA	Initial Installation Assessment
km	kilometer
m	meter
MCL	maximum contaminant level
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NYSDEC	New York State Department of Environmental Control
NYSHD	New York State Health Department
OB/OD	open burning/open detonation
Pb	lead
PCB	Polychlorinated biphenyl
PEP	propellant, explosive, and pyrotechnic
PFR	Plan for Reclamation
RCRA	Resource Conservation and Recovery Act

LIST OF ACRONYMS AND ABBREVIATIONS

(Continued, Page 2 of 2)

SI	site investigation
SEAD	Seneca Army Depot
STP	sewage treatment plant
SWMU	Solid Waste Management Units
TDA	Temporary Duty Assignment
TNT	trinitrotoluene
TOE	Term of Enlistment
TOX	total organic halogens
TSS	total suspended solids
µg/g	micrograms per gram
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency

1.0 GENERAL

1.1 PURPOSE OF THE EVALUATION

An onsite records search [Initial Installation Assessment (IIA)] was conducted at Seneca Army Depot (SEAD), Romulus, NY, in 1980 to assess past and current use of toxic and hazardous materials, as well as the potential for these substances to migrate off the installation.

The original recommendation from the 1980 IIA was for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) to conduct a survey [site investigation (SI)] at SEAD. The installation had several studies in progress during 1980, and, upon submission of the preliminary results, the USATHAMA recommendation was changed to not conduct an SI study. Many of the studies performed at SEAD required long-term monitoring, and the decision by USATHAMA was made based on limited information.

An evaluation of the IIA for SEAD was conducted in February 1987 to determine if previous non-SI conditions had changed and if such changes, coupled with interim changes in environmental regulations or mission, had altered the contaminant migration/hazard situation.

All information concerning operations existing at the time of the original assessment was reviewed and incorporated into this report, along with new information made available to the team upon assignment of the update and by the installation at the time of the revisit.

1.2 AUTHORITY

U.S. Army Materiel Development and Readiness Command (DARCOM) Regulation 10-30, Mission and Major Functions of USATHAMA, 13 July 1984.

1.3 INTRODUCTION

1. In reviewing earlier published IIA reports (1976 to 1981), the USATHAMA Installation Restoration Division determined some installations would require additional evaluations due to changes in environmental laws, changes in mission, and environmental problems discovered after the onsite visit.
2. Subsequent to the IIA conducted in June 1979 and published in January 1980, USATHAMA has determined a report update would be required for SEAD.
3. Seneca Army Depot personnel were contacted to outline the scope of the evaluation, provide guidelines to SEAD personnel, and obtain advance information for review by the evaluation team.
4. Seneca Army Depot personnel were briefed on the evaluation program on 17 February 1987 by Dr. John D. Bonds from Environmental Science and Engineering, Inc. (ESE), a USATHAMA contractor.
5. Various Government agencies were contacted for documents pertinent to the evaluation effort. Agencies contacted include:
   a. U.S. Army Environmental Hygiene Agency (USAEHA) (Aberdeen Proving Ground, MD); and
   b. U.S. Environmental Protection Agency (EPA), Environmental Photographic Interpretation Center (EPIC) (Vint Hill Farms Station, Warrenton, VA).
6. The onsite phase of the evaluation was conducted on 17 February 1987. The information presented in this report is current, as of the date of the evaluation. The following personnel from ESE, under Contract No. DAAA15-85-D-0017, Delivery Order No. 007, were assigned to the evaluation team:
   - Dr. John D. Bonds, Team Leader;
   - Mr. Guy T. Kaminski, Team Engineer;
   - Ms. Janet K. Sherwood, Document Coordinator; and
   - Ms. Kathleen Becker, Librarian.

7. In addition to the records review, SEAD employees provided information on various sites (see App. A). A ground tour of SEAD was made and photographs were taken.
8. The installation update focused primarily on those areas identified as potential problems in the original assessment and environmental studies performed subsequent to the original site visit.

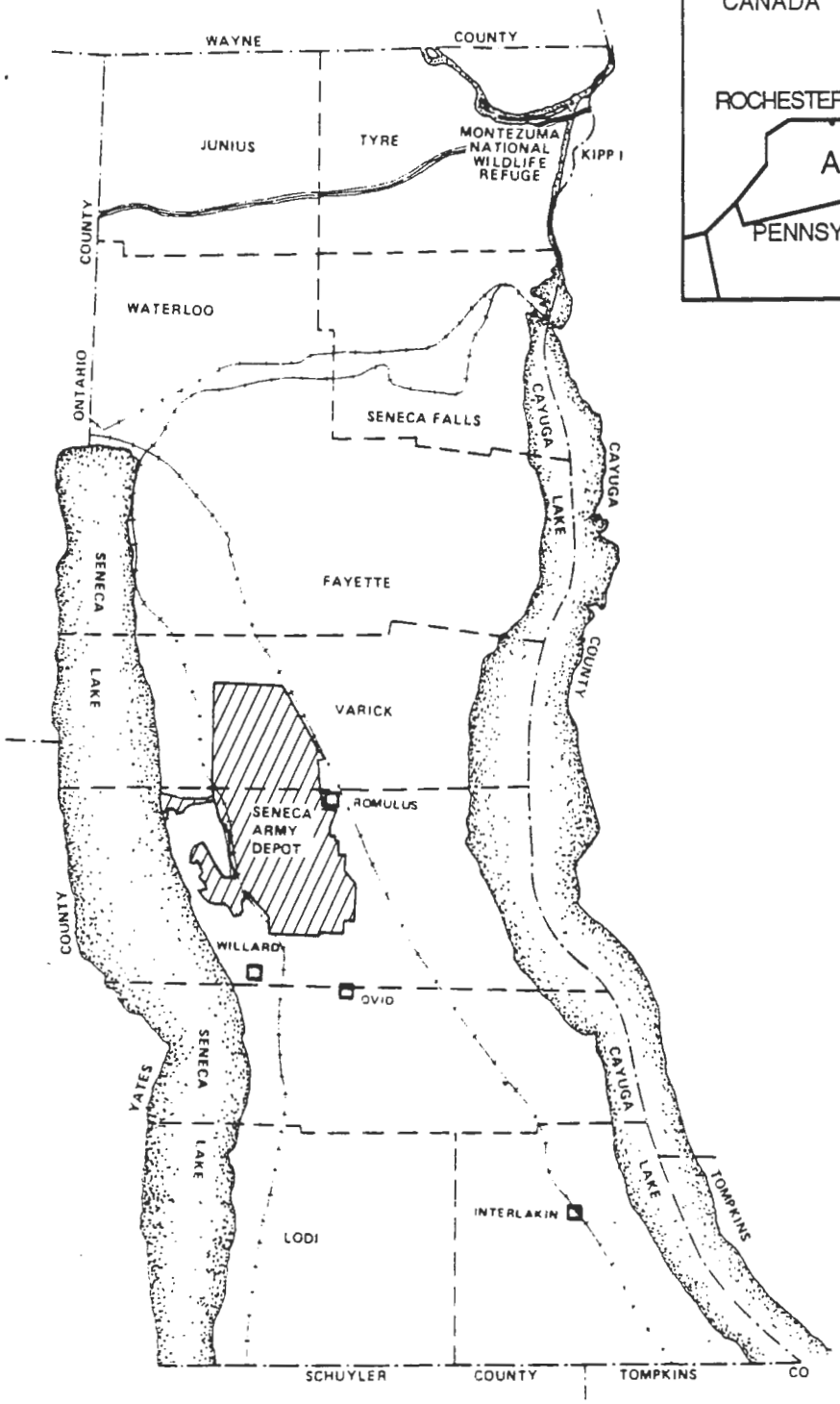
1.4 INSTALLATION HISTORY

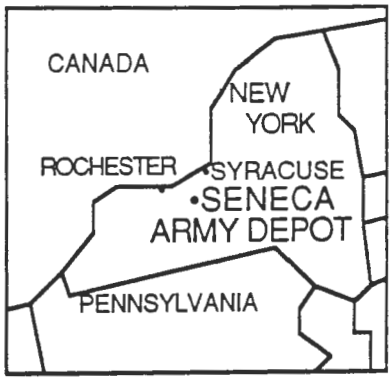
Seneca Army Depot is situated in the heart of the Finger Lakes Region of New York State (Fig. 1-1). Seneca Army Depot is approximately 80 kilometers (km) southeast of Rochester, 80 km southwest of Syracuse, and 50 km northwest of Ithaca. Sparsely populated farmland covers most of the surrounding area. New York State Highways 96 and 96A adjoin the depot lands on the east and west boundaries.

Construction of the Seneca Ordnance Depot was started in July 1941. The original installation encompassed 27,013 hectares (ha) of Seneca County farmland. Later expansion included a 1,524-meter (m) airstrip from the former Sampson Air Force Base.

Civilian employment peaked in July 1943 (2,511) and reached a low in November 1946 (595). Supplementing the 300 to 400 military personnel during the Korean Conflict, civilian employment fluctuated between 803 and 1,821. In recent years, civilian employment has averaged approximately 700.

In October 1961, the North Depot Activity was consolidated with Seneca Ordnance Depot. Overall command was assumed by the Commanding Officer, Seneca Ordnance Depot.





SOURCES: USATHAMA, 1980.
ESE, 1987.

Figure 1-1
LOCATION OF SENECA ARMY DEPOT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

In August 1963, Seneca Ordnance Depot was transferred from the Chief of Ordnance to the U.S. Army Supply and Maintenance Command and renamed Seneca Army Depot. On July 1, 1966, SEAD was reassigned to the U.S. Army Materiel Command (AMC), which subsequently became DARCOM. On September 1, 1976, DARCOM was activated with command and control over all DARCOM depots.

