FINAL REPORT

PRELIMINARY ASSESSMENT SCREENING

STRATFORD ARMY ENGINE PLANT

STRATFORD, CONNECTICUT

U. S. Army Aviation Systems Command

Prepared for
U.S. Department of the Army
Corps of Engineers, Omaha District
Omaha, Nebraska

December, 1991

Woodward-Clyde

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Proposal No. 89MC114M

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NOTICE

Woodward-Clyde Consultants' (WCC) site survey was completed at the Stratford Army Engine Plant from March 11 to March 26, 1991. The accomplishment of compiling information for this study could not have been made in that time period without the full cooperation of Government representatives and Textron Lycoming Stratford (TLS) representatives. Appreciation and gratitude are expressed to AVSCOM, USACE, and TLS personnel.

Findings and observations reported in this study are those of the WCC project team, and they are based on available information collected within the time limits of the project. The views, opinions, and findings contained in this report are those of the authors, and should not be construed as official Government or TLS position, policy, or decision, unless so designated by other documentation.

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LIST OF ACRONYMS

ACM	Asbestos Containing Material
AHERA	Asbestos Hazard Emergency Response Act
AMC	(United States) Army Materiel Command
AR 200-1	(United States) Army Regulation 200-1
AVSCOM	(United States) Army Aviation Systems Command
BOD	Biochemical Oxygen Demand
CAA	Clean Air Act
CO	Carbon Monoxide
CCMP	Comprehensive Conservation and Management Plan
CDF	Cyanide Destruction Facility
CEMO	Commercial Engine Maintenance Operations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFE	Connecticut Fund for the Environment
CWA	Clean Water Act
CWTP	Chemical Waste Treatment Plant
dBA	Decibals
DEP	(Connecticut) Department of Environmental Protection
DMR	Discharge Monitoring Reports
DO	Dissolved Oxygen
DOD	(United States) Department of Defense
DOT	(United States) Department of Transportation
DRMO	Defense Reutilization and Marketing Office
DTE	Discharge Toxicity Evaluation
EAI	Environmental Audit, Inc.
ECM	Electrochemical Machining
EIS	Environmental Impact Statement
EPA	(United States) Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act

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ESA	Endangered Species Act
ESE	Environmental Science and Engineering
F	Fahrenheit
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS	Facility Index Database System
FIT	Field Investigation Team
FONSI	Finding of No Significant Impact
gal	Gallon
gpd	Gallons Per Day
GW	Groundwater
GWM	Groundwater Monitoring
HWM	Hazardous Waste Management
IAQCR	Interstate Air Quality Control Region
ICBM	Intercontinental Ballistic Missile
ICUZ	Installation Compatible Use Zones
INEL	Idaho National Engineering Laboratory
IWC	Instream Waste Concentration
kg	Kilogram
kg/mo	Kilograms Per Month
LC_{50}	Lethal Concentration for 50 Percent of Population
Ldn	Day-Night Sound Level
mg/l	Milligrams Per Liter
mrem/hr	Millirem per hour
MSL	Mean Sea Level
NEP	National Estuary Program
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NOAA	National Oceanic and Atmospheric Administration
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System

NRC	Nuclear Regulatory Commission
NRDC	National Resources Defense Council
O_3	Ozone
OATP	Oil Abatement Treatment Plant
OF	Outfall
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbon
PAS	Preliminary Assessment Screening
PCB	Polychlorinated Biphenyl
PCE	Tetrachlorethene or Tetrachloroethylene
ppm	Part Per Milliion
RCRA	Resource Conservation and Recovery Act
SAEP	Stratford Army Engine Plant
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
semi-VOC	Semivolatile Organic Compound
SI	Site Inspection
SIP	(Connecticut) State Implementation Plan
SOP	Standard Operating Procedure
SPL	(Connecticut) Superfund Priority List
STP	Sewage Treatment Plant
SW	Surface Water
T&E	Threatened and Endangered Species
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene or Trichlorethylene
TESS	Textron Environmental Self-Survey
TLS	Textron Lycoming, Stratford Division
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
TTO	Total Toxic Organics
USACE	United States Army Corps of Engineers

USDA	United States Department of the Army
UFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WCC	Woodward-Clyde Consultants

The Stratford Army Engine Plant (SAEP) is a government-owned contractor-operated facility located in Stratford, Connecticut. The U.S. Department of the Army (USDA) owns the land, the buildings, and some of the production equipment at SAEP. The U.S. Army Aviation Systems Command (AVSCOM) has responsibility for the jurisdiction, control, and accountability of SAEP. Textron Lycoming, Stratford Division (TLS) operates SAEP under a facilities contract with AVSCOM. USDA is currently considering the lease or sale of government-owned property at SAEP to TLS. U.S. Army Regulation 200-1 (AR 200-1) requires that Preliminary Assessment Screening (PAS) be completed for any real property for which a transaction is being proposed. The purpose of this PAS is to determine the Army's potential liabilities associated with the environmental condition of SAEP. Once such liabilities are known, AVSCOM can decide to proceed with or discontinue the property transaction.

The U.S. Army Corps of Engineers (USACE) has been tasked by AVSCOM to complete the Preliminary Assessment Screening for SAEP. The USACE has contracted the PAS to Woodward-Clyde Consultants (WCC) under Indefinite Delivery Contract No. DACW45-90-D-0008. The existence of or potential for environmental contamination is determined in the PAS, and the need for additional investigations, if warranted, is identified. The activities that were completed by WCC included the following:

- Review of SAEP records, including reports, engineering drawings, and historical photographs
- Interviews with SAEP personnel and retirees who are familiar with current and past site activities
- Visual reconnaissance of the site and areas immediately adjacent to the site
- Collection of information pertaining to the site or adjacent areas from public organizations.

SITE DESCRIPTION AND HISTORY

SAEP is located in Stratford, Connecticut, on the Stratford Point peninsula in the southeast corner of Fairfield County. The Army-owned property at SAEP consists of about 126 acres, of which about 76 acres are improved land and 50 acres are riparian rights. The riparian rights property consists of intertidal flats of the Housatonic River; of which an estimated 2 acres is a causeway constructed in the 1930s to provide access to the river channel. An estimated 10 acres of land along the Housatonic River consists of man-placed fill over what was once intertidal flats.

The plant is bounded by: a paved parking lot and wetlands to the north; the Housatonic River to the east; open field, a drainage ditch, and small commercial businesses to the south; and a hangar building, the Sikorsky Memorial Airport, several small businesses, and Frash Pond to the west.

Historically, land in the SAEP vicinity has been used for agricultural and residential purposes. At present, local agricultural activities on land are practically nonexistent. The primary agricultural (aquaculture) activity in the area involves growing oysters in shallow waters of the Housatonic River. Shellfishing is an important commercial industry in this area. The SAEP property is zoned light industrial, and land in the vicinity of SAEP is zoned light industrial, business, commercial, or residential.

The SAEP site has been used to develop, manufacture, and assemble aircraft or engines since 1929, and the plant history has been categorized into the following periods:

- 1929 to 1939. Sikorsky Aero Engineering Corporation/Sikorsky Aviation Corporation developed and manufactured sea planes at the Stratford plant from 1929 to 1939.

- 1939 to 1948. Chance Vought Aircraft located its operations at the Stratford plant in 1939, and the company became known as Vought-Sikorsky Aircraft Division. Sikorsky developed the helicopter, and left the plant in 1943 because of overcrowding. Chance Vought developed the "Corsair" for U.S. Navy, and mass produced Corsairs during World War II. Chance Vought vacated the Stratford plant in 1948.

- 1948 to 1951. The Stratford plant was idle.

- 1951 to 1976. The U.S. Air Force procured the plant in 1951 and named it Air Force Plant No. 43. The Avco Corporation was contracted by the Air Force to operate the plant. Avco manufactured radial engines in the 1950s for aircraft and developed and manufactured turbine engines in the 1960s and 1970s, primarily for aircraft.

- 1976 to Present. The plant was transferred from the U.S. Air Force to the Army in 1976; at that time the plant was renamed the Stratford Army Engine Plant. Avco was contracted by the Army to develop the AGT-1500 engine to power the Abrams tank. Avco also developed and manufactured aircraft, marine, and industrial engines. Avco merged with Textron in December 1985 and subsequently formed the Textron Lycoming Stratford Division. Today, turbine engines for military and commercial aircraft as well as land vehicles, continue to be developed, manufactured, and tested at SAEP.

The primary types of waste generated at SAEP before the 1950s are believed to have been waste oils, fuels, solvents, and paints. Since 1951, most of the wastes generated at SAEP have resulted from engine production operations such as plating, metal working, and finishing, and cleaning. Wastes were also generated as a result of engine and engine component testing, research and development, raw materials testing, vehicle and other maintenance, and on-site treatment.

ENVIRONMENTAL SETTING

A review of environmental setting information for the SAEP site and vicinity identified the following:

- Almost all the land at SAEP is less than 10 feet above mean sea level. The exception to this is a dike which has been constructed along the Housatonic River for flood protection. SAEP is within the 100-year floodplain, and the site was flooded in 1951 and 1968.

- Surface water bodies in the site vicinity include: Long Island Sound, the Housatonic River, Frash Pond, and the Marine Basin and drainage ditch. Long Island Sound receives all of the region's drainage, in large part via the Housatonic River.

- Most of the SAEP surface is paved or covered with buildings. Thus, there is little infiltration and heavy runoff during storm events. Most of the precipitation that falls on SAEP is drained to the Housatonic River. Storm drainage is pumped through the oil abatement treatment plant except in times of heavy precipitation when some runoff is pumped directly to the Housatonic River.

- The Bridgeport Hydraulic Company supplies the cities of Bridgeport and Stratford with potable water from the Trap Falls Reservoir located in Shelton, Connecticut, about 6.5 miles north-northwest (upgradient) of SAEP. In 1989, the Trap Falls Reservoir supplied drinking water to 99.9 percent of the populations of Bridgeport and Stratford, including residents in the immediate area of SAEP.

- Bedrock at the site reportedly ranges from about 100 to 150 feet below the land surface. The site's shallow geology is characterized by five distinct units: sand, gravel and debris fill material; highly organic silt and peat (tidal inlet or marsh deposits); silt and sandy silt alluvium associated with the peat; estuarine silt; and stratified drift consisting of outwash sand with some gravel and ice-contact sand, gravel, cobble deposits.

- Stratified drift deposits (sand and sand/gravel) form the upper aquifer at the SAEP which may be up to 150 feet thick. This aquifer contains fresh water but no information was found to indicate whether a salt water wedge typical of coastal environments is present. Water wells for drinking supply or other domestic uses are reportedly not present in the SAEP vicinity.

- Freshwater wetlands, intertidal flats, and tidal marshes occur in the vicinity of SAEP or on site. Freshwater wetlands in the vicinity are associated with Frash Pond, Salby Pond, and a small acreage of land that abuts the SAEP property to the north. Intertidal flats in the vicinity are located in a band along the shoreline of the Housatonic River and Long Island Sound. SAEP's riparian rights encompass an estimated 51 acres of intertidal flats. Large areas of tidal marshes occur in the site vicinity, including areas along the Housatonic River, Nells Island, land around Sikorsky airport, and the Great Meadow Salt Marsh.

- No federally-listed threatened and endangered mammal, amphibian, invertebrate, aquatic, or plant species have been reported to occur in the vicinity of SAEP. Two federally-listed and 11 stated-listed threatened, endangered, or special concern birds have the potential to occur in the vicinity of SAEP. The two federally-listed species include the piping plover and Roseate tern, and the intertidal flats area of SAEP may be feeding areas for them.

- Two prehistoric archeological sites are reportedly located on SAEP property. In addition, an Indian burial site may be located on site.

- Short Beach Park is located 1 mile south of SAEP, and there are three marinas within 2 miles of SAEP.

ENVIRONMENTAL COMPLIANCE

Federal facilities must, in general, comply with all state and local statutes, regulations, and ordinances. Government-owned contractor-operated facilities such as SAEP do not qualify for some of the exemptions that exist for other federal facilities. A review of SAEP's environmental compliance history, its current compliance status, and future compliance issues for SAEP identified the following:

Hazardous Waste

- SAEP receives occasional Letters of Warning for incomplete manifests.

- The groundwater monitoring system has detected significant increases of chlorinated hydrocarbons in groundwater at the site.

- SAEP appears to be in compliance with requirements for installation of monitoring wells near the closed lagoon system.

- Compliance action is complete on improper manifesting of hazardous waste (sludge) shipments to Canada and has been settled.

- Since groundwater contamination has been detected, further study of groundwater movement and contaminant migration will likely be required by the state, with U.S. Environmental Protection Agency (EPA) oversight.

- A corrective measures study and groundwater cleanup could be required by the state.

- Hazardous waste unit closure of the drum storage area could result in the requirement of installation of additional monitoring wells.

Wastewater

- Discharge limits for Total Toxic Organics (Outfall 008), heavy metals (Outfall 008), cyanide (Outfall 008a), and flow (Outfalls 007 and 008) are occasionally exceeded.

- Draft NPDES permit (renewal) is nearly finalized.

- SAEP's draft NPDES permit adds significant new requirements for aquatic toxicity testing and limitations. Effluent samples will be tested to determine their degree of toxicity to test organisms. Compliance with concentration requirements does not guarantee compliance with toxicity requirements, and both requirements must be met.

- Sources should be investigated for solvents found in effluents, especially for those chemicals that are not reportedly used at SAEP.

- Sediments near discharge points should be sampled to determine whether discharge has caused or is contributing to contamination of sediments.

Drinking Water

- SAEP appears to be in compliance with Safe Drinking Water Act (SDWA) requirements. No future issues were identified.

Air

- SAEP must determine whether it is in compliance with National Emission Standards for Hazardous Air Pollutants (NESHAPs) requirements for radionuclides. Amended Clean Air Act (CAA) regulations, effective in 1990, limit the amount of radionuclides emitted into the ambient air at facilities with Nuclear Regulatory Commission (NRC) licenses.

- Resolution of the compliance action on asbestos is pending and is planned for completion by July 1, 1991.

- SAEP must determine whether it is a "major stationary source" of volatile organic compounds or oxides of nitrogen. These types of sources will be strictly regulated by the Clean Air Act (CAA) amendments of 1990 in areas of high levels of ozone pollution, such as the Stratford area.

- Implementation of the CAA amendments will require modifications to the present employee carpooling program or other trip reduction measures because of high ambient concentrations of ozone and carbon monoxide.

PCBs

- SAEP appears to be in compliance with Toxic Substance Control Act (TSCA) requirements regarding polychlorinated biphenols (PCBs). SAEP will phase out PCB and PCB-containing transformers through facility upgrade projects and/or as required by regulatory agencies.

Noise

- Present compliance status could not be determined. The latest Installation Compatible Use Zone (ICUZ) study was conducted in 1985, when off-site noise levels were found to be excessive. It is not known whether test cell renovation and altered operational schedules have resulted in acceptable noise levels.

- No plans for development of new noise-sensitive uses near SAEP were discovered.

- Identification of other future compliance status or issues would have to be based on the results of an updated ICUZ study.

Endangered Species

- SAEP's status of compliance with the Endangered Species Act (ESA) and/or the National Environmental Policy Act (NEPA) could not be determined. No information was available indicating that any site-specific field studies have been conducted at SAEP to detect the presence of endangered plant or animal species and to assess the effects of SAEP activities [such as construction or chemical wastewater treatment plant (CWTP) renovation] on them.