The current general mission of SEAD is as follows:

1. To provide for the receipt, storage, stock distribution, and care and preservation of conventional ammunition and explosives, General Services Administration (GSA) strategic and critical materials, and Office of Civil Defense engineer equipment.
2. To provide a special weapons activity to include the receipt, storage, and issue of primary and secondary items.
3. To perform depot-level maintenance, demilitarization, and surveillance on conventional ammunition and special weapons.
4. To receive, inspect, test, classify, rehabilitate as required, preserve, store, and issue industrial plant equipment.
5. To command assigned Term of Enlistment (TOE) and Temporary Duty Assignment (TDA) units as well as provide logistical support and training assistance to U.S. Army Reserve and National Guard units.
6. To process and provide for the movement of household goods, personal baggage, and passenger services for military and civilian personnel residing in 15 counties in central New York State.
7. To provide medical, dental, veterinary, commissary, post exchange, claims, and legal assistance services for authorized personnel.
8. To operate a military Class C airfield for logistics shipments, accommodating up to and including C-141 aircraft.
9. To provide logistical and administrative support for tenant units and other Government agencies.

Assigned, attached, and tenant organizations at SEAD are as follows:

1. Organizations assigned and attached:

   295th MP Company
   833D Ordnance Company
   HQ and HQ Company

2. Tenant activities include:

   USA Readiness Group--Seneca
   143D Ordnance Detachment (EOD)
   902D MI GP, Seneca Resident OFC
   Seneca BR OFC--1st Region--USA CIDC
   WNY Section, VET--MEDDAC
   USACC--Seneca
   US Army Health Clinic--MEDDAC
   US Army Dental Clinic--MEDDAC
   US Army Commissary
   USA Engineer District NY--Seneca Resident Office
   US Coast Guard Loran C Station--Seneca
   DRMO Romulus Office--Site Scrap Branch
   NE Flight Detachment--Seneca (AVN Sect.)
   GAFB Exchange--SEAD
   GSA--Office of Stockpile Management

In August 1984, DARCOM was redesignated AMC and retained the responsibility for the operation of SEAD.

2.0 CONCLUSIONS, RECOMMENDATIONS, AND CURRENT STATUS OF RECOMMENDATIONS RESULTING FROM THE 1980 INSTALLATION ASSESSMENT OF SENECA ARMY DEPOT

2.1 CONCLUSIONS (AS STATED IN THE IIA PUBLISHED BY USATHAMA IN 1980)

1. Geological conditions are such that contaminants, if present, can migrate in both surface and subsurface waters.
2. Areas of SEAD are potentially contaminated with herbicides, heavy metals, explosives (Demolition/Burning Ground Area), and radioactive residues (Igloo Areas).
3. Evidence was uncovered to indicate migration of sewage wastes via effluent into the surface water. Although other materials may also be migrating, no supporting analytical data are available.

2.2 RECOMMENDATION (AS STATED IN THE IIA PUBLISHED BY USATHAMA IN 1980)

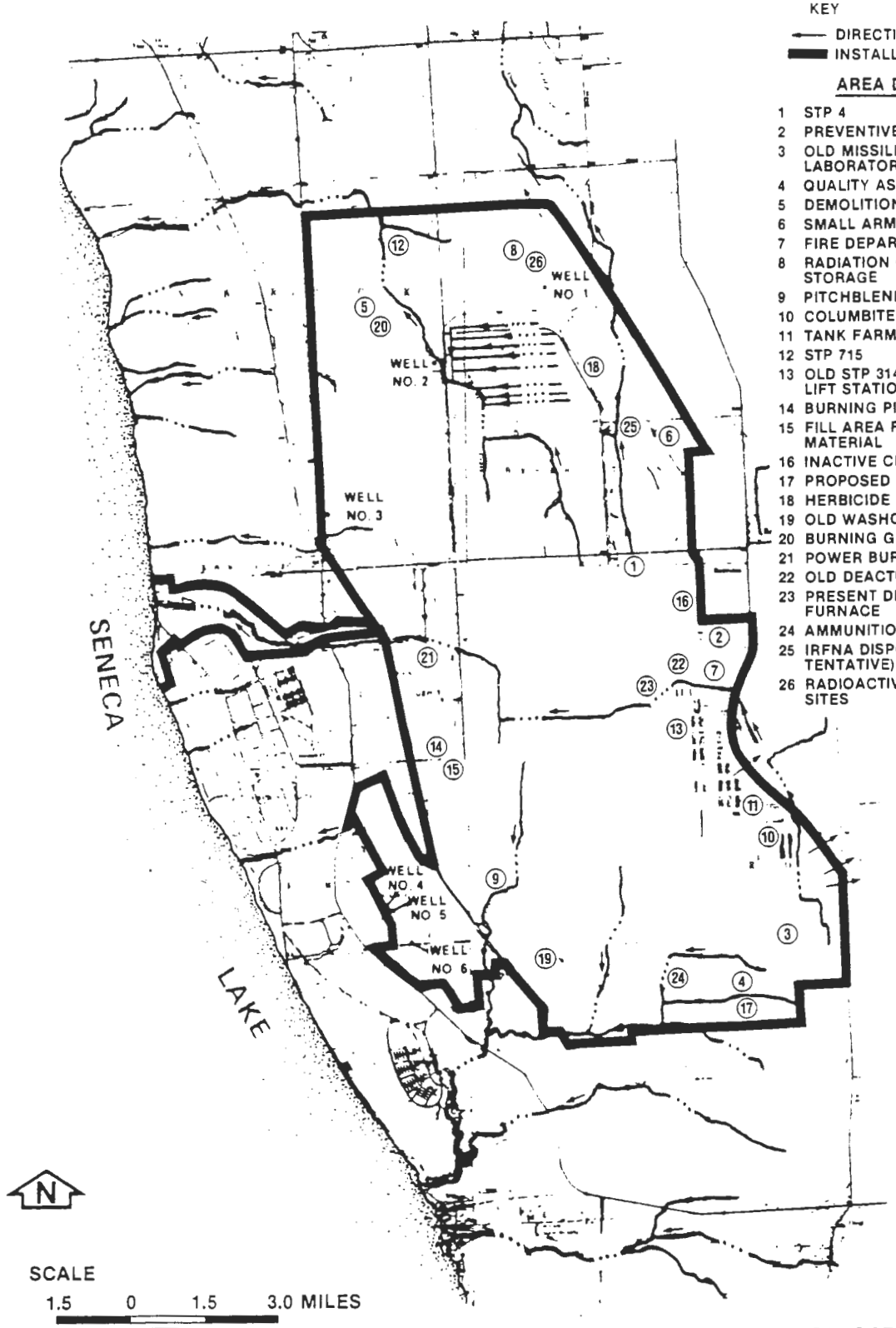
That USATHAMA conduct a survey (SI) of SEAD to determine if there is contaminant migration.

2.3 CURRENT STATUS OF RECOMMENDATIONS RESULTING FROM THE 1980 ASSESSMENT

2.3.1 SEWAGE TREATMENT

At the time of the IIA, National Pollutant Discharge Elimination System (NPDES) permit limitations were being exceeded by the effluents from the sewage treatment plants (STPs) on SEAD. One plant, located at Bldg. 715 (STP-715) (Area 1 on Fig. 2-1), discharges to Reeder Creek, and the other plant, located at Bldg. 4 (STP-4) (Area 6 on Fig. 2-1), discharges to a swampy area (Area 5 on Fig. 2-1). Because of the possibility for migration of contaminants into the surface waters, the IIA expressed concern about these STP discharges.

Subsequent to the IIA, a pollution abatement study was conducted by USAEHA (USAEHA, 1981a). This study indicated that the effluent from STP-4 had exceeded the secondary treatment limitations for 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS).



SOURCES: USATHAMA, 1980.
ESE, 1987.

Figure 2-1
POTENTIAL CONTAMINATION AREAS IDENTIFIED IN THE 1980 INSTALLATION ASSESSMENT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Based on the information obtained during the study, alterations were made at the STP-4. Changes at the STP included:

1. Synthetic medium replaced the rocks in the trickling filter,
2. A cover was installed, and
3. The recycle rate was increased.

In addition, the wetlands receiving the effluent from STP-4 were proposed as an alternative to a tertiary treatment upgrade. In 1982, USAEHA conducted an "Innovative Wetlands Wastewater Treatment Project" evaluation to assess the wetlands effectiveness at meeting NPDES requirements. The evaluation found that STP-4 was meeting secondary treatment requirements, and discharge from the wetlands was meeting NPDES tertiary treatment requirements with the exception of occasional excursions outside the required limitations by TSS and dissolved oxygen. Use of the swampy area as tertiary treatment has been approved and included in the permit requirement. Reportedly, STP-4 is currently operating within all permit requirements.

Since completion of the IIA, STP-715 also has been upgraded to tertiary treatment. Although the plant has been upgraded, effluent waters from an oil/water separator discharging to STP-715 have occasionally resulted in oil and grease concentrations above permit limitations. Seneca Army Depot has worked with the New York State Department of Environmental Control (NYSDEC) and has been able to increase the oil and grease concentrations allowed in the effluent under the NDPES permit. Sewage Treatment Plant 715 is currently operating in compliance of the new permit requirements for oil and grease and other parameters.

Sludge from both STP-4 and STP-715 was land applied as a soil conditioner prior to IIA. The sludge has since been analyzed by NYSDEC and determined to contain copper in excess of 1,000 micrograms per gram (µg/g). The State does not usually allow land application of sludges with copper concentration above 1,000 µg/g. Seneca Army Depot has been

stockpiling the sludge while applying for Part 360 of the land application permit, which will allow exceptions to the 1,000-µg/g limit. The application is currently under consideration by NYSDEC. The sludge pile [40-feet (ft) long, 20-ft wide, and 10-ft high] is covered by plastic sheeting to minimize leaching prior to final disposition of the permit application.