- Corrective measures for groundwater and/or soil contamination would require a detailed assessment of potential harm to endangered species from cleanup alternatives, including the no action alternative.

Radioactive Materials

- No compliance letters from the NRC or EPA were found in the files.

- SAEP's NRC license is in the renewal process at this time.

- SAEP must determine whether it is in compliance with NESHAPs requirements for radionuclides. Amended CAA regulations, effective in 1990, limit the amount of radionuclides emitted into the ambient air at facilities with NRC licenses.

SITES OF POTENTIAL ENVIRONMENTAL CONCERN

Eight areas of the SAEP property have been identified where there is potential for environmental contamination caused by operational or waste disposal practices (see Figure 1):

- Area 1 - Intertidal Flats. This 48.5 acre area is a site runoff and effluent depositional area; it is not a past or current site operational area. There is concern in this area for potential contamination of sediments and surface waters caused by release and deposition of metals, cyanide, fuel and oil, and solvents.

- Area 2 - Causeway. This 2.1 acre area consists of man-placed fill over the intertidal flats, and it is currently nonoperational. The causeway has reportedly been used in the past for disposal of asbestos containing materials and for fire training; however, asbestos disposal has not been verified. There is concern in this area for potential contamination of soil caused by burning and disposal of asbestos and unknown fill.

- Area 3 - Shoreline Fill Area. This 13.6 acre area is located along the Housatonic River shoreline, and most of this area was hydraulically filled using river sediments. This area has been or is currently used for: storing fuels, oils, solvents, and wastes; testing engines and engine components; and treating wastewater. There is concern in this area for potential contamination of soil and groundwater caused by release or disposal of metals, fuels and oils, and solvents.

- Area 4 - Plating and Manufacturing. This 8.7 acre area is located in the central portion of the site, and includes the plating room in B-2 and the former plating room in B-3. This area has also been used for storing paints and solvents, fuels and oils, and cleaning engines. There is concern in this area for potential contamination of soil and groundwater caused by release or disposal of metals, cyanide, fuels and oils, and solvents.

- Area 5 - Building 2. This 18.8 acre area includes most of B-2 (excluding the plating and heat treating shops). B-2 is the primary manufacturing building on the plant, and it has been used for aircraft assembly. It is not known if disposal of wastes occurred beneath the northern area of B-2 before it was constructed. There is concern in this area for potential contamination of soil and groundwater caused by release or disposal of metals, fuels and oils, and solvents.

- Area 6 - Research and Development. This 3.9 acre area houses most of the plant's research and development activities, including a materials testing laboratory. There is concern in this area for potential contamination of soil and groundwater caused by release or disposal of metals, fuels and oils, and solvents.

contamination of soil and groundwater caused by release or disposal of metals, fuels and oils, and solvents.

- Area 7 - Testing. This 5.5 acre area has been used for experimental testing of engines. The area has some fuel storage and a steam plant formerly operated in this area. There is concern in this area for potential contamination of soil and groundwater caused by release or disposal of metals, fuels and oils, and solvents.

- Area 8 - Drainage Ditch. This 0.2 acre area is located off site, and it has received effluent from the chemical waste treatment plant since 1958. There is concern in this area for potential contamination of soils, sediments, and surface waters caused by release and deposition of metals, cyanide, fuels and oils, and solvents.

EXPOSURE ASSESSMENT

Information obtained during this study was not adequate to establish whether any complete pathway to human or biota receptors exist. Because most of the site is occupied by buildings or pavement and groundwater in the vicinity of SAEP is not used, the number of potential pathways are reduced. Based on potential pathways, it would appear that workers associated with intrusive activities at SAEP would likely represent the primary human receptors. Biota organisms within the intertidal flats and the Marine Basin drainage ditch probably have the highest potential to be affected by chemicals of concern from SAEP.

RECOMMENDATIONS

Potential contaminants that may have been released to the environment at SAEP have been assessed for possible exposures to humans or biota, and each of the eight sites were found to have the potential to impact these populations. Based on this records search, inadequate data are available at this time to identify site-specific contaminants or to conduct a risk assessment. Since the sites have potential to cause environmental disruption, but inadequate data are available to identify environmental contamination, a sampling phase investigation is warranted for each of the eight identified areas at SAEP. There is potential for asbestos containing materials in buildings at SAEP, and an asbestos survey is also warranted.

Recommendations for future remedial work at SAEP include the following:

- A sampling phase study is recommended for the eight identified areas of potential contamination (see Figure 1).

- An asbestos survey including inspection and confirmation sampling is recommended to identify the location and quantities of asbestos containing materials.

The sampling phase study should focus on the source and/or secondary source media identified by this study. The transport pathways and potential exposure (or release) points should be addressed, with emphasis on "sensitive" populations (e.g., threatened or endangered species). Chemical analyses should be limited to those chemicals which are: (1) potentially toxic to humans and/or biota, and (2) have EPA defined critical toxicity criteria. At this time, the site hydrogeology is inadequately defined, i.e., groundwater movement patterns and tidal influences on groundwater are not known on a site-wide basis at this time. A hydrogeologic study of the site is necessary because contaminant migration in groundwater is a potential pathway.

1.0
INTRODUCTION

1.1 BACKGROUND AND AUTHORITY

The Stratford Army Engine Plant (SAEP) is a government-owned contractor-operated facility located in Stratford, Connecticut. The U.S. Department of the Army (USDA) owns the land, the buildings, and some of the production equipment at SAEP. The U.S. Army Aviation Systems Command (AVSCOM) has responsibility for the jurisdiction, control, and accountability of SAEP. Textron Lycoming Corporation operates SAEP under a facilities contract with AVSCOM. Textron Lycoming, Stratford Operations (TLS) manufactures and tests turbine engines, primarily for the Department of the Army. TLS also produces turbine engines for the U.S. Navy, for foreign military sale, and for commercial use.

The USDA has adopted the position that it may sell a government-owned facility on the basis that it is "excess to ownership." A facility may be considered excess to ownership if it is not necessary for the government to own the facility, although the production capacity of the facility may be required. USDA is currently considering the lease or sale of government-owned property at SAEP to TLS. U.S. Army Regulation 200-1 (AR 200-1) requires that Preliminary Assessment Screening (PAS) be completed for any real property for which a transaction is being proposed.

The U.S. Army Corps of Engineers (USACE) has been tasked by AVSCOM to complete the PAS for SAEP. The USACE has contracted Woodward-Clyde Consultants (WCC), under Indefinite Delivery Contract No. DACW45-90-D-0008 to complete the PAS.

1.2 PURPOSE AND SCOPE

The purpose of this PAS is to determine the Army's potential liabilities associated with the environmental condition of SAEP. Once such liabilities are known, AVSCOM can decide to proceed with or discontinue the property transaction. WCC was retained by USACE to complete the PAS for SAEP. This report contains a summary and evaluation of the information collected during the PAS, and recommendations for follow-up actions. Information was collected to outline the type and extent of the real property transaction being considered, to generally describe the environmental setting, and to identify and evaluate subject areas of concern. The activities that were completed by WCC included the following:

- Review of SAEP records, including reports, engineering drawings, and historical photographs

- Interviews with SAEP personnel and retirees who are familiar with current and past site activities

- Visual reconnaissance of the site and areas immediately adjacent to the site

- Collection of information pertaining to the site or adjacent areas from public organizations.

The methodology of the PAS began with reviewing past and current industrial activities at SAEP. Information was obtained from available engineering drawings and plant operations reports, as well as from interviews with 31 past or current employees of TLS. Those interviewed included personnel from the environmental, plant engineering, engineering, maintenance, manufacturing, law, and special projects departments at SAEP. A listing of interviewees with their position and number of years experience at SAEP is provided in Appendix B.

During the site records review and interviews, attention was concentrated on identifying past and present sources of hazardous materials/substances/wastes and fuels/oils, and on past management practices regarding the use, storage, treatment, and disposal of such materials. Included in this effort was the identification of spill or disposal areas on site.

A general site tour was made by the WCC field team to gain an overall impression of the plant layout and surface conditions. Following this general site tour, site reconnaissance activities focused on potential areas of concern identified by records review and/or interviews. The site reconnaissance was photodocumented, and the photographs and corresponding logs are provided in Appendix A. Specific information gathered during site reconnaissance included: observation of site surface conditions and "housekeeping"; presence of storage tanks or drums; presence of drainage features; observation of treatment facilities; observation of production facilities; and signs of environmental stress or obvious signs of contamination.

Concurrent with the review of SAEP records, employee interviews, and site reconnaissance, public organizations were contacted to collect information. Those organizations that contributed information to the PAS are listed below:

- <u>Town of Stratford</u>
  - Planning and Zoning Department
  - Department of Public Works
  - Recreational Department

- <u>County of Fairfield</u>
  - Soils Department

- <u>State of Connecticut</u>
  - Department of Agriculture
  - Department of Environmental Protection
  - American Indian Archeological Institute
  - Historical Commission

- <u>United States</u>
  - Geological Survey
  - Environmental Protection Agency
  - Fish and Wildlife
  - National Oceanic and Atmospheric Administration
  - Army Corps of Engineers

1.3 PROJECT TEAM

WCC completed the on-site survey from March 11 to March 23, 1991. Information collected during the field effort have been organized into a project file and reviewed. The following team of professionals were involved in the project:

- John J. Heinicke, P.E., Geotechnical Engineer and Project Manager, 5 years of professional experience

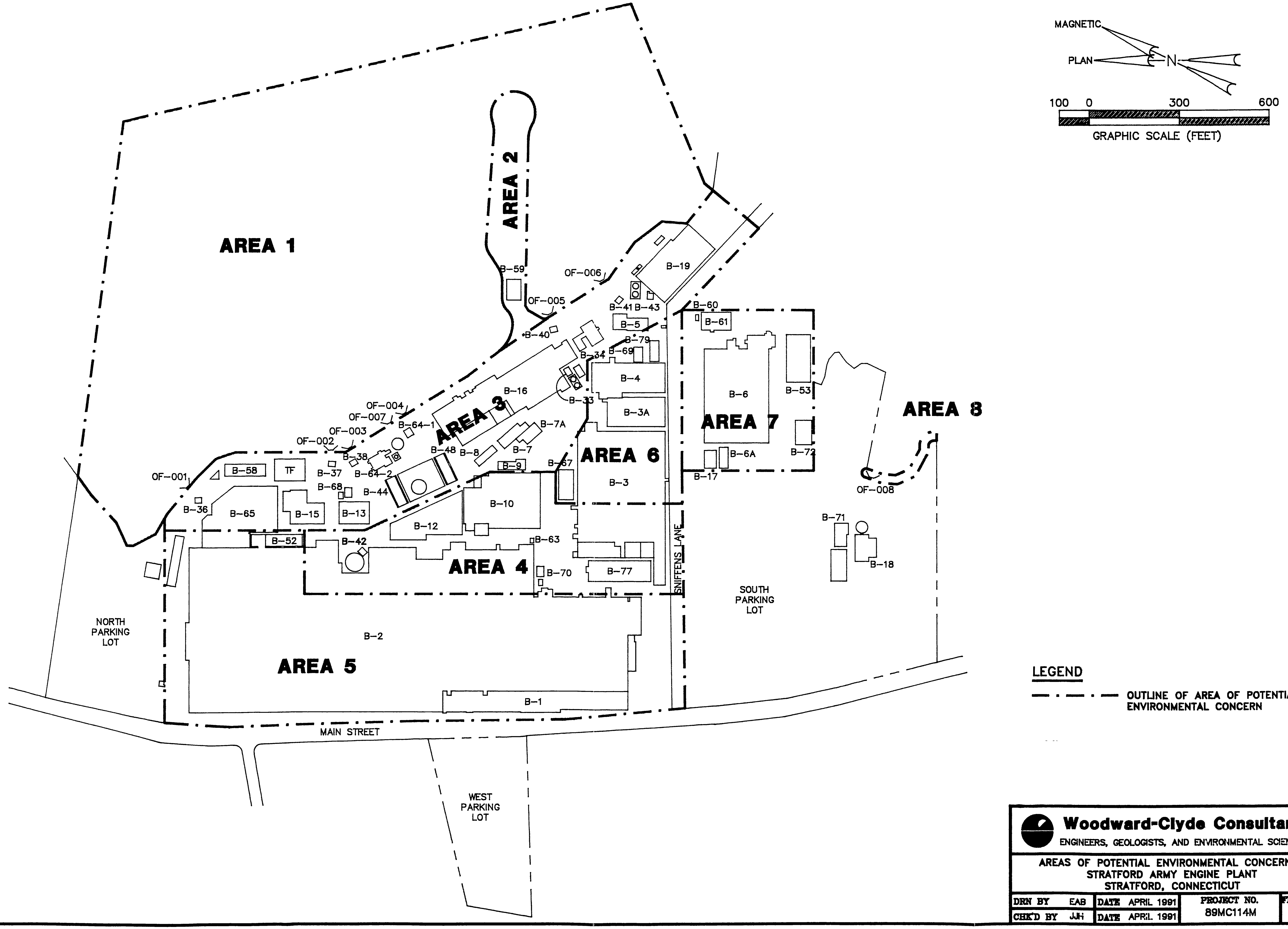
- Quentin P. Bliss, Biologist, 25 years of professional experience

- James L. Kacer, Environmental Engineer, 9 years of professional experience

- Denzil L. Jorgenson, Geologist, 6 years of professional experience

- Jeffrey A. Smith, Environmental Engineer, 3 years of professional experience

- Charles V. Spearman, Environmental and Photogrammetric Technician, 21 years of professional experience.



LEGEND

— · — · — OUTLINE OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN

Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 1
CHK'D BY JJH	DATE APRIL 1991		

2.0
SCOPE DEFINITION

2.1 PROPERTY TRANSACTION TYPE

The SAEP land and buildings are owned by USDA, and plant equipment is owned by both USDA and TLS. The USDA-owned land, buildings, and equipment are provided to TLS in a facilities contract for executing government contracts. TLS also pays rent to the USDA for the use of the plant in manufacturing commercial products (AMC, 1988). USDA is considering the lease or sale of government-owned real property at SAEP to TLS.

Based on property maps and deeds reviewed during this study, USDA-owned property at SAEP covers about 125.5 acres, of which about 48.5 acres are riparian rights along the Housatonic River and 77 acres are land (including the 2.1 acre causeway). The SAEP property has been improved, and consists of 48 buildings, paved roadway and grounds, and 3 paved parking lots (see Figure 2-1).

2.2 PROPERTY CATEGORY

Properties evaluated under AR 200-1 are assigned to one of three categories, as described below:

- Type I property. A property where there is little potential for environmental contamination or disruption from past, present, or proposed activities.

- Type II property. A property where there is some potential for environmental contamination or disruption from past, present, or proposed activities.

- Type III property. A property where there is known potential for environmental contamination or disruption from past, present, or proposed activities.

USDA has determined that SAEP is a Type III property. According to AR 200-1, a Type III property is expected to require follow-up remedial investigation.

2.3 PARTIES TO PROPERTY TRANSACTION

The Army proponent is the lowest level decisionmaker (i.e. Army unit, element, or organization) responsible for initiating or carrying out the proposed property transfer. The transaction proponent is the unit, element, or organization other than the Army responsible for initiating or carrying out the proposed property transaction. For this case, AVSCOM is both the Army proponent and transaction proponent.

The proposed lessor or buyer of the property is TLS.

2.4 PROPOSED PROPERTY USE

Since 1929, the SAEP property has been used to manufacture aircraft components, assemble aircraft, and develop, manufacture, and test engines. Under a lease or sale to TLS, it is believed that the plant would continue to be used to develop, manufacture, and test engines.