2.3.2 OPEN BURNING/OPEN DETONATION AREAS

The IIA indicated concern about potential contaminants at the open burning/open detonation (OB/OD) areas on SEAD and the possibility for contaminant migration. This concern and others resulted in the initial IIA recommendation to perform an RI/FS study at SEAD. The addendum to the IIA indicated that SEAD was included in a USAEHA program to determine the existence of ground water contamination at OB/OD areas used for propellant, explosive, and pyrotechnic (PEP) burning. The USAEHA program initially consisted of a 4-phase approach:

1. Screening installations for potential soil, surface water, and ground water contamination.
2. Field studies to sample surface soils at OB/OD grounds.
3. Summary of Phase 2 results into an overall evaluation of OB/OD grounds.
4. Resampling of OB/OD grounds determined to be contaminated to assess vertical and horizontal migration.

Seven monitor wells were installed at the OB/OD area and have been periodically monitored since USAEHA study was initiated (USAEHA, 1986). The ground water quality as determined by samples collected in September 1986 and March 1987 is presented in App. B. These data indicate the OB/OD area is not currently releasing contaminants to the ground water.

The Phase 2 study (USAEHA, 1983) identified soils at SEAD burning pads to be contaminated by metals in excess of the extraction procedure (EP) toxicity limits. Soils at Pads B and F were determined to be hazardous

due to elevated concentrations of barium (Ba) and lead (Pb), respectively. The majority of samples analyzed showed trace contamination by Pb, Ba, and cadmium (Cd) and some measurable quantities of explosives. In response to the Phase 2 study, SEAD had the Department of the Army Huntsville Division, Corps of Engineers (CE) develop a closure plan for OB Pads B and H. Seneca Army Depot sent the completed closure plan to USAEHA for review.

During the time CE had been developing the closure plan, USAEHA had completed the Phase 4 study (USAEHA, 1985). The Phase 4 study concluded that only Pad B was in excess of EP toxicity limits for Pb and Ba. The study also recommended closure of Pad B and that no action be taken regarding Pads F and H. Prior to SEAD submitting the closure plan for review, USAEHA also completed a Phase 5 study (USAEHA, 1986a) which offered recommendations for the proper operation of OB/OD facilities, including data to support development of a Resource Conservation and Recovery Act (RCRA) Part B Permit Writers Guidance Manual.

In 1986, after SEAD submitted the closure plan for review, USAEHA released a study (USAEHA, 1986b) with the purpose of providing technical guidance for closure of contaminated burning pads. The 1986 study recommended that SEAD close all pads which were used for PEP burning with either a natural clay or synthetic cap. Seneca Army Depot, following USAEHA recommendations, is currently in the process of preparing a revised closure plan.

2.3.3 INCINERATOR/LANDFILL AREA

Prior to 1977, materials intended for disposal were transported to an incinerator located in Bldg. 2207 (see Area 14 on Fig. 2-1). Ashes and other residues from the incinerator were temporarily stored in an earthen pit located on the northeast corner of the facility. When the pit was filled, the ashes and residues were removed, transported, and buried in the adjacent landfill. The incinerator in Bldg. 2207 at SEAD was

destroyed by fire in 1977. The former landfill area is located adjacent to Bldg. 2207 (see Fig. 2-2). The landfill has been closed and capped. Due to the possibility of leachate from the landfill entering the ground water, five monitoring wells were installed to assess ground water quality. Several indicator parameters (sulfate, chloride, and specific conductance) indicated the possibility of leachate from the landfill entering the ground water (USAEHA, 1981b).

In a recent study (USAEHA, 1986), four of the five monitoring wells were sampled and the ground water analyzed. Well PT-14 was not sampled because it had been broken off at ground level and was not accessible. The study determined that downgradient Well PT-12 exceeded State standards for chlorides and sulfates. Measurable concentrations of total organic halogens (TOX) were also found in Well PT-12, but concentrations did not exceed State or Federal standards. Since the onsite visit, SEAD has repaired Well PT-14 and all the wells have been sampled. The samples will be analyzed for volatile organics to determine if the ground water is contaminated by organic compounds. The results from the December 1986 and March 1987 analysis of the ground water are included as App. C. These results indicate the presence of trans-1, 2-dichloroethylene, trichloroethylene, and vinyl chloride in the ground water from monitor wells PT-12 and PT-14 at concentrations which exceed the proposed maximum contaminant levels (MCL) for all three compounds. Wells PT-12 and PT-14 are located downgradient from the former disposal areas. Because the concentrations in onpost wells exceeded the proposed MCL, the installation tested three offpost wells with a 0.3-mile radius downgradient of the incinerator/landfill disposal area. These tests were conducted by a SEAD contractor during the last week of August 1987. The results of the testing did not indicate contaminants were migrating offpost. The installation plans to continue the monitoring program and evaluate the extent of the problems and has requested that USAEHA perform additional health assessment and monitor well tests at this area.

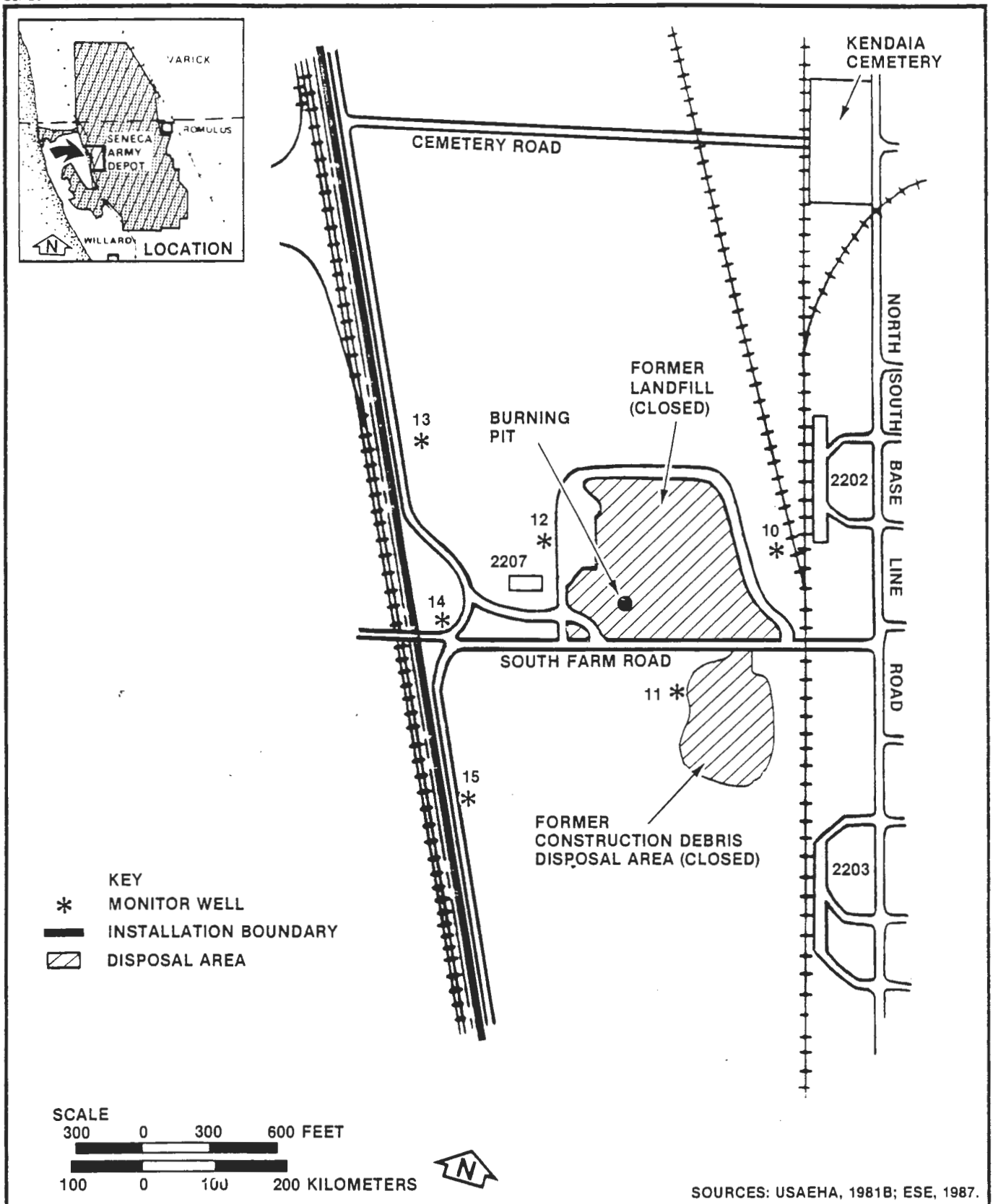


Figure 2-2
LOCATIONS OF MONITOR WELLS IN THE VICINITY OF THE FORMER LANDFILL, BURNING PIT, AND CONSTRUCTION DEBRIS DISPOSAL AREAS

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

2.3.4 PITCHBLENDE STORAGE AREA

The IIA indicated that SEAD was in the process of developing a program for decontaminating the E800 row of igloos (Area 12 on Fig. 2-1). The 11 igloos that stored pitchblende in the 1940s were radiologically surveyed by Oak Ridge National Laboratory for the U.S. Department of Energy (DOE). The survey indicated no health hazards existed; however, the radiation levels present were in excess of allowable concentrations which would permit unrestricted use of the igloos and surrounding areas.

Seneca Army Depot, responding to the results of the radiological survey, developed a Plan for Reclamation (PFR) of the E800 row of igloos in 1985. In the summer of 1986, SEAD carried out the cleanup actions defined in the PFR. Seneca Army Depot removed contaminated soils and residues around the igloos and vacuum blasted the concrete on the interior of the igloos. All materials collected at the area were disposed of under U.S. Nuclear Regulatory Commission (NRC) regulations. The residues were transported to a disposal site located in Barnwell, SC.

As stated in the PFR, SEAD coordinated cleanup activities with the New York State Health Department (NYSHD). Reportedly, NYSHD is satisfied with SEAD's performance on decontamination of the E800 row of igloos. Seneca Army Depot documented the cleanup activities on videotape. Seneca Army Depot is pleased with the results of this cleanup action and is establishing the PFR as a blueprint for any future decontamination action which may be required on the installation.

2.3.5 HERBICIDE USAGE

Seneca Army Depot currently uses Borocil as a soil sterilant for total elimination of vegetation in high security areas. In the past, SEAD had used a number of herbicides for this purpose, as is indicated in the IIA. The installation pest management program is periodically monitored by USAEHA. A pesticide monitoring survey at SEAD (USAEHA, 1984a) evaluated

the distribution of pesticides in various components of the environment. The survey found that the residues present in soil samples at SEAD are typical of normal environmental levels (where pesticides are used) and thus pose no significant concern. The survey recommended that SEAD continue efforts to assure proper handling of pesticides.

2.3.6 RADIOLOGICAL WASTE BURIAL AREAS

The IIA indicated the existence of three potential radiological burial areas at SEAD. All three areas have been investigated by SEAD personnel. Two of the areas were surveyed and did not contain any radiological materials. Buried materials were discovered and excavated from the other area. The excavated materials, which reportedly had some low-level radiological contamination, are awaiting disposal with materials from other Army installations. Current surface-level readings indicate that all radioactive contamination has been removed from the disposal area.

Per Safety ofc / Tom Stivcic
material was shipped
2 & 3 DEC 1987

called him 23 July 92

3.0 ENVIRONMENTAL PROBLEMS IDENTIFIED AND OTHER CHANGES SUBSEQUENT TO THE 1980 INSTALLATION ASSESSMENT OF SENECA ARMY DEPOT

3.1 ENVIRONMENTAL PROBLEMS

3.1.1 ORE STORAGE

Table 3-1 is a list of materials being stored at SEAD that are owned by GSA. Stockpiles of metal ores make up the largest quantity of the GSA-owned materials. Many of the ore piles are outside (Fig. 3-1) and subject to the weather. There are a few stockpiles, however, that are covered for protection from wind and/or precipitation erosion.

Exposed ore piles were reportedly of some concern due to the possibility that acid rain may leach toxic metals. A review of the ore types indicates they are highly insoluble, even when exposed to atmospheric conditions, including acid rain. Therefore, the ground water would not be expected to be contaminated as a result of leaching from the ore storage areas. The uncovered ore could migrate into the environment through air dispersal of dust particulate or transport of particulate through surface water runoff.

3.1.2 MUNITIONS WASHOUT FACILITY LEACH FIELD

During the period of approximately 1948 to 1963, a munitions washout facility existed in the southwest section of SEAD. Operations at this area included dismantling and removing explosives [e.g., trinitrotoluene (TNT)] from munitions by steam cleaning. The solid explosives removed from the munitions were transported to the burning grounds for thermal destruction. The wastewater generated by the cleaning process, which contained dissolved explosives (TNT, RDX, HMX, and tetryl) and other chemical impurities (trinitrobenzene, heavy metals), was discharged to an area near Bldg. 2084. The wastewater discharged at this location either leached into the ground or flowed into a nearby ditch. The foundation of the washout building is still visible, but no evidence of a leach field can be found.

Table 3-1. List of GSA-Owned Ores and Minerals Stored at Seneca Army Depot

Location (See Fig. 3-1)	Ore/Mineral
1	Silicon Carbide
2	Chromite Ore
	Chromium Ore
3	Aluminum Oxide
4	Ferrochromium Ore
5	Ferro Manganese
6	Zinc (metallic)
7	Rutile (Titanium)
8	Asbestos
9	Antimony
10	Chrome Metal, Electrolyte (ore) (Bldg. 356)
	Chrome Metal, Exothermic (ore) (Bldg. 356)
	Columbite Ore (Bldg. 356)
	Columbium (Bldg. 356)
	Ferrocolombium Ore (Bldg. 356)
	Graphite Powder (Bldg. 356)
	Nickel Ore (Bldg. 356)
	Tantalum Ore (Bldg. 356)
11	Cadmium Ore (Bldg. 357)
	Tannin (Bldg. 357)

Source: ESE, 1987.

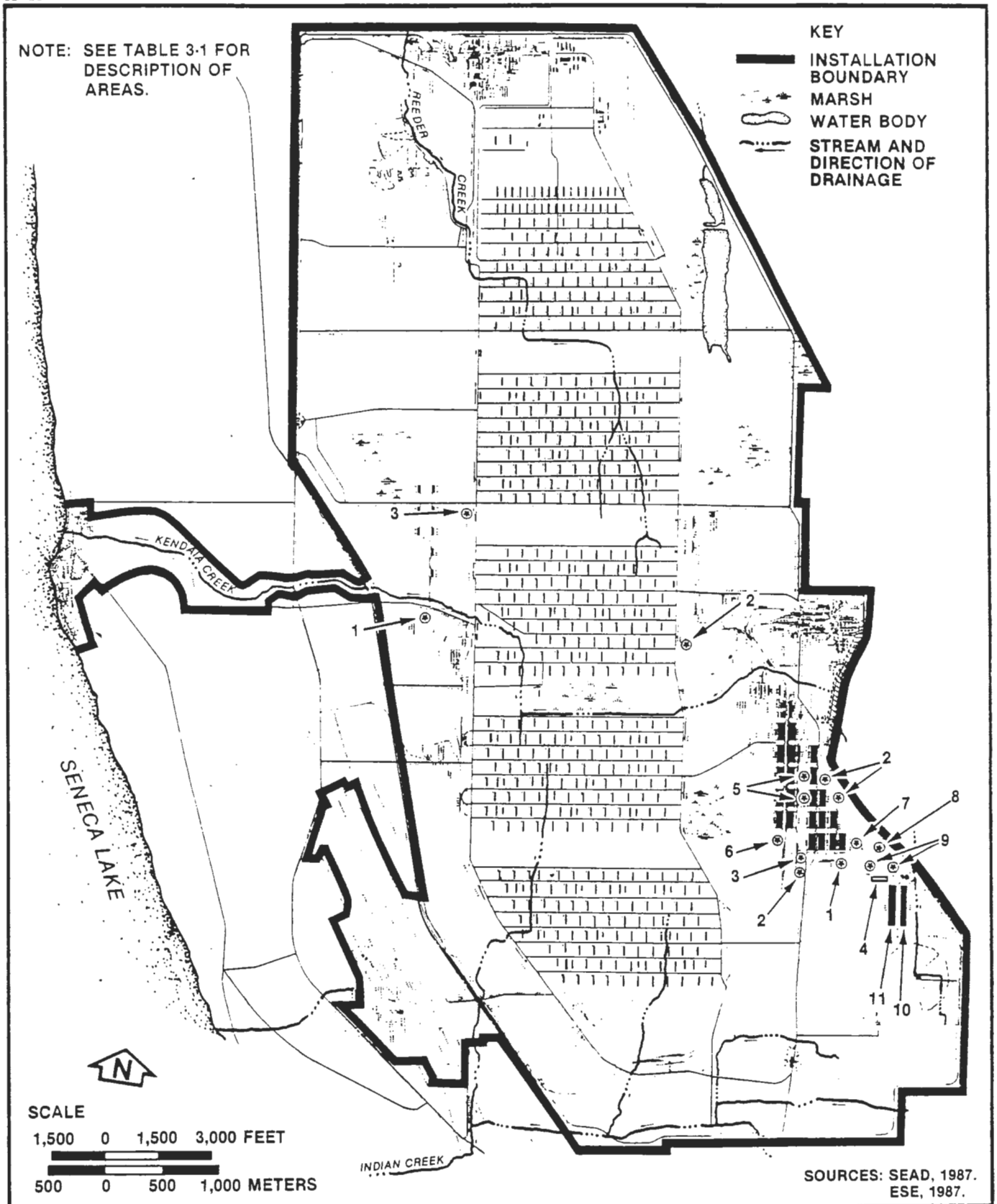


Figure 3-1
LOCATIONS AND TYPES OF MINERALS AND ORE STOCKPILES ON SENECA ARMY DEPOT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

3.2 OTHER SIGNIFICANT CHANGES

3.2.1 PROPOSED LANDFILL

The proposed landfill, as referred to in the IIA (see Area 17 on Fig. 2-1) and located in the southeast corner of the installation, has not become operational to date. The preliminary design has been approved by NYSDEC. A study was conducted (USAEHA, 1980b) to obtain the necessary geological and hydrological data necessary to prepare an application for operating the landfill. Monitor wells have been installed around the perimeter, and samples have been collected and analyzed for drinking water paramaters. No parameters exceeding primary drinking water standards were detected. Additional ground water monitoring, including priority pollutants, may be required if the landfill is opened. The installation has completed and submitted an application to the State for operation of the landfill. The project currently remains in the applied status. The installation currently transports solid wastes offsite because the landfill has not been permitted by NYSDEC; however, SEAD will probably continue to ship the majority of the wastes offsite after the permit is approved.

3.2.2 HAZARDOUS WASTE STORAGE AREA

Subsequent to the IIA and a recommendation from a Hazardous Waste Management Survey (USAEHA, 1980a), SEAD has constructed a hazardous waste storage facility (Bldg. 307). The floor of Bldg. 307 consists of a concrete pad with a 20- to 25-centimeter (cm) berm formed from a monolithic pour. The facility is currently operated under interim status. The application by SEAD for a RCRA Part B operating permit is currently under first-round consideration.

Out-of-service transformers are considered by SEAD to contain polychlorinated biphenyl (PCB) until they are tested. These transformers are stored in Bldg. 301 until testing is complete. Once the transformer oil has been analyzed, it is disposed of in conformance with Federal regulations. Assistance to determine the presence and extent of PCBs at

the installation has been provided by USAEHA (USAEHA, 1981c, 1982a). Solutions for any related technical or administrative problems with PCB also have been provided by USAEHA. Reportedly, SEAD has no significant problems with removal, handling, storage, or disposal of PCB items.