2.5 RESTRICTIONS ON FUTURE PROPERTY USE

Potential restrictions on future property use include the following:

- Future construction activities may be subject to Environmental Impact Studies to determine impacts of proposed work on the nearby wetlands or on threatened and endangered species that could potentially be in the site vicinity.

- Future construction activities may be subject to archeological studies to determine whether important cultural artifacts are present at the proposed work site.

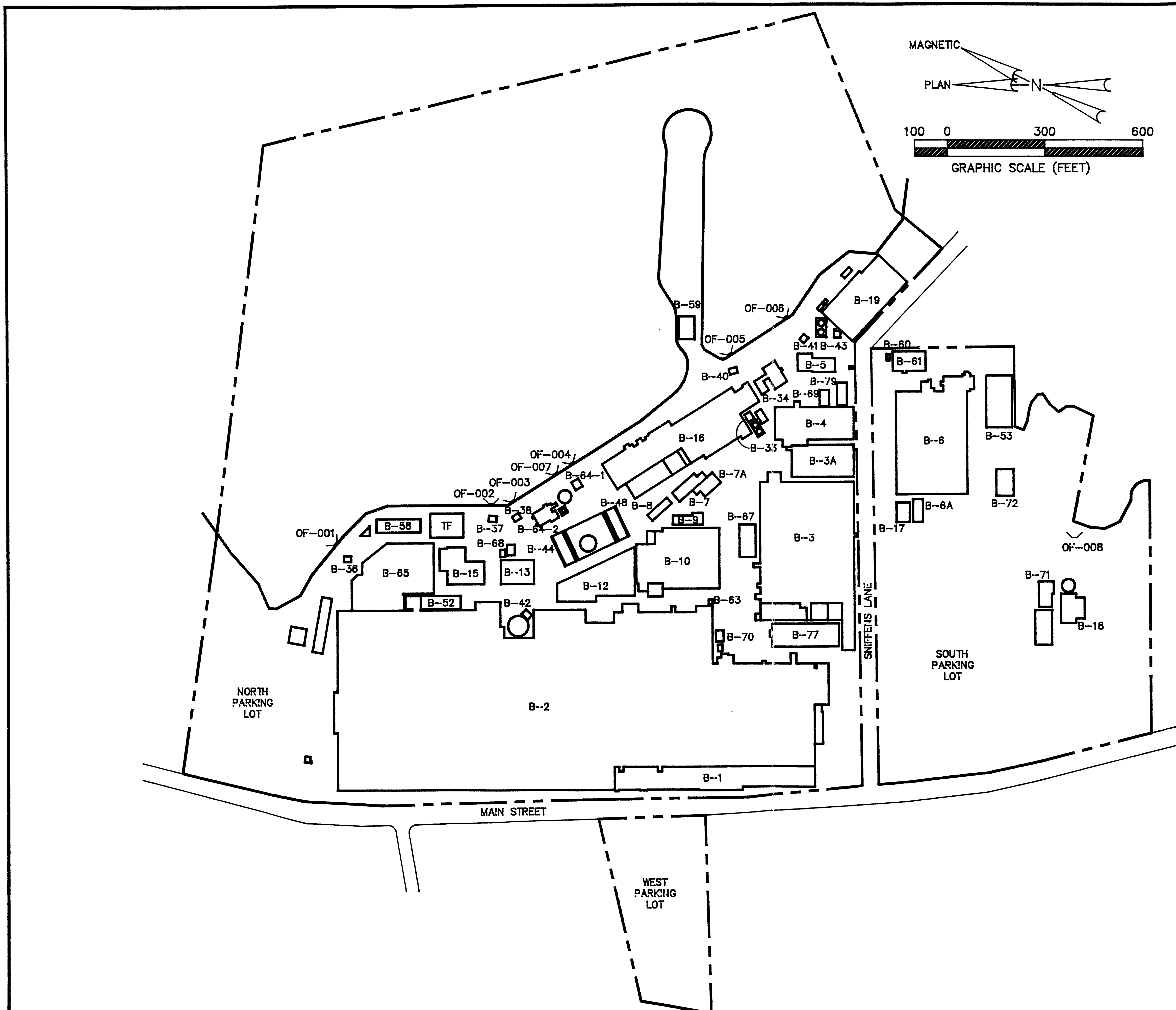
- Future intrusive construction activities may require special health and safety procedures to ensure adequate protection of workers.

- Future encroachment on the riparian rights area of the property will likely not be permitted unless similar wetlands are established elsewhere.

- Future use of the SAEP property for residential or recreational purposes may require remediation.

2.6 REMEDIATION RESPONSIBILITIES

The determination of remediation responsibilities at SAEP was excluded from the scope of this study.



BUILDING NUMBER	BUILDING NAME
B-1	MAIN ADMINISTRATIVE & GOVERNMENT OFFICES
B-2	MANUFACTURING OPERATIONS
B-3	RESEARCH & DEVELOPMENT ENGINEERING
B-3A	ENGINEERING LABORATORIES
B-4	STORES AND AGT-1500 REPAIR
B-5	FUEL SYSTEM TEST
B-6	ENGINE ENVIRONMENTAL & COMPONENT TEST
B-6A	ENGINE MECHANICAL COMPONENT TEST
B-7	ENGINE FUEL SYSTEM TEST
B-7A	ENGINE FUEL SYSTEM TEST
B-8	VOLATILE STORAGE
B-9	AUTOMOTIVE MAINTENANCE
B-10	RECUPERATOR MANUFACTURE
B-12	MAINTENANCE DEPARTMENT
B-13	SCRAP & MATERIAL RECLAMATION
B-15	LUBRICATION STORAGE & FIRE HOUSE
B-16	PRODUCTION & DEVELOPMENTAL TEST CELLS
B-17	ENGINEERING TEST FACILITY
B-18	CHEMICAL WASTE TREATMENT PLANT (CWTP)
B-19	COMPONENT TEST FACILITY
B-33	COOLING TOWER PUMP STATION
B-34	FUEL PUMPING STATION
B-36	STORM DRAIN PUMPING STATION (OF-001)
B-37	STORM DRAIN PUMPING STATION (OF-002)
B-38	STORM DRAIN PUMPING STATION (OF-003)
B-40	STORM DRAIN PUMPING STATION (OF-004)
B-41	STORM DRAIN PUMPING STATION (OF-005)
B-42	SPRINKLER BOOST PUMP STATION (400K GAL.)
B-43	FUEL PUMPING STATION
B-44	STORES & CARPENTER SHOP
B-48	ENGINE CONTAINER REBUILD
B-52	STORES & ADJUNCT TO B-2
B-53	SURPLUS EQUIPMENT STORAGE
B-58	QUALITY & TESTING FACILITY
B-59	ENGINEERING STORAGE
B-60	HI-PRESSURE NATURAL GAS PUMPING STATION
B-61	REFRIGERATION PLANT
B-63	CWTP PUMPING STATION
B-64-1	OIL ABATEMENT PLANT PUMP HOUSE
B-64-2	OIL ABATEMENT TREATMENT PLANT (OATP)
B-65	STORAGE FACILITY
B-67	GENERAL STORES
B-68	EMERGENCY GENERATOR
B-69	USACE RESIDENT ENGINEER
B-70	CYANIDE DESTRUCTION FACILITY (CDF)
B-71	CWTP SOLIDS HANDLING
B-72	FUEL PUMPING STATION
B-77	OFFICE
B-79	SSE BUILDING

LEGEND

— — — PROPERTY LINE

Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

GOVERNMENT-OWNED LAND AND BUILDINGS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	2-1

3.0
ENVIRONMENTAL SETTING

3.1 LOCATION, SIZE, AND BOUNDARIES

SAEP is located in Stratford, Connecticut, on the Stratford Point peninsula in the southeast corner of Fairfield County (see Figure 3-1). The plant lies on the borderline of the Bridgeport and Milford Quadrangles. Latitudinal and longitudinal coordinates of SAEP are approximately 41°-10' North and 73°-07' West.

The Army-owned property at SAEP consists of about 126 acres, of which about 75 acres are improved land and 51 acres are riparian rights. For purposes of this report, directions (i.e. north, south, east, and west) are referenced to the plan north direction, which is skewed about 26 degrees from magnetic north (see Figure 3-1). The plant is bounded as follows:

- North. TLS-owned property, which is paved parking lot and a small wetlands area.

- East. Housatonic River.

- South. Open field; a drainage ditch that flows to the Marine Basin; and several commercial businesses.

- West. TLS-owned property occupied by a hangar; the Sikorsky Memorial Airport; several businesses including a strip mall, gas stations, and restaurants; and Frash Pond.

3.2 AREA LAND USE

Historically, land in the SAEP vicinity has been used for agricultural and residential purposes. At present, local agricultural activities on land are practically nonexistent. The primary agricultural (aquaculture) activity in the area involves growing oysters. Oysters are seeded within areas of the Housatonic River in the spring, and then collected in the fall and placed in Long Island Sound to mature. The seed oyster beds are carefully managed by the State of Connecticut Department of Agriculture because of concerns regarding bioaccumulation of contaminants from the Housatonic River by the oysters.

The SAEP property is zoned light industrial, and land in the vicinity of SAEP is zoned light industrial, business, commercial, or residential (see Figure 3-2). Recreational facilities in the area include Short Beach Park, and nearby public wildlife areas include Nells Island and the Great Meadow Salt Marsh (see Sections 3.9 for discussion of ecological baseline).

3.3 SITES IN THE VICINITY WITH ENVIRONMENTAL RECORDS

A database search of U.S. Environmental Protection Agency (EPA) and State of Connecticut Department of Environmental Protection (DEP) records was completed by Environmental Audit, Inc. (EAI) for the zip code area 06497. This search provided listings of environmental problem sites and identifies sites where hazardous materials are generated or disposed. The EPA and DEP file categories included in the database search and associated number of sites with records are:

- <u>National Priorities List (NPL or "Superfund" list sites)</u>. No NPL sites were identified in this zip code.

- <u>EPA FINDS (Facility Index Database System)</u>. Seventeen facilities were found on nearby property.

- EPA CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) Database. Five facilities were found on nearby properties.

- RCRA (Resource Conservation and Recovery Act) Facilities. Ten facilities were found on nearby properties.

- State Priority List. Four facilities were found near the property.

- Solid Waste Facilities. One solid waste facility is located near the property.

- Open Dumps. No open dumps identified by the EPA were found near the property.

Some of the facilities identified by the database search are listed under more than one file category. The names and addresses of listed facilities within a one-mile radius of SAEP are provided in Table 3-1, as well as comments and observations concerning the listing. The locations of listed facilities are shown in Figure 3-3.

DEP maintains records of spills and releases that are significant enough to require reporting to the DEP. Several such releases have occurred from underground storage tank leaks at Sikorsky Memorial Airport.

3.4 METEOROLOGY

The climate of the SAEP area is strongly influenced by a land-sea breeze, which is most pronounced from spring to early autumn. The sea breeze promotes air mixing that results in slightly higher amounts of precipitation and slightly cooler temperatures at SAEP than inland.

The monthly and annual climatic averages at SAEP are listed in Table 3-2 (NOAA, 1989). The prevailing wind is from the southwest at an average speed of about 11 miles per hour. Precipitation averages about 44 inches per year, with about 16 inches per year of snowfall. Average monthly temperatures range from a low of about 28° Fahrenheit (F) in January to a high of about 73° F in July.

SAEP is located in an area that is subjected to hurricanes, and the area has an intermediate tornado frequency. On average it hails at SAEP about twice per year.

3.5 PHYSIOGRAPHY AND SURFACE HYDROLOGY

3.5.1 Topography

SAEP is located in the Western Highlands of Connecticut which is a part of the New England Physiographic Province. The local area is part of a coastal belt of dissected hilly country that extends along the coast of Connecticut. The coastal belt is characterized by uplands that range from mean sea level (MSL) to 650 feet above MSL and an irregular, rocky coastline. Within the coastal belt, hilltops slope southward at a rate of about 50 feet per mile. Topographic features in the area mostly trend in the north-south or northeast-southwest direction, reflecting the structural trends of the local bedrock (Flint, 1968).

SAEP is situated on the Stratford Point peninsula that extends into Long Island Sound. The peninsula is relatively flat with a slight slope toward the sound. Almost all the land at SAEP is less than 10 feet above MSL. The exception to this is a dike which was constructed along the Housatonic River in 1951 for flood protection. SAEP is within the 100-year floodplain, and wetland areas surround the plant (see Section 3.8.1 for discussion of wetlands).

3.5.2 Surface Hydrology

About 51 acres of SAEP property (riparian rights property) consists of intertidal flats of the Housatonic River, and about 10 acres of land along the Housatonic River consists of man-placed fill over what was once intertidal flats. Based on historical site photographs and plans, the site had a low-lying area at the head of the drainage ditch that is connected to the Marine Basin (in the vicinity of B-3 and B-6). The drainage ditch abuts a portion of the plant's property line (see Figure 3-4).

Surface water bodies in the site vicinity include: Long Island Sound, the Housatonic River, Frash Pond, and the Marine Basin and drainage ditch (see Figure 3-4). The coastal and marine surface waters have been classified by DEP as SC/SB (NUS/FIT, 1990). The SC part of this classification indicates that the DEP recognizes existing water quality problems in the coastal waters; however, the SB classification indicates the DEP's goal of improving the water quality conditions (see Section 5.4.1.2 for discussion of SC/SB classification). Frash Pond is not currently classified in DEPs Water Quality Standard regulations. According to DEP, unclassified surface waters default to an A classification. The A classification designates the following water uses: potential drinking, agricultural, or industrial water supply; fish and wildlife habitat; and recreational.

Long Island Sound receives most of the region's drainage, in large part via the Housatonic River. Water discharges from the Housatonic River range from 40 to over 100,000 cubic feet per second (cfs) and average 3,000 cfs (USGS, 1989). Reported tidal levels for the Housatonic River at Stratford are:

- Low tide level = 0.8 feet MSL
- Mean tide level = 2.9 feet MSL
- High tide level = 5.5 feet MSL

Most of the SAEP surface is paved or covered with buildings. Typical coefficients of runoff for paved surfaces range from 0.8 to 0.9 (this translates to 80 or 90 percent runoff), and runoff from building rooftops is expected to be equal if not higher. Thus, there is little infiltration and heavy runoff during storm events. Most of the precipitation that falls on SAEP is treated and drained to the Housatonic River; however, two exceptions to this are small roof areas of B-2 that drain to either Frash Pond or to the airport.

Runoff at SAEP is collected by one of a network of six storm drainage systems. Each of the storm drain systems is equipped with a pumping station because of the low elevation of the plant and proximity of the Housatonic River and Long Island Sound. Effluent from the storm drainage system is pumped through the oil abatement treatment plant (OATP), except in times of heavy precipitation when some runoff is pumped directly to the Housatonic through individual outfalls (see Section 4.4.1.2 for a discussion of OATP and drainage system).

SAEP is located within the 100-year flood plain (DEP, 1979). The site is partially protected from flooding by a dike that runs the entire length of the property that abuts the Housatonic River; however, the dike is not tied into high ground which would prevent floodwaters from going around the dike. The site was flooded in 1951 when the Housatonic River flooded; another flood occurred in 1968.