3.2.3 TANK FARM

The tank farm at SEAD consists entirely of aboveground storage tanks. The tanks have been abandoned and are no longer in use. Tank Number 88, as reported in the IIA, is currently used to contain fibrous asbestos. Reportedly, all other tanks are empty; however, some may contain residual fuel. No leaks have been detected or spills reported from any of the tanks since the IIA. The installation is currently planning to disassemble and remove the tanks.

3.2.4 DEACTIVATION FURNACE

The deactivation furnace in Bldg. 367 is operational but has not been used since recent upgrading actions have been initiated. The furnace has a principal discharge stack (equipped with a dust collection system) and a safety pressure release stack. During an inspection in 1985, the furnace was cited for an air violation when the opacity from the safety pressure release stack exceeded 20 percent. At that time, SEAD's permit for the facility did not indicate the presence of the safety pressure release stack. No formal citation was issued for the violation.

Currently, SEAD is applying to revise its operating permit to include the safety release stack and the new facility upgrades. The deactivation furnace is awaiting reinspection, which is scheduled to be completed during the spring or summer of 1987. After this inspection, SEAD hopes to have a new permit-approved furnace operating again.

3.2.5 PESTICIDES

Pesticides are stored in Bldg. 606 at SEAD (Area 3 on Fig. 2-1). An underground tank at this building is used to store rinseates from pesticide operations. In 1984, a Pest Management Review (USAEHA, 1984b) recommended that the underground tank be removed and placed above ground. The installation has since terminated use of this tank. The installation plans to excavate the tank and place it above ground in a concrete pit (to contain any accidental spills or leaks). Once the tank is placed above ground and construction is finished, SEAD plans to resume use of the tank for storing pesticide rinseates. The rinseates are used to formulate subsequent batches of pesticides in accordance with Federal and Army Pesticide Handling Guidelines.

3.2.6 SOLID WASTE MANAGEMENT UNITS

Since the onsite visit to prepare this report, an additional survey to identify, describe, and evaluate Solid Waste Mangement Units (SWMU) has been completed at SEAD. The study identified 41 SWMUs at SEAD (see Table 3-2 and Fig. 3-2). The study recommended that SEAD coordinate the SWMU list with EPA Region II and NYSDEC and implement a sampling program, including SEAD SWMUs 3, 4, 6, 8, 11, 14, 16, 17, 18, 19, 23, 24, 25, and 26.

3.3 POTENTIAL CONTAMINATION AREAS IDENTIFIED FROM AERIAL PHOTOGRAPHIC IMAGERY

The United States Environmental Protection Agency's Environmental Photographic Interpretation Center, under an interagency agreement with USATHAMA, prepared a report in which potential contamination areas on SEAD were identified. These areas (see Fig. 3-3) were identified based on ground staining, ground scarring, pits, revetted areas, aboveground tanks, extraction areas, raw materials piles, smokestacks, equipment storage area, and other signatures which are readily recognizable to photographic imagery experts.

The areas identified by photographic imagery are described in Table 3-3. The study proved very useful in confirming the existence and areal extent of various potential contamination areas identified in the IIA.

Table 3-2. Solid Waste Management Units Designated at Seneca Army Depot

1980 IIA Number*	Seneca Unit Number	Management Unit Designated
NL	SEAD-1	Bldg. 307--Hazardous Waste Container Storage
NL	SEAD-2	Bldg. 301--PCB Transformer Storage
14	SEAD-3	Incinerator Cooling Water Pond
19	SEAD-4	Munitions Washout Facility Leach Field
NL	SEAD-5	Sewage Sludge Waste Pile
14	SEAD-6	Abandoned Ash Landfill
NL	SEAD-7	Shale Pit
15	SEAD-8	Non-Combustible Fill Area
16	SEAD-9	Old Scrap Wood Site
NL	SEAD-10	Present Scrap Wood Site
NL	SEAD-11	Old Construction Debris Landfill
26	SEAD-12	Radioactive Waste Burial Sites (3)
25	SEAD-13	IRFNA Disposal Site
14	SEAD-14	Refuse Burning Pits (2)
14	SEAD-15	Bldg. 2207--Abandoned Solid Waste Incinerator
22	SEAD-16	Bldg. S-311--Abandoned Deactivation Furnace
23	SEAD-17	Bldg. 367--Present Deactivation Furnace
NL	SEAD-18	Bldg. 709--Classified Document Incinerator
NL	SEAD-19	Bldg. 801--Classified Document Incinerator
1	SEAD-20	Sewage Treatment Plant #4
12	SEAD-21	Sewage Treatment Plant #715
13	SEAD-22	Sewage Treatment Plant #314
20,5	SEAD-23	Demolition Ground
NL	SEAD-24	Abandoned Powder Burning Pit
NL	SEAD-25	Fire Training and Demonstration Pad
7	SEAD-26	Fire Training Pit
NL	SEAD-27	Bldg. 360--Steam Cleaning Waste Tank
NL	SEAD-28	Bldg. 360--Underground Waste Oil Tanks (2)
NL	SEAD-29	Bldg. 732--Underground Waste Oil Tank
NL	SEAD-30	Bldg. 118--Underground Waste Oil Tank
NL	SEAD-31	Bldg. 117--Underground Waste Oil Tank
NL	SEAD-32	Bldg. 718--Underground Waste Oil Tanks (2)
NL	SEAD-33	Bldg. 121--Underground Waste Oil Tank
NL	SEAD-34	Bldg. 319--Underground Waste Oil Tanks (2)
NL	SEAD-35	Bldg. 718--Waste Oil-Burning Boilers (3)
NL	SEAD-36	Bldg. 121--Waste Oil-Burning Boilers (2)
NL	SEAD-37	Bldg. 319--Waste Oil-Burning Boilers (2)

Table 3-2. Solid Waste Management Units Designated at Seneca Army Depot (Continued, Page 2 of 2)

1980 IIA Number*	Seneca Unit Number	Management Unit Designated
NL	SEAD-38	Bldg. 2079--Boiler Blowdown Leach Pit
NL	SEAD-39	Bldg. 121--Boiler Blowdown Leach Pit
NL	SEAD-40	Bldg. 319--Boiler Blowdown Leach Pit
NL	SEAD-41	Bldg. 718--Boiler Blowdown Leach Pit

*See Fig. 2-1, page 2-2 of this report.

Note: NL = Not listed during 1980 IIA.

Source: USAEHA, 1987.
USATHAMA, 1980.

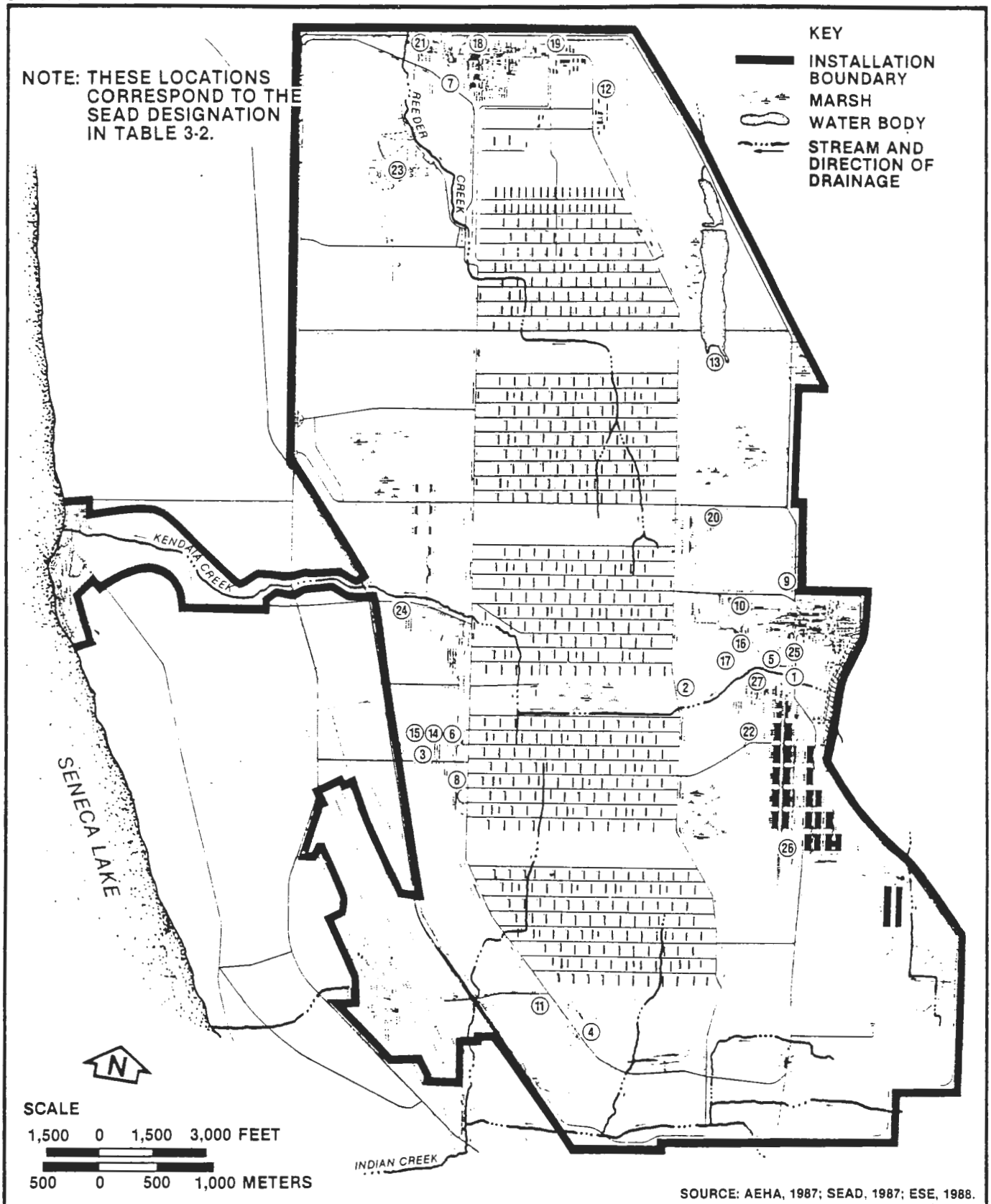


Figure 3-2
LOCATIONS OF SOLID WASTE MANAGEMENT UNITS ON SENECA ARMY DEPOT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