3.5.3 Surface Water Supply Capabilities

The Bridgeport Hydraulic Company supplies the cities of Bridgeport and Stratford with potable water from the Trap Falls Reservoir located in Shelton, Connecticut, about 6.5 miles north-northwest of SAEP. In 1989, the Trap Falls Reservoir supplied drinking water to 99.9 percent of the populations of Bridgeport and Stratford, including residents in the immediate area of SAEP. The South Central Connecticut Regional Water Authority supplies the city of Milford with potable water from Lake Gaillard, located in North Branford, Connecticut, about 21 miles east-northeast of SAEP. Both of these water supplies are upgradient of SAEP (NUS/FIT, 1990).

3.6 REGIONAL GEOLOGY

The bedrock geology in the SAEP region consists primarily of subparallel belts of early and middle Paleozoic age metamorphic and igneous rocks of the Southington Mountain and Derby Hill Schists, the Maltby Lakes Volcanics, and the Wepawaug Schist (Crowley, 1968; Flint, 1968; and Fritts, 1965). The major structural feature in the area is the Bridgeport Syncline which is located northwest of the site. A minor structural feature located near the SAEP is a syncline which trends north-northeast through the area. This fold is known as the Wepawaug Syncline and plunges northeast. The trough of the syncline is occupied by the Wepawaug Schist (Fritts, 1965) and southern extent of the syncline's axial plane is located northeast of the site on the north side of the Housatonic River.

The bedrock underlying the site is reported to consist of lower Ordovician age metamorphic schists, phyllites, and paragniesses of the Oronoque Member of the Derby Hill Schist (Fritts, 1965). Flint (1968) identifies these rocks as the Orange Formation. Exposures of bedrock do not occur in the SAEP vicinity. Borings made along the Housatonic River (Flint, 1968) and recent borings completed on site (ESE, 1991) encountered bedrock at depths ranging from about 100 to 150 feet below the land surface. The deep site borings were not available to WCC at the time of this report.

The troughs of synclines were filled with unconsolidated glacial sediments consisting of stratified drift and till in Quaternary time. Recent deposition of alluvium, estuarine, tidal marsh, beach sediments, and man placed artificial fill occur along the Housatonic River. The surficial unconsolidated sediments reported at SAEP are Stratford Outwash, tidal marsh peat, and artificial fill (Flint, 1968; and U.S. Department of Agriculture, 1981). Lordship Outwash sediments are found south of the SAEP (Flint, 1968).

Stratified drift is the main water-bearing hydrogeologic unit in the site area and consists of sorted sediments deposited in streams formed by the meltwater of glaciers. The stratified drift forms two depositional facies, known as ice-contact stratified drift and outwash (Flint, 1968). Ice-contact stratified drift is defined as "sediments deposited in streams and other bodies of water against, upon, beneath, or otherwise in immediate contact with melting glacier ice" and is characteristically poorly sorted, and contains irregular beds with large and abrupt changes in grain sizes ranging from clay to boulders. Conversely, outwash is defined as "sediments deposited by streams beyond the glacier, and free of any influence of buried ice" and is generally well sorted sand to fine gravel with lenticular beds.

Borings completed near the mouth of the Housatonic River encountered post-glacial estuarine mud unconformably overlying stratified drift at depths as great as 60 feet below MSL (Flint, 1968). The estuarine sediment is described as a gray mud consisting of silt and clay with organic matter. It has a maximum reported thickness of about 60 feet.

The tidal marsh and swamp deposits in the area consist of decayed plant matter, peat, and mixtures of silt and clay with high amounts of peat. These deposits may be as thick as 15 feet. The SAEP area is influenced by tidal marsh sediments deposited at and upstream from the mouths of tidal inlets (due to rise in sea level since the last glaciation and daily tides) that discharge to the ocean (Flint, 1968). Tidal marsh sediments consist of peat and very organic silt or clay that form wedge shaped deposits which become thicker towards the ocean or mouth of the streams.

Stratford Outwash is found along the fringes of the Housatonic River and consists of well sorted sand with small amounts of gravel. Borings completed for the Washington Bridge (Highway 1, about 2 miles north of SAEP) encountered outwash sand underlying more recent alluvium, tidal marsh and swamp peat, and estuarine sediments to an elevation of about 115 feet below MSL (Flint, 1968). This indicates that the outwash had filled the entire valley of the Housatonic, but after extensive erosion by the river and rise in sea level, only remnants of the deposit remain. In some exposures along the Housatonic River north of the site, the Stratford Outwash is found overlying ice-contact stratified drift (Flint, 1968).

3.7 SITE GEOLOGY AND HYDROGEOLOGY

A preliminary assessment of the geology and hydrogeology at the SAEP was made by evaluating existing data from boring logs and monitoring wells from the following sources:

- Test Boring Data (borings 1-53 through 54-53) at locations across most of the site from an Avco Manufacturing Corporation plant engineering drawing dated June 3, 1953

- Subsurface Explorations (DH1-80 through DH14-80) at B-44 and B-48 from a Corps of Engineers drawing dated January 30, 1980

- Drilling logs of groundwater monitoring wells (MW1-81 through MW5-81) drilled at the lagoon area by East Coast Drilling & Boring, Inc. between November 10 to November 12, 1981

- Drilling logs of groundwater monitoring wells (MW6-83 and MW7-83) drilled at the lagoon area and logged by Leggette, Brashears & Graham, Inc. on July 20, 1983

- Drilling logs of soil borings (D1-86 through D11-86) drilled at the plating area of B-2 by East Coast Drilling & Boring, Inc. between May 4 to May 11, 1986

- Boring logs contained in geotechnical and environmental engineering reports by Haley & Aldrich (1987, B-65), Metcalf & Eddy (1990, B-5), and Metcalf & Eddy (1987, lagoon area)

- Groundwater data environmental engineering reports by Metcalf & Eddy (1987 and 1990) and ESE (1991).

Generalized geologic cross-sections A-A' and B-B' (see Figures 3-5 and 3-6, respectively) were developed from this information. None of the above-referenced borings on site were drilled to the bedrock surface. The identification number shown on the cross-sections represent the boring number and year the boring was drilled and corresponds to the references listed above.

The borings and cross-sections show that the shallow geology is characterized by five distinct units: sand, gravel and debris fill material; highly organic silt and peat (tidal inlet or marsh deposits); silt and sandy silt alluvium associated with the peat; estuarine silt; and stratified drift consisting of outwash sand with some gravel and ice-contact sand, gravel, cobble deposits. A description of these units and their distribution across the SAEP follows:

Fill

SAEP is mantled with sand, gravel, and debris fill associated with buildings, roads, utilities, site grading, and other structures. The fill is generally about 5 feet thick, but locally extends about 14 feet (Boring 16-53) to 19 feet (Boring 14-81) below the land surface (about 8 to 13 feet below MSL) near the former lagoon area (see Figure 3-5). A tidal inlet was presumably filled in the area of B-6, B-72, and B-3 because deposits of peat and silt were encountered below the fill in borings from this area. At B-3 (Boring C13-53), the fill is about 8 feet thick and a thin wedge of peat and silt was found below the fill.

The fill as described in most of the borings is a granular material, which has presumably been placed to improve drainage for the structures in this near coastal environment. Since most of the SAEP is covered with pavement or buildings, infiltration from precipitation is expected to be low and overland runoff high. Water that infiltrates is expected to drain rapidly, but may accumulate as perched water where the fill is underlain by peat and silt deposits because of decreased specific yield in the peat and silt relative to other areas underlain by the stratified drift. Water levels recorded at the time of drilling some borings, and the water levels reported in existing monitoring wells, show the base of the fill is saturated. The depth to water at SAEP ranges from about 4 to 11 feet below the land surface depending on the surface elevation and tidal influence.

Peat and Silt Alluvium

A highly organic silt and peat has been found below the fill in two general areas on site (see Figure 3-5 and 3-6). The largest peat deposit is at the south part of SAEP and includes the former lagoon area, B-72 and B-6, and the west part of B-3. A smaller area of peat and organic silt was also found near B-65.

The peat and silt at the south part of SAEP forms a wedge-shaped deposit that likely accumulated in a tidal inlet channel and was later artificially filled. The peat deposit is about 4 feet thick near the northwest part of B-3 (Boring C13-53) and becomes progressively thicker to the south (seaward), reaching a maximum thickness within SAEP property ranging from 9 to 15 feet south of B-72. A 1929 site grading plan shows a planned cut and fill in this area of the site. Up to 5 feet of fill was placed at that time in the low-lying area at the head of the drainage ditch that runs to Marine Basin. Beneath the south part of the site, the peat deposit appears to be about 250 feet wide and about 1100 feet long, and it extends from the north end of the drainage ditch to the northwest corner of B-3. This drainage ditch can be seen in the historical aerial photographs of the SAEP. Photographs taken during this study show the existing, unfilled portion of this drainage (see Appendix B, Photographs 8-1 through 8-4). Historically, this drainage appears to have meandered northward to at least the northwest corner of B-3.

Previous groundwater studies indicate a groundwater mound located near the former lagoons and the existing drainage ditch. The groundwater mounding coincides with the estimated area of the peat and silt deposits found in this area. The groundwater mound may be caused by a lower specific yield (vertical drainage due to gravity) in the peat and silt relative to the adjacent stratified drift deposits. High tides may also be a factor contributing to the groundwater mound. High tide water entering the drainage ditch from Marine Basin may enter the buried portions of the inlet through the overlying granular fill. Another possible cause of the groundwater mound could be a slow leaking water line in the area.

The peat layer is located in a former natural tidal inlet that drained from the SAEP and is now filled with granular material. The granular fill overlying the peat layer at the south end of the SAEP may form a localized, preferential groundwater migration pathway. Water and/or contaminants that enter the environment near the peat deposit may preferably flow along this deposit and be dispersed to the south. Volatile organic compounds (VOCs) detected in monitoring wells located south of Sniffen Lane are concentrated at wells located within the area where the peat and organic silt is found (ESE, 1991). This provides some evidence that this layer may be a controlling factor in the movement of contaminants beneath this part of the facility.

Stratified Drift

Glacial sand and gravel deposits underlie the fill and peat deposits. The deposits are divided into units of sand with trace amounts of coarser material of sand and gravel with clay, silt, cobbles and occasional boulders (see Figure 3-5 and 3-6). The sand and the sand/gravel units may be the Stratford Outwash and ice-contact stratified drift, respectively (Flint, 1968). These units are continuous across the site, but are eroded along the Housatonic River. Borings completed near or in the river encountered up to about 40 feet of silt (river sediment) overlying the sand and gravel deposits.

The sand and sand/gravel deposits form the upper aquifer at the SAEP which may be up to 150 feet thick. This aquifer apparently contains fresh water based on conductivity results reported by ESE (1991), but no information was found to indicate whether a salt water wedge typical of coastal environments is present. Water wells for drinking supply or other domestic uses are not present in the vicinity of the SAEP (see Section 3.5.3 for discussion of water supply).

Estuarine Silt

An estuarine deposit consisting of silt, fine sandy silt, and silty sand with some organic material and sea shells has been identified along the Housatonic River (see Figures 3-5 and 3-6). The stratified drift in this area was eroded by the rising sea level and Housatonic River, and estuarine silt was deposited. The estuarine silt creates a facies change which will significantly reduce the rate of groundwater flow from the glacial sand and gravel to the estuarine deposits within the Housatonic River. Local groundwater flow near B-5 was determined to be towards the Housatonic River (Metcalf & Eddy, 1990). Estuarine and peat deposits are found east of the Frash Pond near B-65. This could indicate a former natural outlet of the pond.

The occurrence and movement of groundwater at the SAEP has not been fully identified. Existing site monitoring wells are shown in Figure 3-11. ESE is currently involved in a study to determine the tidal influence on the aquifer system near the lagoon area. Additional monitoring or observation wells are needed across the SAEP to better understand the hydrogeologic system. Frash Pond is located near the northwest boundary of the SAEP and may be a source of local recharge. There may be a groundwater divide and buried tidal inlets on the SAEP, and other buried outlets from Frash Pond may pass under SAEP (Envirosphere Company, 1984). These types of features appear to be a factor controlling groundwater movement patterns and fate of potential contaminants.

3.8 REGIONAL AIR QUALITY

SAEP is located in the New Jersey-New York-Connecticut Interstate Air Quality Control Region (IAQCR). Connecticut is also a part of an Ozone Transport Region that includes many northeastern states. This region is highly developed and contains some of the most densely populated and industrialized cities of the United States.

The Stratford area is currently in a severe nonattainment area for ozone and a moderate attainment area for carbon monoxide. This area is in an attainment area for suspended particulates (see Section 5.5 for discussion of Clean Air Act). Total suspended particulates in the Stratford area are generally higher when the wind is from the southwest (ESE, 1981).

3.9 ECOLOGICAL BASELINE

3.9.1 Wetland Resources

The Stratford area is located in a coastal region that is characterized by extensive tidal marshes, beaches, and estuaries. Wetlands in this area generally include tidal marshes, intertidal flats, and freshwater marshes.

Tidal marshes are influenced by seawater tides, and they generally have high nutrient levels and high biological productivity. They are usually important feeding grounds for shorebirds and waterfowl, and they can be important shellfish spawning and rearing areas. Vegetation in tidal marshes consists primarily of sedges, rushes, and grasses that typically provide nesting habitat for birds.

Intertidal flats are generally level to gently sloping areas that are subjected to alternating periods of tidal inundation and exposure. Sediments in intertidal flats may range from clays and silts to sand. Although they have little or no vegetation, intertidal flats are typically nutrient enriched and support populations of macroinvertabrates which are important food sources for fish and shorebirds.

Freshwater wetlands occur frequently along the coastline of Connecticut. Soil saturation is the dominant factor concerning the types of plants and wildlife that can survive in the wetland. Many wetland areas are void of trees and shrubs, with soft-stemmed plant vegetation such as cattails, spatterdock, and pickeralweed. These types of wetlands act as filters to trap nutrients, sediments, and in some cases toxic materials. Wetlands with high nutrient levels are high biological productivity areas and are important feeding and nesting grounds for birds.

All three types of wetland areas discussed above occur in the vicinity of SAEP (see Figure 3-7). Of the three, freshwater wetlands have the smallest areal extent. Freshwater wetlands in the vicinity are primarily associated with two freshwater bodies: Frash Pond and Sally Pond. A small acreage of land that abuts the SAEP property to the north has also been designated at wetlands. Intertidal flats in the vicinity of SAEP are located in a band along the shoreline of the Housatonic River and Long Island Sound. SAEP's riparian rights encompass an intertidal flats area. Large areas of tidal marshes occur in the site vicinity, including areas along the Housatonic River, Nells Island, land around Sikorsky airport, and the Great Meadow Salt Marsh (see Figure 3-7).

The Great Meadow Salt Marsh was originally 1,450 acres, reportedly one of the largest tidal wetland ecosystem in the Long Island Sound area (Stratford Coastal Plan, 1989). Since the 1920s, the Great Meadow Salt Marsh has been modified by mans' activities, including construction of Sikorsky Memorial Airport, disposal of dredge material, landfill operations, construction of Lordship Boulevard, and fill placement to create industrial, commercial, and residential areas. Presently, only 406 acres (about 28 percent) of this tidal wetland complex remains.

Nells Island and the Great Meadow Salt Marsh have a recognized value to wildlife, and both have been set aside as wildlife refuges. Such designation should allow local natural ecosystems to be maintained in the future.

3.9.2 Biological Resources

3.9.2.1 Vegetation

Plant life in the vicinity of SAEP is limited to the tidal marshes. The highly urbanized areas of Stratford, Bridgeport, and Milford have little vegetation resources.

The tidal marsh plant life consists primarily soft stemmed plants. Sedges, rushes, and grasses comprise the majority of plant life. Cordgrass (Spartina patens) and weed (Phragmites communis) are the dominant species in the marshes. A number of southeastern Piedmont and Coastal Plain plant species reach their northern native range limits in this region.

3.9.2.2 Wildlife

Because of the highly urbanized nature of the Stratford, Connecticut region, wildlife is primarily concentrated into the tidal marshes and intertidal flats of the area. These areas are important feeding habitats for shore birds and waterfowl. The SAEP property contains about 51 acres of riparian rights, most of which is intertidal flats. The Great Meadows Salt Marsh and Nells Island (tidal marshes) are located in the vicinity of SAEP (see Figure 3-7).

Tidal marshes provide habitat for mammals such as rodents and insectivores. The primary mammal species include muskrats (Ondatra zibethica), cottontail (Sylvilagus sp.), and raccoons (Procyon lotor). Cordgrass provides an ideal forage and building material for muskrats. Raccoons feed on crustaceans and small rodents. Few, if any, reptiles or amphibians are known to exist in the SAEP vicinity. Because of a lack of preferred habitat on SAEP property, none of these wildlife species would be expected on site.

There have been 220 species of birds observed in the site area. Of these, 185 species are considered to be regular users of the region's habitats, and the other 35 species are considered to be occasional visitors. Shore birds and waterfowl constitute the majority of bird life in the SAEP vicinity. The wetlands near SAEP are known breeding grounds for transitory birds such as the great egret (Casmerodius albus), snowy egret (Nyctanassa vidacea), black-crowned night heron (Nycticorax nycticorax) glossy ibis (Plegadis falcinellus), and fish crow (Corvus ossifragus).

Two bird species that nest in the site area are the least tern (Sterna antillarum) and piping plover (Charadrius melodus). The number of least tern breeding pairs in the area has increased from 30 pairs in 1973 to 170 pairs in 1986. During the past 8 years, 8 to 19 pairs of piping plover are known to have nested at Long Beach, Short Beach, and Milford Point. Both species would use tidal marshes as feeding areas during the breeding season. The occurrence of shorebirds and waterfowl on SAEP property is expected to be limited to the intertidal flats area of the Housatonic River.

3.9.2.3 Aquatic Life

Aquatic life in the vicinity of SAEP exist in one of three ecosystems: the Housatonic River and its estuaries provide a freshwater and saltwater environment; Long Island Sound provides a marine environment; Frash Pond provides a freshwater environment. The brackish waters associated with the Housatonic River have varying degrees of salinity that provide different biota characteristics than Long Island Sound.

The Housatonic River supports limited sportfishing for finned fish, and sportfishing for shellfish is done on a restricted basis because of water quality concerns. Sportfishing for winter flounder, blackfish, bluefish, scup, and lobster is common in Long Island Sound. Frash Pond is also reportedly used for sportfishing.

Shellfishing has been an important commercial industry in the area for a long time. In 1895, over one million bushel of oysters were harvested from Stratford's natural oyster beds. By 1960, production of oysters had dropped considerably. Fishing for seed oysters along the shallow waters of the Housatonic River, from its mouth to several miles upstream, has become an important part of the area's shellfishing industry. Seed oysters are sold to commercial oyster companies which plant the seeds in designated areas of

Long Island Sound. Although the eastern oyster is the primary species of shellfish harvested from the area, other shellfish that are fished for include the hard clam (quahog), bay scallop, soft-shelled clam (steamer), blue mussel, and razor clam.

3.9.3 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries, and the DEP were contacted to obtain information on federal- and/or state-listed threatened or endangered species that have been reported to occur near the SAEP. Information was also obtained from other reports that have been prepared for the general area including the Stratford Coastal Plan. Federal- and state-listed threatened, endangered, or special concern species that have the potential to occur in the vicinity of SAEP and the status of each is provided in Table 3-3.

As shown on Figure 3-8, several areas have the potential to be utilized by threatened, endangered, or special concern species are located in the vicinity of SAEP. These areas include salt marshs, saltwater intertidal flats and shores, and coastal sand dunes. The presence of these areas has contributed to the number of threatened, endangered, and special concern plant and bird species in the vicinity of SAEP.

As shown on Table 3-3, no federally-listed threatened and endangered plant species have been reported to occur in the vicinity of SAEP. However, a total of 13 plant species have been proposed to be listed by the State of Connecticut. Several of these species (saltpond grass - 1901, seabeach sandwort - 1907, mudwort - 1897, yellow-fringed orchid-1909, salt marsh bulrush - 1943, and coast violet - 1905) have not been reported recently in the vicinity of SAEP and may be extripated from the area. Since no native vegetation presently occurs on SAEP, no state-listed species would occur within the plant boundaries.

Two federally-listed and 11 additional stated-listed threatened, endangered, or special concern birds have the potential to occur in the vicinity of SAEP. The two federally-listed species include the piping plover and Roseate tern. The last report of the Roseate tern in the vicinity of SAEP was in 1969.

The piping plover frequently occurs in the vicinity of SAEP, and nesting habitat is located on Short Beach, Long Beach, and Milford Point. These areas are extremely important to the continued survival of the piping plover and select areas of these beaches are closed to public activity during the nesting and rearing period. During the last 8 years, between 8 and 19 pairs have nested annually on these three areas (DEP, 1990). The highest nesting activity occurred in 1989 and 1990 when 17 and 19 pairs nested, respectively. The previous high had been 12 pairs. During this period 11 to 29 young birds (fledges) were produced annually, with 1989 and 1990 also being the highest years (DEP, 1990). The beach area utilized as nesting habitat by the piping plover is probably also used by the least tern which is a state-listed threatened species.

Although not identified by USFWS or DEP, both the federally listed southern bald eagle (Haliaeetus I. lencocephalus) and the peregrine falcon (Falco peregrinus) have been reported to possibly pass through the SAEP area as migrating transients.

Since SAEP does not contain habitat utilized by most threatened, endangered, or special concern bird species, they would not be expected to occur on the site. However, the intertidal flats along the Housatonic River provide feeding areas for waterfowl and shore birds. Therefore, it would be expected that piping plover and least tern that nest in the general area would use this feeding area.

The northern diamondback terrapin, a federal candidate species - Category 2, was identified as having the potential to occur in the vicinity of SAEP. Collection records indicate that the diamondback terrapin has been collected from the mouth of the Housatonic River (USFWS, 1991). Presently, information is not available to determine whether they use the beaches or adjacent uplands for nesting. Since this type of habitat does not exist within SAEP property, they would not be expected to be present on site. While federal candidate species are not protected under the Endangered Species Act, USFWS encourages their consideration in environmental planning. If unnecessary impacts to candidate species can be avoided, the likelihood that they will be placed on the federal list is reduced.

No federal- or state-listed mammal, amphibian, invertebrate, or aquatic threatened or endangered species are expected to occur in the vicinity of the SAEP.

3.9.4 Cultural Resources

An archeological overview and management plan has been prepared for SAEP (Envirosphere Company, 1984). Much of the information presented in this section was obtained from that report.

The National Historic Preservation Act of 1966 as amended (94 Stat. 2988) affirmed the policy of the federal government (Sec. 2[3]) to "administer federally owned, administered or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations". The United States Army Materiel Command (AMC) is committed to the implementation of that policy, following the guidelines for historic resource management set forth in the 1966 Act and related laws, regulations, and technical guidance.

The cultural history of the SAEP vicinity is presented in Table 3-4. Evidence for prehistoric occupation of the area has been identified around the various water bodies in the area. At the bank of the Housatonic River, near its mouth, a collection of artifacts and features is suggestive of a Late Archaic encampment. This site consisted of steatite bowls and fragments, projectile points, fire-cracked rock, charred ash, charred hickory nuts, and heat-treated debris from stone tool manufacture. Late Archaic skeletal remains, associated with stone tools, pestle, axe, and projectile points have been uncovered near Frash Pond (Envirosphere Company, 1984). Known archeological sites in the vicinity of SAEP are shown on Figure 3-9.

Late Archaic sites tend to be temporary campsites, frequently situated on small knolls. Most likely, knolls were chosen for their dry ground surfaces and visibility of the landscape. The Late Archaic period in southern New England was characterized by alternating seasons of aggregation and dispersal. The Late Archaic sites reported from the Stratford region indicate small numbers of people staying at a site for a short period of time.

Sites of the Late Woodland period in the SAEP vicinity are frequently village sites, containing such features as post molds and hearths, an abundance of pottery, and ground stone and chipped stone tools. The high density of Woodland period sites along the coast may indicate a shift from the inland to the coast at this time. Further, Late Woodland village sites may be suggestive of the exploitation of the coast's fertile land for the practice of horticulture. Several cemeteries also occur from the Woodland period in the general region of the Plant.

The lack of sites from Paleo-Indian through Middle Archaic times may be the result of: (1) the submersion of these sites by rising postglacial sea levels; (2) the destruction of these sites by wave action erosion; and (3) bias in data recovery due to the low archeological visibility of small, early period sites.

The first European settlement in the vicinity of the SAEP was at Sandy Hollow, a short distance from the Housatonic River. In the mid 1600s, SAEP was part of an English plantation that included four major "common fields": the "Ould Field" lay immediately south of Stratford Village; the "New Field" lay from Clapboard Hill to Mill Creek, including Nesumtaw's Creek; the "New Pasture" was situated just south of Old Mill Green, now in Bridgeport, from Mill Creek, to the river; and the "Great Neck Field" was located south of the "Ould Field". The economy at this time was based on the cultivation of wheat, rye, corn, oats, grass, and flax and the production of cider brandy, butter, cheese, port, lard, and flaxseed. Fishing and cattle raising were also practiced through the 1800s. Mills along the Housatonic and other rivers gave way to a fully industrial-based economy in the mid-late nineteenth century (Envirosphere Company, 1984).

All buildings at SAEP have been constructed on either concrete slabs and/or piles, presumably because of drainage problems at the site. For that reason, it is likely that ground disturbance in developed portions of the SAEP (other than those identified as cut and fill areas) is relatively shallow. However, even shallow disturbance when considered along with the poor drainage characteristics of the site, is sufficient reason to believe that these areas are not likely to contain important archeological resources.

The Connecticut State Historic Preservation Officer reported that two prehistoric archeological sites are located within SAEP property (Figure 3-9). Envirosphere Company (1984) reported that the extensive modification of shoreline areas combined with the site's extremely poor drainage characteristics made it highly unlikely that intact, previously unrecorded resources existed on the onshore portion of the SAEP.

During the present record search, a newspaper article written sometime during the 1930s was found that reported an archaeological site was discovered when expanding a parking lot at SAEP. This site was reported to be an Indian burial ground. The extent that this site was studied or the credibility of this report is not known, nor is it known whether any resources remain. If this area is planned to be disturbed at some future date, a more detailed archaeological survey may be required.

3.9.5 Recreational Resources

The recreational potential for the Stratford area is enhanced by its location near the Housatonic River and Long Island Sound because access to these waters provides for water-based recreational uses. Such water-based recreational activities include swimming, windsurfing, recreational boating (canoeing, sailing, and yachting), and recreational fishing. Recreational fishing is mostly for fish at this time, as recreational shellfishing is strictly regulated because of water quality conditions including elevated coliform bacteria levels.

The shoreline area is important for passive recreational use including picnicking, sightseeing, and sunbathing. Some developed areas in the coastal shoreline area also provide facilities for golf, beach volleyball, softball, and tennis. Through public or private involvement, recreational facilities that have been developed in the Stratford area include one private and two public beaches, four marinas (a fifth has been approved), several public fishing areas, one public boat launching ramp, and two informal boat launching areas (DEP, 1989).

Recreational land and water use in the immediate site vicinity (2 mile radius) includes all the activities discussed above for the Stratford area. Although the shallow waters of the Housatonic River are used as an initial rearing area for oysters, it provides little recreational shellfishing because of water quality concerns. The Housatonic River and Long Island Sound are utilized for recreational boating and fishing, and Frash Pond is a popular fishing spot (DEP, 1989). There are three marinas located in the SAEP vicinity (see Figure 3-10).

Short Beach Park, a public recreational area, is located about 1 mile south of the site. Park facilities include beach frontage with beach volleyball courts, children's playground, picnic areas, tennis courts, basketball courts, softball fields, bike paths, jogging trails, and a golf course. The golf course was constructed on a municipal landfill. A sticker is required to use the park; the sticker is free to Stratford residents and workers at nearby businesses (including SAEP workers), and it costs $50 per year or $10 per day for others. In 1990, the park received about 40,000 visitors, plus about 43,000 golfers (Stratford Department of Recreation, 1991).

Another recreational area is planned for an area about 3.5 miles northeast of SAEP. The State has obtained about 310 acres of land, and intends to utilize it for the Silver Sands State Park. This park will contain beach frontage, and it is expected to accommodate an estimated 8,000 visitors per day (DEP, 1991).

TABLE 3-1
ADJACENT SITES WITH ENVIRONMENTAL RECORDS

Name and Address	Agency with Record	Comments/Observations	Site Number(1)
AVCO Lycoming Textron FLGT SVC Hangar 1, Sikorsky Airport Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	FINDS list only. No additional information.	1
Beacon Point Landfill Beacon Point Road Stratford, CT	EPA Responsible Office: Superfund - Hazardous Waste - Superfund. DEP: Hazardous Materials Management Unit, Hazardous Waste Section.	Asbestos on-site burial. Groundwater not sutiable for drinking water without treatment. In CERCLIS, Preliminary Assessment completed 8/7/85.	2
Bellrock Color Inc. 60 Old South Ave. Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	3
Breezy Point Auto Body Inc. 75 Access Road Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	4
Breezy Point Garage Inc. 609 Main St. Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	FINDS list only. No additional information.	5

TABLE 3-1

ADJACENT SITES WITH ENVIRONMENTAL RECORDS (Continued)

Name and Address	Agency with Record	Comments/Observations	Site Number(1)
CEMO AVCO Lycoming Textron 125 Access Rd. Stratford, CT	EPA Responsible Offices: Hazardous Waste Data Management System, Office of Solid Waste (RCRA); Permit Compliance System, Office of Water Enforcement and Permits; Compliance Data System, Office of Air and Radiation	FINDS list only. No additional information.	6
Charter Arms Corp. 430 Sniffens Ln. Stratford, CT	EPA Responsible Offices: Hazardous Waste Data Management System, Office of Solid Waste (RCRA); Permit Compliance System, Office of Water Enforcement and Permits	Generates at least 1000 kg/mo non-acutely hazardous waste or 1 kg/mo acutely hazardous waste. No permit status information.	7
Housatonic Boat Club Shore Rd. Stratford, CT	EPA Responsible Office: Superfund - Hazardous Waste - Superfund. DEP: Hazardous Materials Management Unit, Hazardous Waste Section.	Asbestos/sludge on-site burial. Groundwater not sutiable for drinking water without treatment. In CERCLIS, Preliminary Assessment completed 4/1/83.	8
MAACO of Greater Bridgeport 770 Woodend Rd. Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	9
Micro Etch Products Div. of Astro 94 Dodge Avenue Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Generated at least 1000 kg/mo non-acutely hazardous waste or 1 kg/mo acutely hazardous waste. Closure certified.	10

TABLE 3-1

ADJACENT SITES WITH ENVIRONMENTAL RECORDS (Continued)

Name and Address	Agency with Record	Comments/Observations	Site Number(1)
Response Graphics Div Moore Co. Sniffens Ln. Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	11
Rudkin Wiley Corp 360 Sniffens Ln. Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	No permit status information.	12
Short Beach Park Area Dorne Dr. Stratford, CT	EPA Responsible Office: Superfund - Hazardous Waste - Superfund. DEP: Hazardous Materials Management Unit, Hazardous Waste Section.	Asbestos/sludge on-site burial. Groundwater not sutiable for drinking water without treatment. In CERCLIS, Preliminary Assessment completed 4/1/83.	13
Sikorksy Memorial Airport Main Street Stratford, CT	EPA Responsible Office: Superfund - Hazardous Waste - Superfund. DEP: Hazardous Materials Management Unit, Hazardous Waste Section.	Asbestos on-site burial. Groundwater not sutiable for drinking water without treatment. In CERCLIS, Preliminary Assessment completed 5/24/85.	14
Stratford Landfill Area Short Beach Rd Stratford, CT	EPA Responsible Office: Superfund - Hazardous Waste - Superfund. DEP: Hazardous Materials Management Unit, Hazardous Waste Section.	Asbestos on-site burial. Groundwater not sutiable for drinking water without treatment. Closed about 1973. In CERCLIS, Preliminary Assessment completed 5/24/85.	15
Stratford SS Incinerator Birdseye St Stratford, CT	EPA Responsible Office: Compliance Data System, Office of Air and Radiation	FINDS list only. No additional information.	16

TABLE 3-1

ADJACENT SITES WITH ENVIRONMENTAL RECORDS (Continued)

Name and Address	Agency with Record	Comments/Observations	Site Number(1)
Stratford STP Birdseye St. Ext. Stratford, CT	EPA Responsible Office: Permit Compliance System, Office of Water Enforcement and Permits	FINDS list only. No additional information.	17
Stratford Water Pollution Control 105 Beacon Point Rd Stratford, CT	EPA Responsible Office: Hazardous Waste Data Management System, Office of Solid Waste (RCRA)	Same location as Stratford STP, listed above. Non-handler of hazardous waste. No RCRA permit status information.	18
Textron Lycoming CSC 125 Access Rd. Stratford, CT	EPA Responsible Office: None listed	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	19
Textron Lycoming Flight Service Hanger No.1 Sikorsky Airport Stratford, CT	EPA Responsible Office: None listed	Generates at least 100 kg/mo but less than 1000 kg/mo non-acutely hazardous waste. No permit status information.	20

(1) See Figure 3-3 for site location.