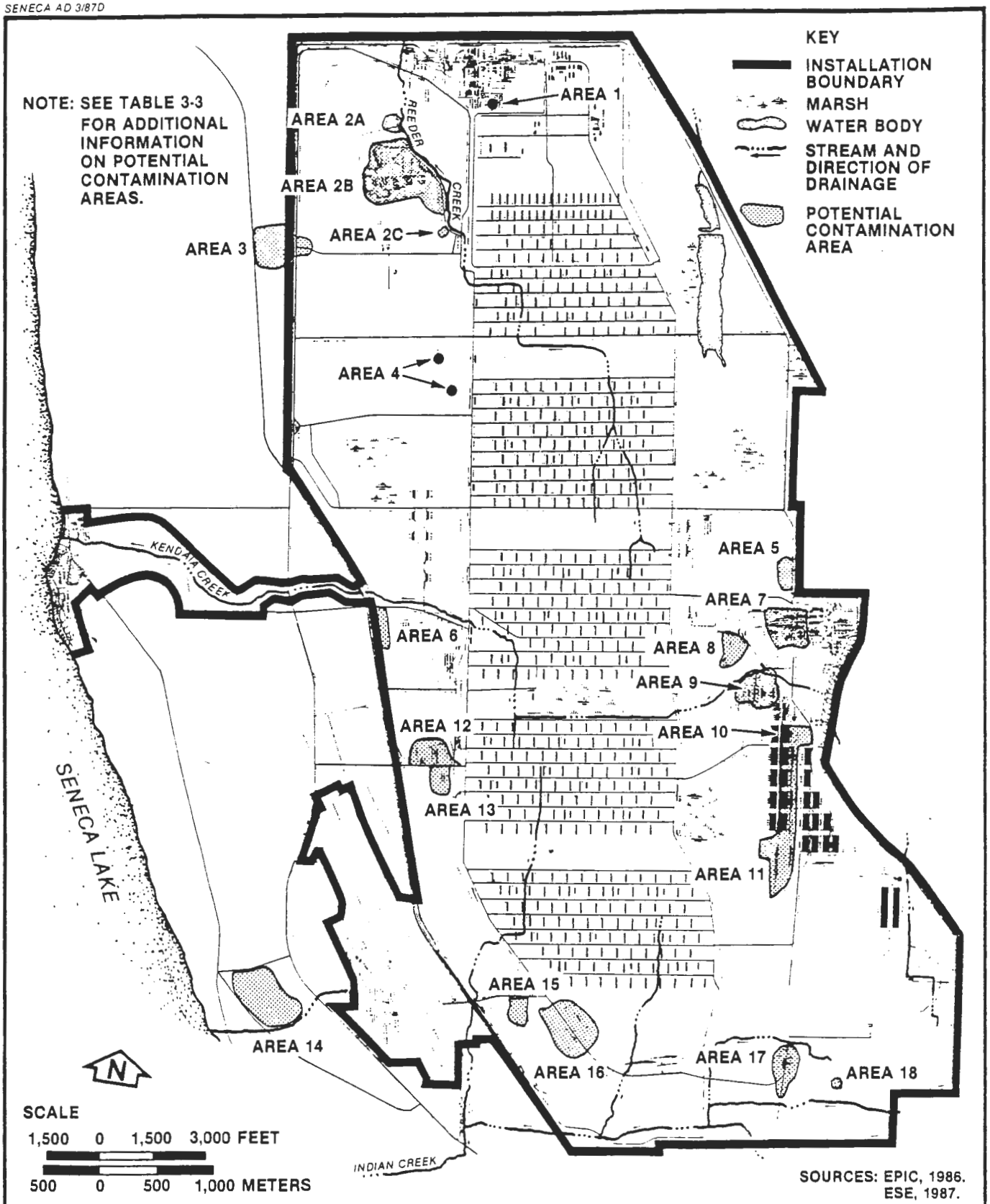


Figure 3-3
POTENTIAL CONTAMINATION AREAS IDENTIFIED FROM AERIAL PHOTOGRAPHIC IMAGERY

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 3-3. Description of Potential Contamination Areas Identified from Aerial Photographic Imagery

EPIC Area Number	EPIC Description of Area	Assessment of Area*
1	Five small rectangular pits, use unknown (pre-1963 to pre-1981)	These areas were not located during the 1987 site visit. SEAD personnel could not provide any information on pits existing in this area. This area was not identified in IIA. The area is currently an athletic field. Available information does not indicate hazardous materials were disposed of at this area.
2A	Five revetted areas, some materials present (pre-1959 to 1981)	Area was used for storage of explosive materials prior to detonation at the demolition area. Identified during the onsite visit were five bermed areas with one area storing empty metal crates or containers. Reportedly, no hazardous materials were disposed of at this location.
2B	Demolition grounds (pre-1954 to date)	Area is the active OB/OD grounds for PEP. This area is described in Sec. 2.3.2. SEAD is not using the area at present. Problems with this area have been assessed by USAEHA; a closure plan for a portion of this area is being pursued by SEAD.
2C	Revetted area containing debris (pre-1954 to 1968)	Area was believed to store dunnage and combustible items used at the open burning grounds area (Area 2B). No hazardous wastes were stored or used at this area.
3	Extraction Area (1954) Landfill (pre-1963 to 1981)	Identified as Varich Landfill by SEAD personnel. SEAD sold the landfill to City of Romulus, then it was closed by the State. No past or current problems were identified at this site.

Table 3-3. Description of Potential Contamination Areas Identified from Aerial Photographic Imagery (Continued, Page 2 of 4)

EPIC Area Number	EPIC Description of Area	Assessment of Area*
4	Extraction Area (pre-1954 to 1981)	No past activity at this area could be identified by SEAD personnel. No problems are expected in this area.
5	Old Fill Area (pre-1954) Landfill (pre-1963 to 1981)	SEAD used area to deposit scrap wood, firewood, and debris from clearing land. No problems were identified with this area during the 1987 visit. Because hazardous materials never have been stored or used in the area, no problems are anticipated.
6	Raw Material Piles (pre-1954 to 1981)	Storage yard. No problems were identified with this area during the 1987 visit. No hazardous materials are used, stored, or disposed of in this area.
7	Rail Line Open Storage Lot (pre-1954 to date)	Area used to store lumber, gravel, stone, and other construction materials. Salt was stored here in the past. No hazardous materials were stored, used, or disposed of in this area, and no problems are anticipated.
8	Storage Area and Old Deactivation Furnace (pre-1954 to mid-1960) New Deactivation Furnace (1962 to date)	Brass shell casings and ammunition boxes stored in this area. New deactivation furnace is described in Sec. 3.2.4. No hazardous wastes are improperly disposed of in this area.

Table 3-3. Description of Potential Contamination Areas Identified from Aerial Photographic Imagery (Continued, Page 3 of 4)

EPIC Area Number	EPIC Description of Area	Assessment of Area*
9	Storage Area (pre-1954 to 1981)	Industrial plant equipment overhaul yard. No problems were identified with this area during the 1987 visit.
10	Debris pile identified in 1981 photographs	Not mentioned in the IIA. A visit to the area and available information do not indicate any hazardous material disposed of in this area.
11	Open Storage Area (pre-1954 to date)	Raw materials are stored in this area. Materials include ores and minerals mentioned in Sec. 3.1.1.
12	Burn Area with debris and pits (pre-1954) Incinerator and Ash Pit (active pre-1963 to 1977)	The incinerator and associated ash pit are described in Sec. 2.3.3. Leachate was detected in monitoring wells, and further testing is proposed.
13	Landfill (pre-1969 to 1981)	The landfill is covered, and no surface cracking was observed. No leachate was seeping from the landfill. This area, along with EPIC Area 12, is considered by SEAD to be one area and described in Sec. 2.3.3.
14	Landfill and Incinerator (pre-1954 to 1981)	This area is located outside the installation property boundary on a former U.S. Navy Training Facility. The area is now part of Sampson State Park. Because this area has never been a part of SEAD, it was not visited during this study.

Table 3-3. Description of Potential Contamination Areas Identified from Aerial Photographic Imagery (Continued, Page 4 of 4)

EPIC Area Number	EPIC Description of Area	Assessment of Area*
15	Landfill (pre-1954 to 1981)	No problems were identified with this area during the 1987 visit.
16	Washout Plant Area with pond receiving liquid from plant (1948 to 1963)	Ammunition workshop described in IIA. Adjacent buildings are dilapidated. Washout plant reportedly discharged red water to surrounding ground. This area was examined by USATHAMA personnel in 1980. The soils in the area were not tested; however, the area was deleted as an area where remedial activities would be required. A recent study by USAEHA indicates additional sampling should be performed because of migration potential (see Section 3.1-2 on page 3-1).
17	Incinerator and Revetted Areas (pre-1954 to 1981)	This is the ammunition breakdown area described in the IIA. No hazardous waste disposal problems were identified at this area during the 1987 visit.
18	Possible landfill with structure identified in 1981 photographs	This area was defined by SEAD personnel as a surveillance testing area for pyrotechnics. No problems were identified with this area during the 1987 visit.

*A ground tour was made to visit each area identified in the EPIC study. The ground at SEAD was covered with snow during the visit, making it very difficult to determine additional information.

Sources: ESE, 1987.
EPIC, 1981.

4.0 1987 EVALUATION OF SENECA ARMY DEPOT

4.1 FINDINGS

4.1.1 SEWAGE TREATMENT

Prior to the IIA, both STPs had intermittent problems meeting NPDES discharge requirements. Upgrades have been completed since the IIA, and performance has improved. Currently, effluent from both STPs is reportedly meeting all NPDES requirements.

The sludge from both STPs has been determined by NYSDEC to contain copper in excess of limits which allow land application. Currently, SEAD is stockpiling the sludge while applying for special consideration of the land application permit. The sludge pile (dimensions 40-ft long, 20-ft wide, and 10-ft high) is covered with plastic to minimize any leaching of heavy metals into the soils while the permit is under consideration.

4.1.2 OPEN BURNING/OPEN DETONATION AREAS

Subsequent to the IIA, OB/OD grounds have been evaluated and reevaluated to determine if contamination exists and if it would potentially migrate. Soil samples exhibited levels of Pb and Ba in excess of EP toxicity limits. Most of the samples also have shown some low-level contamination by munitions-type compounds. Seven monitoring wells were installed by USAEHA as part of the study of the OB/OD area. Ground water monitoring has been conducted since 1983. The results of the monitoring do not indicate that any contaminants at the OB/OD area are entering the ground water.

It was recommended by USAEHA that all burning pads be closed using either a natural clay or synthetic cap. The installation is adopting USAEHA's recommendation.

4.1.3 INCINERATOR/LANDFILL AREA

Monitoring wells were installed around the incinerator (Bldg. 2207) and the adjacent landfill. The presence of indicator compounds (sulfate, chloride, etc.) indicates that contaminants may be migrating in the ground water. A 1986 study by USAEHA determined that TOX was present in a downgradient well. In 1987, USAEHA monitored for volatile pollutants and found trans-1, 2-dichloroethylene, trichloroethylene, and vinyl chloride in wells PT-12 and PT-14 at concentrations which exceed proposed maximum contaminant levels. Because the concentrations in onpost wells exceeded MCL, the installation tested three offpost wells located within 0.3 mile downgradient of the former disposal location. The results of the testing did not indicate contaminants were migrating offpost. The installation plans to continue the ground water monitoring program and evaluate the extent of the problem.

4.1.4 PITCHBLENDE STORAGE AREA

The E800 row of igloos, described in the IIA as a storage area for pitchblende ores in the 1940s, was radiologically surveyed by Oak Ridge National Laboratory for DOE. The levels of contamination which existed were determined to be of no health hazard. However, the levels were in excess of those allowing for unrestricted use of the igloos and surrounding areas. The installation deyeloped a plan for reclamation of the igloos and surrounding areas and performed the clean-up work during the summer of 1986.

4.1.5 HERBICIDE USAGE

The installation currently uses Borocil for total eradication of vegetation in security areas. The SEAD pest management program has been reviewed by USAEHA. Soil samples were collected and analyzed. Soil samples were determined to have residues typical of normal environmental levels and posed no significant concern. The installation has adopted USAEHA recommendations with respect to changes in the pest management program.

4.1.6 RADIOLOGICAL WASTE BURIAL AREAS

The three areas defined by the IIA as potential Radiological Waste Burial Areas have been investigated by SEAD personnel. One of the areas was determined to contain low-level radioactivity and was subsequently excavated, and low-level radioactive contaminated materials were removed. These materials are awaiting consolidation with materials from other Army installations prior to shipment to a disposal area located in Barnwell, SC. Radioactive surveys at the other two areas indicate no signs of contamination.

4.1.7 ORE STORAGE

Large quantities of various ores and minerals are stored in exposed stockpiles on the installation. There was reportedly some concern that acidic rain may release metals from these ore piles into the environment. The potential for solubilizing toxic metals and their subsequent migration into the ground water was examined. It was determined that the solubilities of these ore bodies, even in the presence of dilute acid contained in acid rain, are not sufficient to contaminate the ground water. The ores may migrate into the environment, however, as airborne or water-borne particulate.

4.1.8 PROPOSED LANDFILL

A preliminary design for the proposed landfill has been approved by NYSDEC. The installation has submitted an application to the State for operating the landfill. The application is currently under review by NYSDEC and has not been approved. Because it is more desirable to haul solid waste off the installation, SEAD has not requested the State to expedite approval of the landfill operating permit.

4.1.9 HAZARDOUS WASTE STORAGE AREA

Subsequent to the IIA, SEAD has constructed a Hazardous Waste Storage Facility (Bldg. 307). The facility is being operated under RCRA Part B interim status, and the permit application is currently under the first round of consideration. The building conforms with Federal guidelines for hazardous waste storage areas, and no problems are anticipated.

4.1.10 TANK FARM

The Tank Farm at SEAD consists of aboveground storage tanks that are no longer in use. Reportedly, the tanks are empty but may contain residual fuel. The installation is planning to disassemble and remove the tanks.

4.1.11 DEACTIVATION FURNACE

The Deactivation Furnace in Bldg. 367 has recently undergone upgrading and has been temporarily out of service. In 1985, the furnace was cited for opacity in excess of 20 percent from the safety pressure release stack. The installation is revising its permit to include the safety pressure release stack and other modifications. The installation is currently waiting for a reinspection before placing the furnace back into operation.

4.1.12 PESTICIDES

The underground tank adjacent to Bldg. 367, which formerly stored pesticide rinseates, has been taken out of service. The installation plans to excavate the tank and place it above ground.

The installation plans to construct a spill containment pit prior to resuming use of the tank for pesticide rinseate storage.

The rinseate is used for diluting subsequent batches of pesticides.

4.1.13 MUNITIONS WASHSOUT FACILITY LEACH FIELD

During the period from approximately 1948 through 1963, a munitions washout facility was located in the southwest area of SEAD near Bldg. 2084. Operations at this area generated solid wastes (explosives TNT, RDX, HMX, and tetryl) which were disposed of at the burning grounds. Liquid wastewaters (containing dissolved munitions compounds and impurities) generated at this area were discharged to an area near Bldg. 2084. The wastewater discharges either leached into the ground or flowed to a nearby ditch. The soils and the ground water in this vicinity may be contaminated with hazardous compounds.

4.1.14 SOLID WASTE MANAGEMENT UNITS

A study to identify SWMUs was conducted at SEAD by USAEHA subsequent to the onsite visit to prepare the update report. This study considered all areas where hazardous materials had been stored or disposed of and could be releasing hazardous substances to the environment. The study identified 41 areas which could be designated as SWMUs. After a study of each SWMU, it was recommended that sampling programs be developed at SEAD SWMUs 3, 4, 6, 8, 11, 14, 16, 17, 18, 19, 23, 24, 25, and 26.

4.2 CONCLUSION

Available information indicates ground water contamination in the area of the base landfill and former incinerator located at Bldg. 2207, and the potential for ground water contamination in the area of the former Munitions Washout Facility Leach Field.

4.3 RECOMMENDATION

It is recommended that USATHAMA perform an SI.

Since the onsite visit, the Army has adopted a new policy which mandates that all properties will undergo a site characterization using a modified U.S. Environmental Protection Agency Hazard Ranking System. Sites identified at SEAD during the IIA and in this report will be evaluated and ranked during the characterization study.

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APPENDIX A--SEAD PERSONNEL CONTACTED

Name	Title
Randal Battaglia	Environmental Engineer
Thomas Battaglia	Safety Manager

APPENDIX B

GROUND WATER QUALITY DATA FROM THE MONITOR WELLS AT THE FORMER OPEN BURNING/OPEN DEMOLITION AREA

Table B-1.

RUN DATE: 10 DEC 86

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B W5	W4	W6	W1	W3	W2	W7
WATER										
LEVELS (A)	16 SEP 86		FT	115.7	108.3	107.7	107.5	102.5	93.1	99.8
PH(FIELD)	16 SEP 86		PH	7.1	7.0	7.4	6.9	7.0	7.0	7.2
SPEC COND	16 SEP 86	1.	UMC	720.	1160.	690.	880.	960.	820.	600.
SPEC COND	16 SEP 86	1.	UMC	720.	1150.	690.	880.	950.	820.	610.
SPEC COND	16 SEP 86	1.	UMC	710.	1160.	690.	880.	950.	820.	600.
SPEC COND	16 SEP 86	1.	UMC	710.	1150.	690.	870.	950.	810.	600.
TOC	16 SEP 86	.1	MGL	4.9	4.7	5.4	5.4	6.2	4.7	5.2
TOC	16 SEP 86	.1	MGL	5.0	4.8	5.3	5.4	6.2	4.7	5.1
TOC	16 SEP 86	.1	MGL	5.1	4.8	5.5	5.4	6.3	4.9	5.2
TOC	16 SEP 86	.1	MGL	5.0	4.7	5.4	5.2	6.2	4.8	5.1
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6-TNT	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	16 SEP 86	.001	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	16 SEP 86	.030	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	16 SEP 86	.100	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	16 SEP 86	.010	MGL	ND	ND	ND	ND	ND	ND	ND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

Source: USAEHA, 1986.

Table B-2.