TABLE 3-2
METEOROLOGICAL DATA FOR SAEP VICINITY
(Source: NOAA, 1989)

NORMALS, MEANS, AND EXTREMES

BRIDGEPORT, CONNECTICUT

LATITUDE: 41°10'N LONGITUDE: 73°08'W ELEVATION: FT. GRND 7 BARO 28 TIME ZONE: EASTERN WBAN: 94702

	(a)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F:														
Normals														
-Daily Maximum		36.5	37.9	45.5	57.2	67.1	76.4	82.1	81.1	74.5	64.5	52.8	41.0	59.7
-Daily Minimum		22.5	23.3	30.9	40.0	49.8	59.3	65.9	65.0	57.8	47.4	38.1	27.3	43.9
-Monthly		29.5	30.6	38.2	48.6	58.5	67.9	74.0	73.1	66.2	56.0	45.5	34.2	51.9
Extremes														
-Record Highest	41	65	67	74	86	92	96	103	98	99	85	78	65	103
-Year		1974	1976	1989	1977	1987	1974	1957	1953	1953	1959	1975	1971	JUL 1957
-Record Lowest	41	-7	-5	4	18	31	41	49	44	36	26	16	-4	-7
-Year		1984	1963	1967	1982	1966	1967	1988	1982	1963	1988	1972	1980	JAN 1984
NORMAL DEGREE DAYS:														
Heating (base 65°F)		1101	963	831	492	220	20	0	0	49	285	585	955	5501
Cooling (base 65°F)		0	0	0	0	18	107	279	251	85	6	0	0	746
% OF POSSIBLE SUNSHINE														
MEAN SKY COVER (tenths)														
Sunrise - Sunset	40	6.2	6.1	6.3	6.4	6.5	6.1	6.0	5.8	5.7	5.4	6.3	6.3	6.1
MEAN NUMBER OF DAYS:														
Sunrise to Sunset														
-Clear	40	8.5	8.2	8.0	7.3	6.7	7.7	7.4	8.6	9.5	10.7	8.0	8.4	98.9
-Partly Cloudy	40	7.7	6.9	8.6	8.5	9.9	10.0	12.0	10.8	9.0	8.3	7.7	7.7	107.1
-Cloudy	40	14.8	13.1	14.3	14.3	14.4	12.3	11.6	11.6	11.6	12.1	14.3	14.9	159.3
Precipitation														
.01 inches or more	41	10.6	9.6	11.2	10.5	11.0	9.6	8.5	9.2	8.5	7.2	10.2	11.2	117.2
Snow, Ice pellets														
1.0 inches or more	41	2.2	1.9	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5	7.3
Thunderstorms	32	0.1	0.3	0.9	1.7	2.8	3.8	5.0	4.1	1.9	0.8	0.3	0.1	21.8
Heavy Fog Visibility 1/4 mile or less	32	3.2	2.8	3.4	3.1	4.3	3.7	1.9	1.1	1.2	1.5	1.5	1.9	29.5
Temperature °F														
-Maximum														
90° and above	24	0.0	0.0	0.0	0.0	0.2	1.0	3.0	1.7	0.4	0.0	0.0	0.0	6.1
32° and below	24	10.9	7.2	1.2	0.*	0.0	0.0	0.0	0.0	0.0	0.0	0.2	5.1	24.6
-Minimum														
32° and below	24	26.5	23.6	17.0	3.5	0.1	0.0	0.0	0.0	0.0	1.0	7.2	21.6	100.5
0° and below	24	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
AVG. STATION PRESS. (mb)	7	1016.9	1016.7	1016.2	1013.8	1014.0	1015.9	1014.7	1016.8	1017.7	1017.6	1017.0	1017.4	1016.2
RELATIVE HUMIDITY (%)														
Hour 01	14	69	67	69	70	79	83	82	83	83	77	75	72	76
Hour 07 (Local Time)	23	71	71	71	70	76	78	78	80	82	79	77	73	76
Hour 13	24	60	58	56	54	60	61	61	62	62	60	61	61	60
Hour 19	23	64	63	61	61	67	69	70	71	72	69	68	67	67
PRECIPITATION (inches):														
Water Equivalent														
-Normal		3.25	3.00	3.93	3.74	3.44	2.90	3.46	3.68	3.29	3.33	3.79	3.75	41.56
-Maximum Monthly	41	11.20	6.65	9.40	10.72	9.53	17.70	12.84	13.29	7.42	10.72	10.22	7.87	17.70
-Year		1979	1972	1953	1983	1989	1972	1971	1952	1960	1955	1972	1972	JUN 1972
-Minimum Monthly	41	0.40	0.43	0.69	0.69	0.41	0.07	0.47	0.72	0.43	0.33	0.36	0.33	0.07
-Year		1970	1987	1981	1985	1986	1949	1979	1981	1959	1963	1976	1955	JUN 1949
-Maximum in 24 hrs	41	4.55	2.31	4.60	3.32	3.23	6.89	5.95	3.97	4.67	4.28	4.07	3.69	6.89
-Year		1979	1969	1977	1980	1968	1972	1971	1955	1960	1972	1954	1968	JUN 1972
Snow, Ice pellets														
-Maximum Monthly	41	26.2	24.0	21.8	6.0	T	0.0	0.0	0.0	0.0	0.5	6.6	16.2	26.2
-Year		1965	1967	1967	1982	1977					1987	1989	1963	JAN 1965
-Maximum in 24 hrs	41	16.7	16.7	11.1	6.0	T	0.0	0.0	0.0	0.0	0.5	6.6	7.8	16.7
-Year		1978	1969	1967	1982	1977					1987	1989	1966	JAN 1978
WIND:														
Mean Speed (mph)	23	13.2	13.6	13.5	13.0	11.6	10.5	10.0	10.1	11.2	11.9	12.7	13.0	12.0
Prevailing Direction through 1963		NW	NW	NW	N	E	SW	SW	SW	NE	NE	NW	NW	NW
Fastest Obs. 1 Min.														
-Direction (!!)	29	34	34	08	32	34	29	29	04	18	09	14	25	18
-Speed (MPH)	29	67	65	58	55	50	38	40	58	74	58	58	53	74
-Year		1964	1969	1977	1962	1974	1978	1973	1976	1985	1980	1964	1962	SEP 1985
Peak Gust														
-Direction (!!)	6		N	NE	NW	SW	NW	N	SW	SW		SW		SW
-Speed (mph)	6	47	49	52	48	51	48	49	46	49	53	61	49	61
-Date		1985	1987	1984	1988	1989	1985	1989	1988	1989	1988	1988	1988	NOV 1988

TABLE 3-3
THREATENED, ENDANGERED, AND SPECIAL CONCERN SPECIES THAT POTENTIALLY OCCUR IN THE SAEP VICINITY

Common Name	Scientific Name	Federal Status[a]	Proposed State Status[b]
Plants			
Beach needlegrass	Aristida tuberculosa	NL	T
Sickle-leaved golden aster	Chrysopsis falcata	NL	E
Pygmyweed	Crassula aquatica	NL	SC
Saltpond grass	Diplachne maritima	NL	E
Seabeach sandwort	Honkenya peploides	NL	SC
Mudwort	Limosella subulata	NL	SC
Eastern prickly pear	Opunta humifusa	NL	SC
Panic grass	Panicum amarum	NL	T
Yellow-fringed orchid	Platanthera ciliaris	NL	T
Cursed crowfoot	Ranunculus sceleratus	NL	SC
Salt marsh bulrush	Scirpus cylindricus	NL	SC
Bayonet grass	Scirpus paludosus var. atlanticus	NL	SC
Coast violet	Viola brittoniana	NL	E
Birds			
Seaside sparrow	Ammodramus maritimus	NL	SC
Upland sandpiper	Bartramia longicauda	NL	E
Piping plover	Charadrius melodus	T	T
Horned lark	Eremophila alpestris	NL	T
Common moorhen	Gallinula chloropus	NL	T
Least bittern	Ixobrychus exilis	NL	T
Savannah sparrow	Passerculus sandwichensis	NL	SC
Ipswich sparrow	Passerculus sandwichensis princeps	NL	SC
Pied-billed grebe	Podilymbus podiceps	NL	E
Purple martin	Progne subis	NL	SC
Least tern	Sterna antillarum	NL	T
Roseate tern	Sterna dougallii	E	E
Reptiles			
Diamondback terrapin	Malaclemys terrapin terrapin	CS	NL

[a] T = Threatened
E = Endangered
CS = Candidate Species
NL = Not Listed

[b] T = Threatened
E = Endangered
SC = Special Concern
NL = Not Listed

TABLE 3-4
SUMMARY OF THE CULTURAL CHRONOLOGY OF THE SAEP AREA

(Source: Envirosphere Company, 1984)

Cultural Unit: Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
American	Activity Begins	Installation AD 1920 to Present	Industrial and residential. Building of dikes; cut and fill construction activities in what had been swampy and meadow land; filling-in of old shoreline.	Commercial, manufacturing and technology industries, urban market economy.	Subsurface utility lines, metal, glass, concrete, and brick construction materials; pavement; automobile, helicopter, airplane parts; shipping docks; American domestic material culture, high-technology-related items.
	Euro-American	AD 1639 to 1920	Plantation agriculature and livestock raising until early nineteenth century. Early nineteenth century until 1920 there is increasing population density in town center, but town is still rural in character.	Cultivation of grains-wheat, rye, corn, oats, flax, grass. Domestic production of cider, cider brandy, cheese, beef, pork, lard. Fishing and cattle-raising. Minimal mechanical and manufacturing employments.	Agricultural tools and implements; roads, fences, dwellings, barns; glass, metal, brick, and wood building materials; textiles.
	European-Native American Contact	AD 1550 to 1639	Cupheags spend spring and summer fishing and clamming on the shores of the Sound; settlements also practiced horticulture near the coast. Following 1639, the native communities remaining are moved to one of two reservations, outside of the present town of Stratford.	Continuation of hunting, fishing, gathering, horticulture, shellfish collecting with changes due to direct and indirect contact with Europeans.	Hoes, shell middens, triangular points (both lithic and from imported metals), items of European manufacture made for trade with New England native peoples, such as glass beads, bells, cloth.

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American	Activity Begins	Installation AD 1920 to Present	Industrial and residential. Building of dikes; cut and fill construction activities in what had been swampy and meadow land; filling-in of old shoreline.	Commercial, manufacturing and technology industries, urban market economy.	Subsurface utility lines, metal, glass, concrete, and brick construction materials; pavement; automobile, helicopter, airplane parts; shipping docks; American domestic material culture, high-technology-related items.
	Euro-American	AD 1639 to 1920	Plantation agriculature and livestock raising until early nineteenth century. Early nineteenth century until 1920 there is increasing population density in town center, but town is still rural in character.	Cultivation of grains-wheat, rye, corn, oats, flax, grass. Domestic production of cider, cider brandy, cheese, beef, pork, lard. Fishing and cattle-raising. Minimal mechanical and manufacturing employments.	Agricultural tools and implements; roads, fences, dwellings, barns; glass, metal, brick, and wood building materials; textiles.

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(Source: Envirosphere Company, 1984)

Cultural Unit: Tradition	Cultural Unit: Period or Phase	Cultural Unit: Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
	European-Native American Contact	AD 1550 to 1639	Cupheags spend spring and summer fishing and clamming on the shores of the Sound; settlements also practiced horticulture near the coast. Following 1639, the native communities remaining are moved to one of two reservations, outside of the present town of Stratford.	Continuation of hunting, fishing, gathering, horticulture, shellfish collecting with changes due to direct and indirect contact with Europeans.	Hoes, shell middens, triangular points (both lithic and from imported metals), items of European manufacture made for trade with New England native peoples, such as glass beads, bells, cloth.
Native American	Late Woodland	AD 1100 to 1550	Seasonal mobility with base camps; increased sedentism; higher population density. Coastal zone intensively occupied.	Introduction of cultigens; horticulture; hunting, fishing, gathering shellfish collecting.	East River Tradition pottery: East River cord marked, Bowmans Brook incised, Shantok incised wares, shell middens, triangular projectile points, bone points or awls, isolated burials, hoes, ornaments, dog burials, gorgets, Levanna points.

TABLE 3-4
SUMMARY OF THE CULTURAL CHRONOLOGY OF THE SAEP AREA

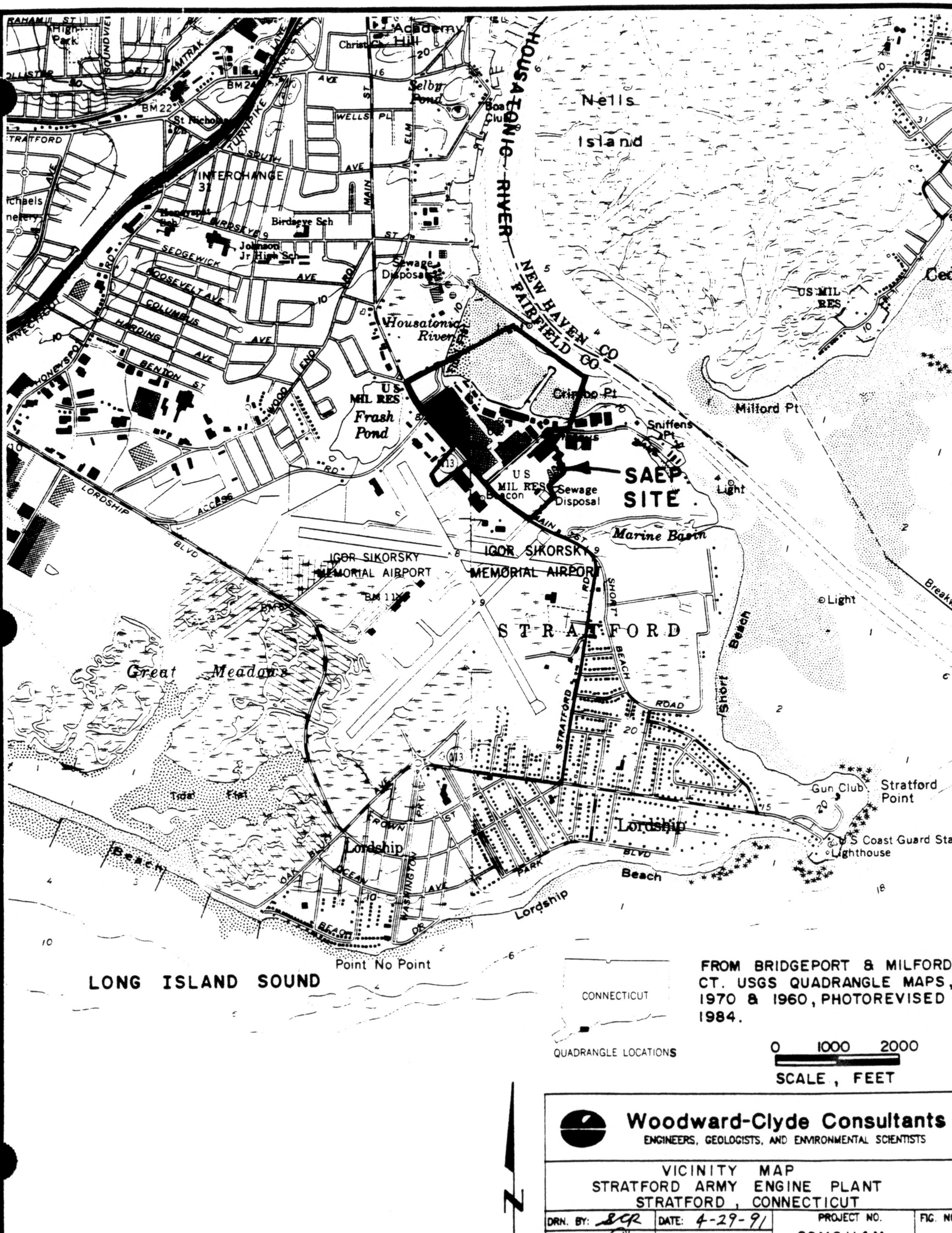
(Source: Envirosphere Company, 1984)

Cultural Unit: Tradition	Period or Phase	Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
	Middle Woodland	1000 BC to AD 1100	Seasonal mobility with base camps.	Hunting, shellfish collecting, wild vegetable food gathering, fishing.	Windsor Tradition pottery: Vinette interior cord-marked, Windsor fabric marked, Clearview stamped, Sebonac stamped, Niantic stamped wares. Shell middens, side-notched points, Meadowood points, knives, scrapers, ornaments.
Native American	Transi-tional	1300 to 1000 BC	Seasonal mobility with base camps.	Shellfish collecting; small-game hunting; gathering; fishing.	Mortar, pestles, gouges, adzes, knives, steatite bowls, narrow "fishtail" points, shell middens, dugouts, orna-ments.
	Late Archaic	2500 to 1300 BC	River-basin territoriality; decreased mobility; central-based foraging strategy with base camps. Seasonal aggregation and dispersal. Higher population density.	Shellfish collecting. Collection of seeds and nuts, small-game hunting.	Sylvan Lake points, Braveston points, Squibnocket points, Narrow point tradition, Snook Kill points, Atlantic points, knives, scrapers, ground-stone gouges and adzes, steatite bowls, shell middens, mortars, pestle-grooved oxes, celts, netsinkers, hammerstones.

TABLE 3-4
SUMMARY OF THE CULTURAL CHRONOLOGY OF THE SAEP AREA

(Source: Envirosphere Company, 1984)

Cultural Unit: Tradition	Cultural Unit: Period or Phase	Cultural Unit: Date	General Settlement Patterns	General Subsistence Systems	Kinds of Archeological Remains Representative of Period
	Middle Archaic	5000 to 2500 BC	Restricted foraging pattern; some larger sites. Sites have more varied locations and there are more sites than in the past, where sites are known.	Hunting of small and medium-mammals size on a seasonal basis. Seasonal shellfish collecting. Seasonal hunting of migratory birds. Seasonal gathering of vegetable foods.	Merrimack, Early Laurentian, Late Laurentian, few Neville or Stark points, scrapers, perforators, fishhooks. Evidence of long-distance trade or transport.
	Early Archaic	7000 to 5000 BC	Small, mobile bands, using seasonal base camps; where sites are known, these occur preferentially in the lowlands.	Foraging for large and small mammals; gathering of wild vegetable foods.	Bifurcate-base tradition. No known sites from SAEP.
	Late Paleo-Indian	9000 to 7000 BC	Small, mobile bands of hunters and gatherers.	Foraging for large and wild small mammals; gathering of vegetable foods.	Assemblages with late fluted point forms. Possible traces of Kirk traditions. No known sites from SAEP.
	Early Paleo-Indian	10,000 to 9000 BC	Small, mobile bands of hunters and gatherers. In areas with known sites, these occur on well-drained soil, such as on terraces, drumlins, knolls.	Hunting of large and small mammals; gathering of wild vegetable foods.	No known sites in area of SAEP. Kinds of artifacts expected: "Clovis" fluted point tradition, utilized flakes, gravers, bifacial knives, drills, small end-scrapers.



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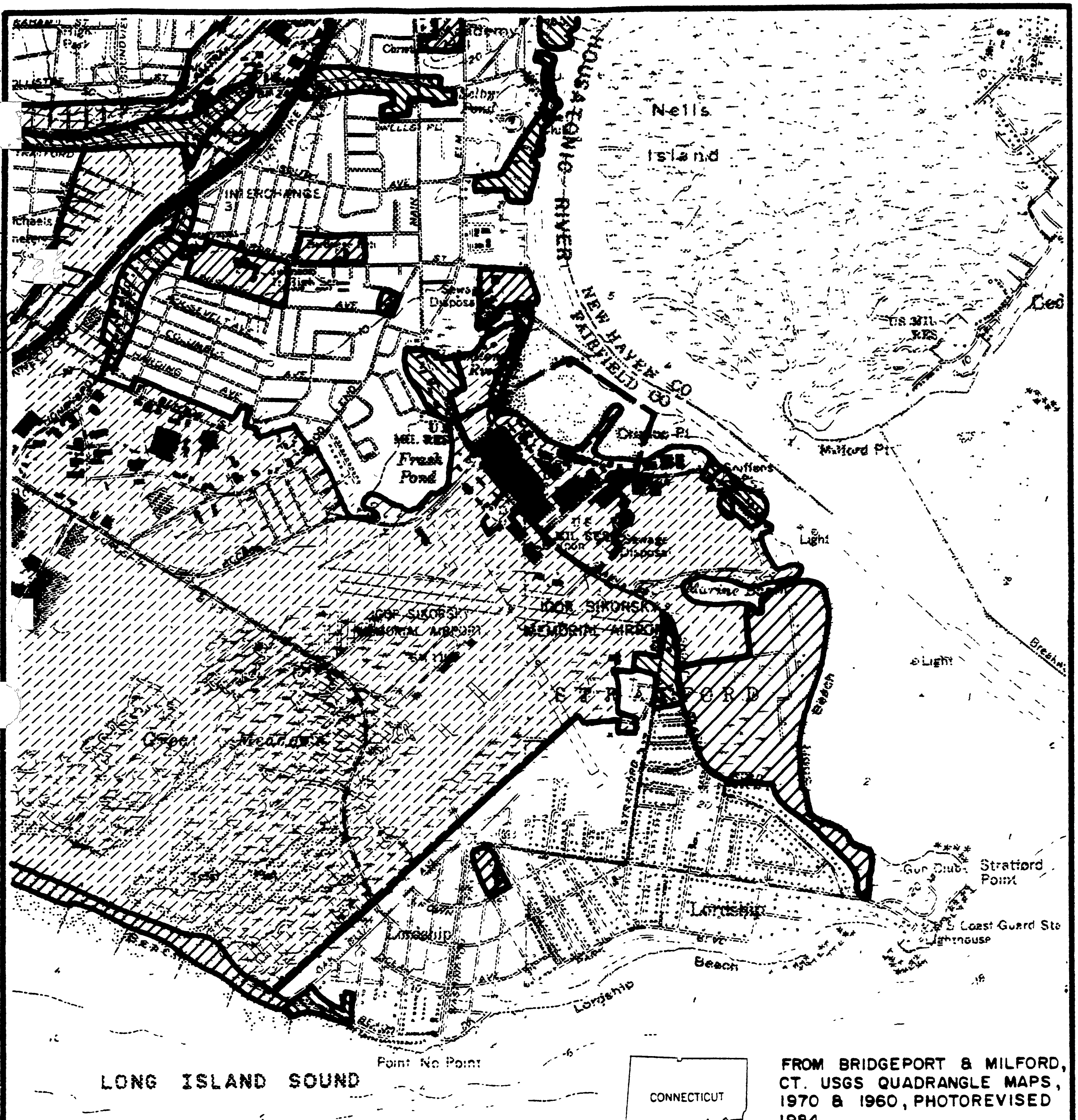
VICINITY MAP
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN. BY: SCR	DATE: 4-29-91	PROJECT NO.	FIG. NO.
CHK'D BY: JH	DATE: 5-2-91	89MC114M	3-1



LEGEND

- RESIDENTIAL
- COMMERCIAL / BUSINESS
- INDUSTRIAL
- MUNICIPAL

SOURCE : STRATFORD PLANNING & ZONING COMMISSION, 1988

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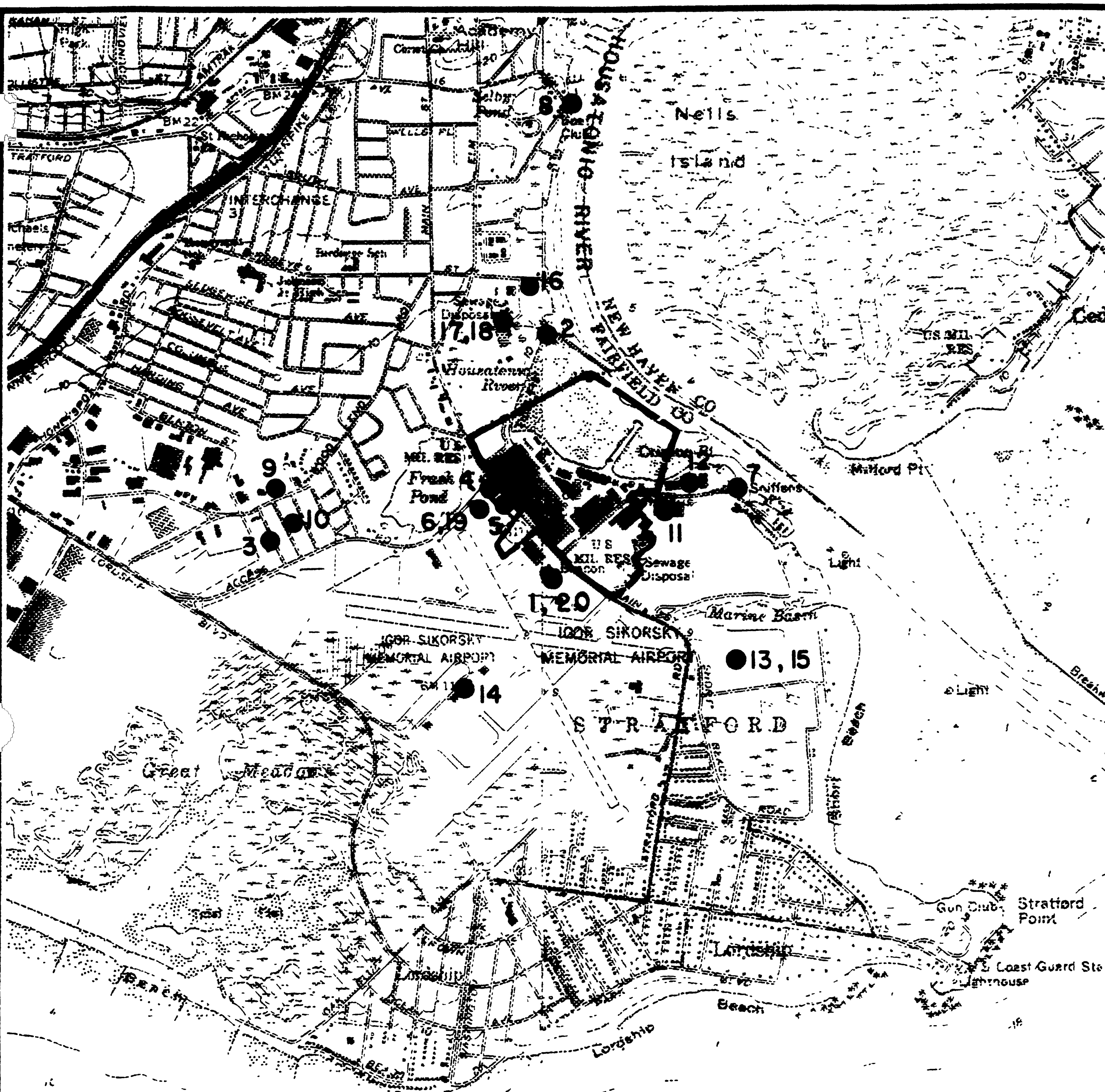
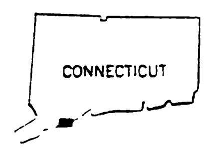
PLANNING ZONES IN SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY SCR	DATE 4-29-91	PROJECT NO	FIG NO.
CHK'D BY JJH	DATE 5-2-91	89MC114M	3-2



FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAPS, 1970 & 1960, PHOTOREVISED 1984.



QUADRANGLE LOCATIONS

0 1000 2000

SCALE, FEET

LEGEND

● 1 LOCATION OF SITE NO. 1 (SITE NUMBERS ARE GIVEN ON TABLE 3-1).