RUN DATE: 15 JUN 87

INSTALLATION: SENECA AD, NY

SITE: DEMOLITION GROUNDS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B W5	W4	W6	W1	W3	W2	W7
WATER										
LEVELS (A)	16 MAR 87		FT	118.5	109.8	111.0	110.5	104.9	94.1	102.8
CHLORIDE	17 MAR 87	1.0	MGL	2.0	4.0	4.0	6.0	5.0	3.0	1.0
IRON	17 MAR 87	.10	MGL	ND	ND	ND	ND	ND	ND	ND
MANGANESE	17 MAR 87	.030	MGL	.078#	.275#	ND	ND	ND	ND	ND
PHENOL	17 MAR 87	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	17 MAR 87	1.	MGL	8.	30.	14.	11.	6.	9.	4.
SULFATE	17 MAR 87	2.0	MGL	24.0	255.0&	67.0	160.0	56.0	6.0	27.0
COND(FIELD)	17 MAR 87	1.	UMC	370.	700.	405.	500.	445.	450.	315
COND(FIELD)	17 MAR 87	1.	UMC	380.	695.	405.	500.	445.	445.	310.
COND(FIELD)	17 MAR 87	1.	UMC	375.	705.	400.	500.	440.	440.	315.
COND(FIELD)	17 MAR 87	1.	UMC	375.	700.	400.	495.	440.	450.	315.
PH(FIELD)	17 MAR 87		PH	6.9	7.1	7.5	6.8	7.1	6.9	6.9
PH(FIELD)	17 MAR 87		PH	6.8	7.3	7.4	6.9	7.2	7.0	7.0
PH(FIELD)	17 MAR 87		PH	6.9	7.2	7.4	6.9	7.1	6.9	6.9
PH(FIELD)	17 MAR 87		PH	7.0	7.2	7.4	6.9	7.1	7.1	6.8
SPEC COND	17 MAR 87	1.	UMC	630.	1000.	690.	820.	710.	730.	530
SPEC COND	17 MAR 87	1.	UMC	640.	1000.	670.	820.	720.	730.	530.
SPEC COND	17 MAR 87	1.	UMC	630.	990.	680.	810.	710.	730.	530.
SPEC COND	17 MAR 87	1.	UMC	640.	1000.	680.	820.	710.	740.	530.
TOC	17 MAR 87	.1	MGL	5.0	3.7	3.7	2.2	5.5	4.0	3.6
TOC	17 MAR 87	.1	MGL	5.0	3.6	3.8	2.1	5.6	4.0	3.6
TOC	17 MAR 87	.1	MGL	5.0	3.8	3.7	2.2	5.6	4.0	3.5
TOC	17 MAR 87	.1	MGL	4.9	3.7	3.8	2.3	5.5	3.9	3.5
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
TOX	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND
2,4,6 TNT	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,4-DNT	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
2,6-DNT	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND	ND	ND
RDX	17 MAR 87	.030	MGL	ND	ND	ND	ND	ND	ND	ND
HMX	17 MAR 87	.100	MGL	ND	ND	ND	ND	ND	ND	ND
TETRYL	17 MAR 87	.010	MGL	ND	ND	ND	ND	ND	ND	ND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

& VALUE EXCEEDS A STATE WATER QUALITY STANDARD OR CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PBM - PER 100 MILLILITERS

Source: USAEHA, 1987.

APPENDIX C

GROUND WATER QUALITY DATA FROM MONITOR WELLS IN THE VICINITY OF THE FORMER LANDFILL, BURNING PIT, AND CONSTRUCTION DEBRIS DISPOSAL AREAS

Table C-1.

RUN DATE: 10 DEC 86

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B PT-10	PT-11	PT-12	PT-14	PT-15
WATER LEVELS (A)	16 SEP 86		FT	675.4	650.9	646.0		631.2
ARSENIC	16 SEP 86	.010	MGL	ND	ND	ND		ND
BARIUM	16 SEP 86	.30	MGL	ND	ND	ND		ND
CADMIUM	16 SEP 86	.001	MGL	ND	ND	.001		ND
CHROMIUM	16 SEP 86	.010	MGL	ND	ND	ND		ND
LEAD	16 SEP 86	.005	MGL	ND	ND	.013		ND
MERCURY	16 SEP 86	.2	UGL	ND	ND	.3		ND
SELENIUM	16 SEP 86	.005	MGL	ND	ND	ND		ND
SILVER	16 SEP 86	.025	MGL	ND	ND	ND		ND
CHLORIDE	16 SEP 86	1.0	MGL	62.0	58.0	305.0#		9.0
IRON	16 SEP 86	.10	MGL	ND	ND	ND		ND
SODIUM	16 SEP 86	1.	MGL	49.	56.	56.		31.
SULFATE	16 SEP 86	2.0	MGL	28.0	150.0	404.0#		42.0
PH(FIELD)	16 SEP 86		PH	7.0	7.0	6.7		7.4
SPEC COND	16 SEP 86	1.	UMC	850.	1020.	2300.		540.
SPEC COND	16 SEP 86	1.	UMC	850.	1010.	2300.		540.
SPEC COND	16 SEP 86	1.	UMC	850.	1010.	2300.		540.
SPEC COND	16 SEP 86	1.	UMC	850.	1020.	2250.		540.
TOC	16 SEP 86	.1	MGL	4.6	5.7	5.9		3.2
TOC	16 SEP 86	.1	MGL	4.5	5.6	5.7		3.3
TOC	16 SEP 86	.1	MGL	4.5	5.7	5.8		3.3
TOC	16 SEP 86	.1	MGL	4.5	5.8	5.7		3.3
TOX	16 SEP 86	.010	MGL	ND	ND	.981		ND
TOX	16 SEP 86	.010	MGL	ND	ND	1.087		ND
TOX	16 SEP 86	.010	MGL	ND	ND	1.140		ND
TOX	16 SEP 86	.010	MGL	ND	ND	1.053		ND
POTASSIUM	16 SEP 86	.10	MGL	2.94	2.63	3.52		2.29

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
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PCL - PICOCURIES/LITER
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CU - COLOR UNITS
PHM - PER 100 MILLILITERS

Source: USAEHA, 1986.

Table C-2.

RUN DATE: 15 JUN 87

INSTALLATION: SENECA AD, NY

SITE: LANDFILL

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B PT-10	PT-11	PT-12	PT-14	PT-15
WATER LEVELS (A)	16 MAR 87		FT	675.1	653.8	647.5	635.5	633.0
ARSENIC	17 MAR 87	.005	MGL	ND	ND	ND	ND	ND
BARIUM	17 MAR 87	.05	MGL	.22	.08	.03	.06	.08
CADMIUM	17 MAR 87	.001	MGL	ND	ND	ND	ND	ND
CHROMIUM	17 MAR 87	.020	MGL	ND	ND	ND	ND	ND
LEAD	17 MAR 87	.005	MGL	.055&	.027&	.031&	.023	.038&
SELENIUM	17 MAR 87	.001	MGL	.001	ND	ND	ND	ND
SILVER	17 MAR 87	.020	MGL	ND	ND	ND	ND	ND
CHLORIDE	17 MAR 87	1.0	MGL	70.0	60.0	43.0	16.0	3.0
IRON	17 MAR 87	.10	MGL	ND	ND	ND	ND	ND
SODIUM	17 MAR 87	1.	MGL	49.	57.	43.	18.	32.
SULFATE	17 MAR 87	2.0	MGL	18.0	180.0	50.0	44.0	18.0
COND(FIELD)	17 MAR 87	1.	UMC	545.	690.	1030.	445.	330.
PH(FIELD)	17 MAR 87		PH	7.4	7.2	6.7	6.8	7.3
PH(LAB)	17 MAR 87		PH	6.9	6.9	6.7	6.9	7.2
SPEC COND	17 MAR 87	1.	UMC	810.	1100.	1000.	640.	490.
SPEC COND	17 MAR 87	1.	UMC	810.	1100.	1000.	650.	500.
SPEC COND	17 MAR 87	1.	UMC	810.	1090.	1000.	640.	490.
SPEC COND	17 MAR 87	1.	UMC	800.	1090.	1000.	650.	500.
TOC	17 MAR 87	.1	MGL	2.9	5.0	3.9	4.8	2.4
TOC	17 MAR 87	.1	MGL	2.9	5.0	3.6	4.9	2.2
TOC	17 MAR 87	.1	MGL	3.0	5.1	3.8	5.0	2.3
TOC	17 MAR 87	.1	MGL	2.8	5.0	3.9	5.0	2.2
TOX	17 MAR 87	.010	MGL	ND	.021	.745	.198	ND
TOX	17 MAR 87	.010	MGL	ND	.028	.738	.183	ND
TOX	17 MAR 87	.010	MGL	ND	.018	.748	.182	ND
TOX	17 MAR 87	.010	MGL	ND	.020	.664	.186	ND
NITRATE N	17 MAR 87	.01	MGL	.22	.42	.10	.38	.37
POTASSIUM	17 MAR 87	.10	MGL	2.46	2.17	2.33	3.38	1.94

Table C-2 (Continued, Page 2 of 2).

RUN DATE: 15 JUN 87

INSTALLATION: SENECA AD, NY SITE: LANDFILL

COMPOUNDS ANALYZED AND DETECTION LIMITS(UGL)

PURGEABLE ORGANIC COMPOUNDS		Well PT-12	Well PT-14
BENZENE	5.0	<5	<5
CARBON TETRACHLORIDE	5.0	<5	<5
CHLOROBENZENE	5.0	<5	<5
1,2-DICHLOROETHANE	5.0	<5	<5
1,1,1-TRICHLOROETHANE	5.0	<5	<5
1,1-DICHLOROETHANE	5.0	<5	<5
1,1,2-TRICHLOROETHANE	5.0	<5	<5
1,1,2,2-TETRACHLOROETHANE	5.0	<5	<5
CHLOROETHANE	5.0	<5	<5
2 CHLOROETHYLVINYL ETHER	5.0	<5	<5
CHLOROFORM	5.0	<5	<5
1,1-DICHLOROETHYLENE	5.0	<5	<5
TRANS-1,2-DICHLOROETHYLENE	5.0	570	100
1,2-DICHLOROPROPANE	5.0	<5	<5
CIS-1,3-DICHLOROPROPENE	5.0	<5	<5
TRANS-1,3-DICHLOROPROPENE	5.0	<5	<5
ETHYLBENZENE	5.0	<5	<5
METHYLENE CHLORIDE	5.0	<5	<5
CHLOROMETHANE	5.0	<5	<5
BROMOMETHANE	5.0	<5	<5
BROMOFORM	5.0	<5	<5
BROMODICHLOROMETHANE	5.0	<5	<5
TRICHLOROFLUOROMETHANE	5.0	<5	<5
DIBROMOCHLOROMETHANE	5.0	<5	<5
TETRACHLOROETHYLENE	5.0	<5	<5
TOLUENE	5.0	<5	<5
TRICHLOROETHYLENE	5.0	540	160
VINYL CHLORIDE	5.0	11	<5

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

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& VALUE EXCEEDS A STATE WATER QUALITY STANDARD OR CRITERIA

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PHM - PER 100 MILLILITERS

Source: USAEHA, 1987.