SOURCE: EAI DATABASE SEARCH

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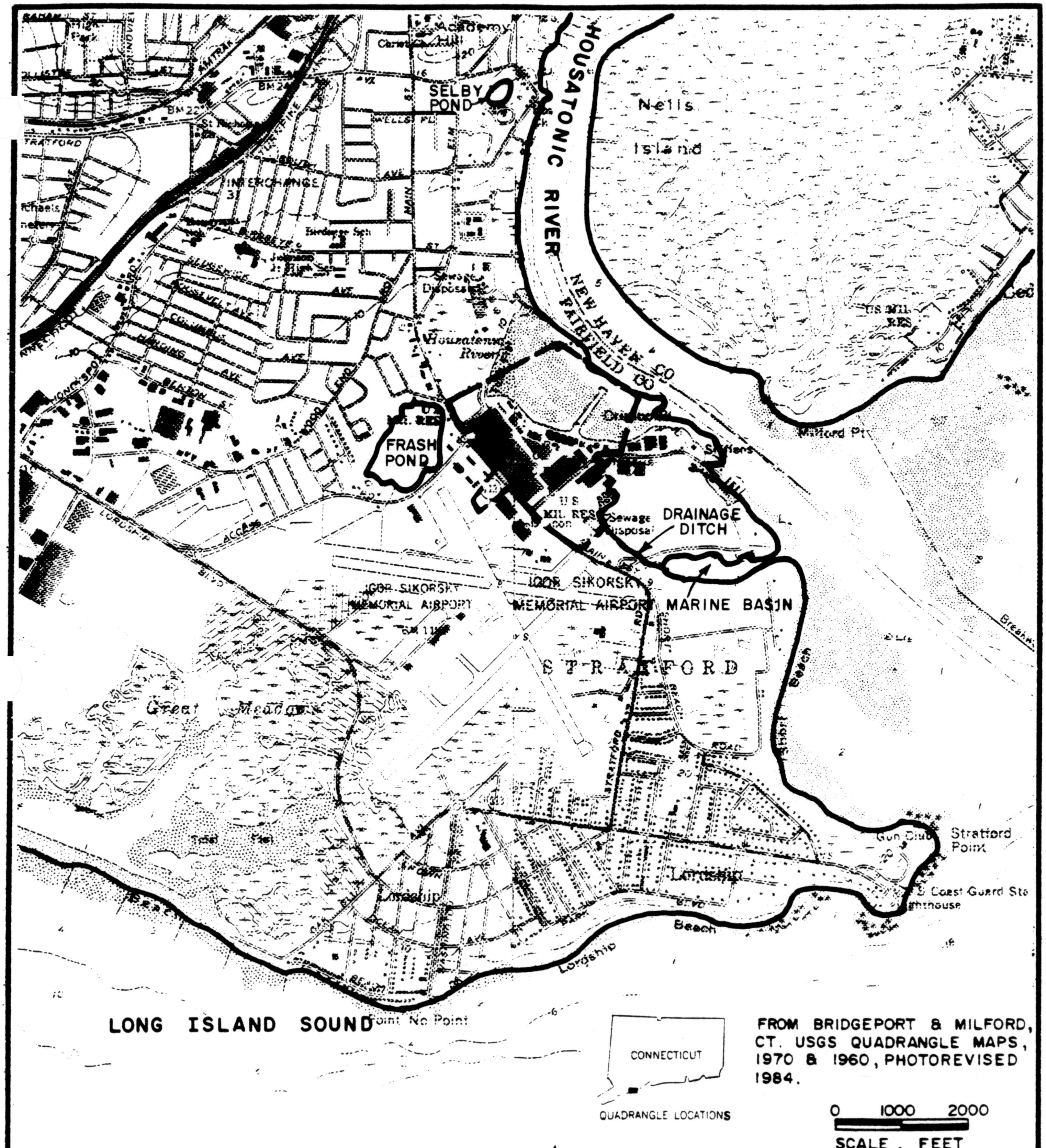
ADJACENT SITES WITH ENVIRONMENTAL RECORDS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY SCR	DATE 4-30-91	PROJECT NO	FIG NO.
CHK'D BY GJH	DATE 5-2-91	89MC114M	3-3



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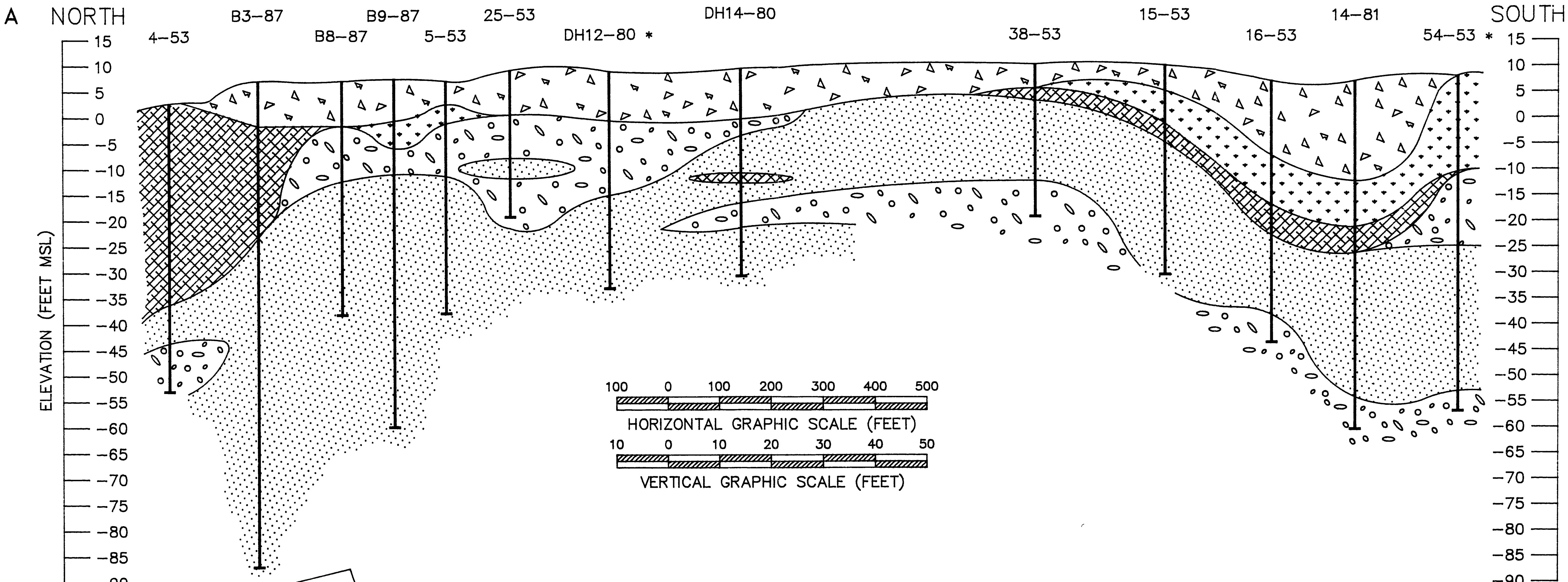
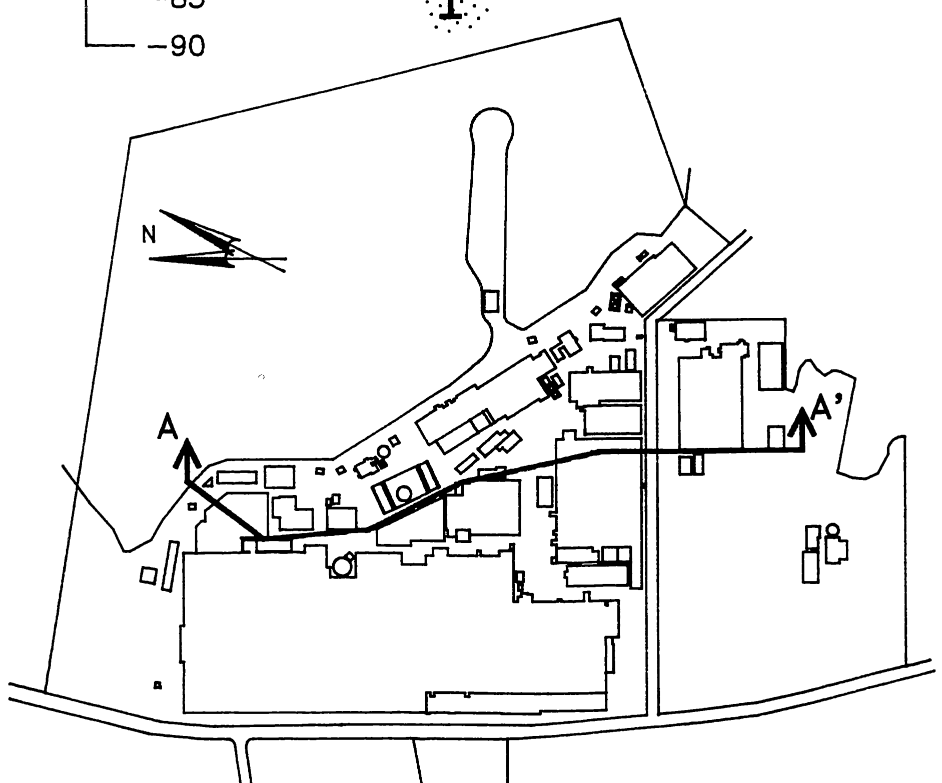
SURFACE WATER BODIES IN SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN. BY: SCR	DATE: 4-29-91	PROJECT NO.	FIG. NO.
CHK'D BY: SHH	DATE: 5-2-91	89MC114M	3-4





SITE PLAN
SCALE: NONE

LEGEND

FILL

PEAT

SILT

SAND

SAND AND GRAVEL

1-53 BORING IDENTIFICATION

BORING BOTTOM

* ESTIMATED SURFACE ELEVATION

NOTE:
THE GENERALIZED SOIL PROFILE REPRESENTS A WOODWARD-CLYDE CONSULTANTS INTERPRETATION OF BORINGS DONE BY OTHERS. ACTUAL SUB-SURFACE CONDITIONS MAY VARY.

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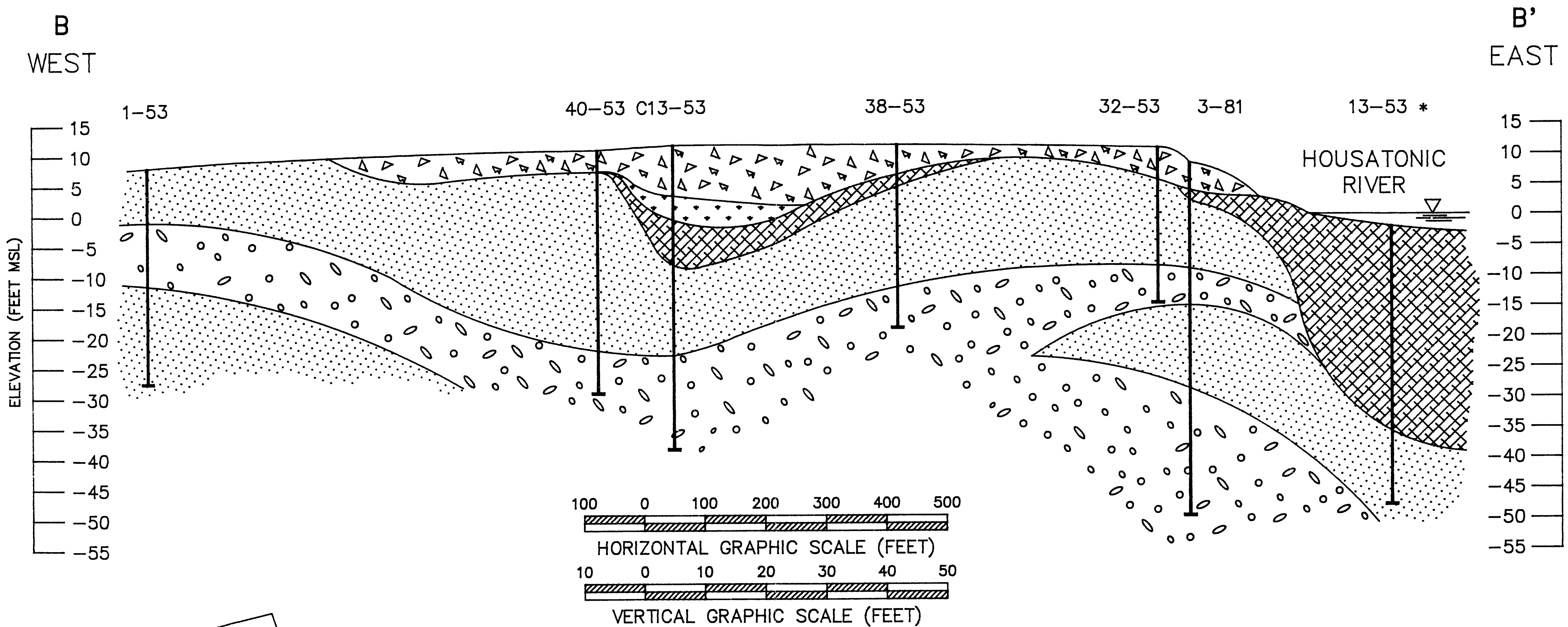
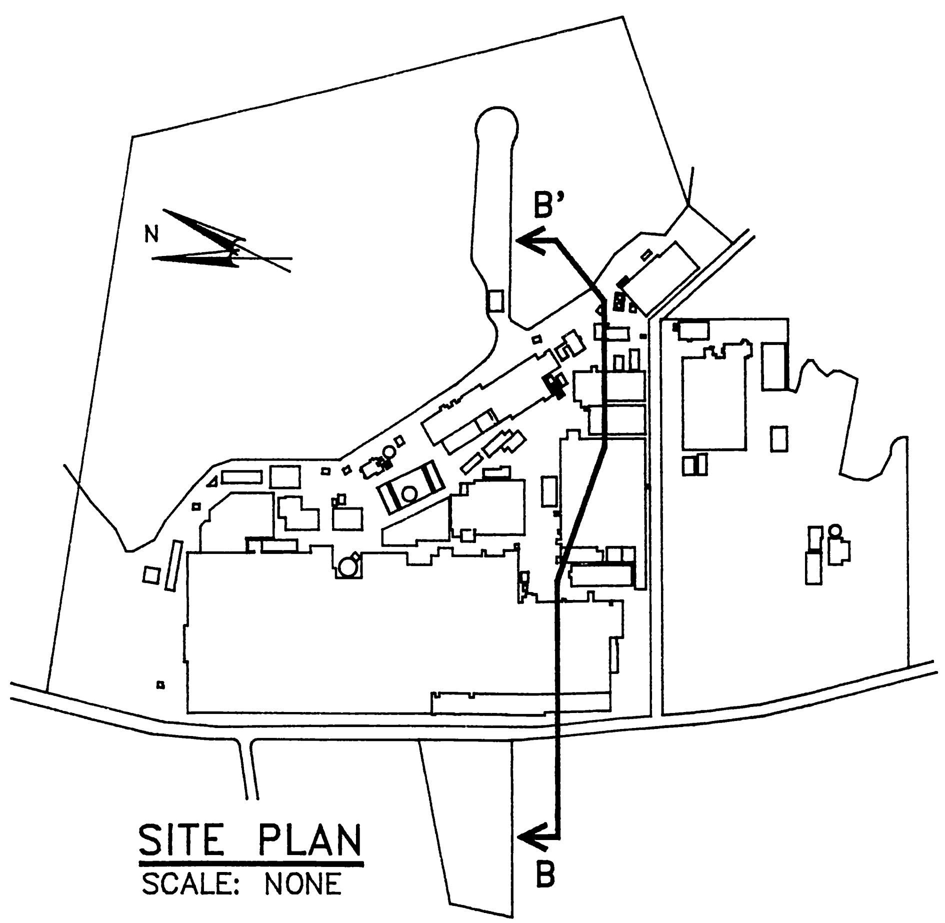
GEOLOGIC CROSS SECTION A-A'
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 3-5
CHK'D BY	JJH	DATE APRIL 1991		





SITE PLAN
SCALE: NONE

LEGEND

- FILL
- PEAT
- SILT
- SAND
- SAND AND GRAVEL
- 1-53 BORING IDENTIFICATION
- BORING BOTTOM
- * ESTIMATED SURFACE ELEVATION

NOTE:
THE GENERALIZED SOIL PROFILE REPRESENTS A WOODWARD-CLYDE CONSULTANTS INTERPRETATION OF BORINGS DONE BY OTHERS. ACTUAL SUB-SURFACE CONDITIONS MAY VARY.

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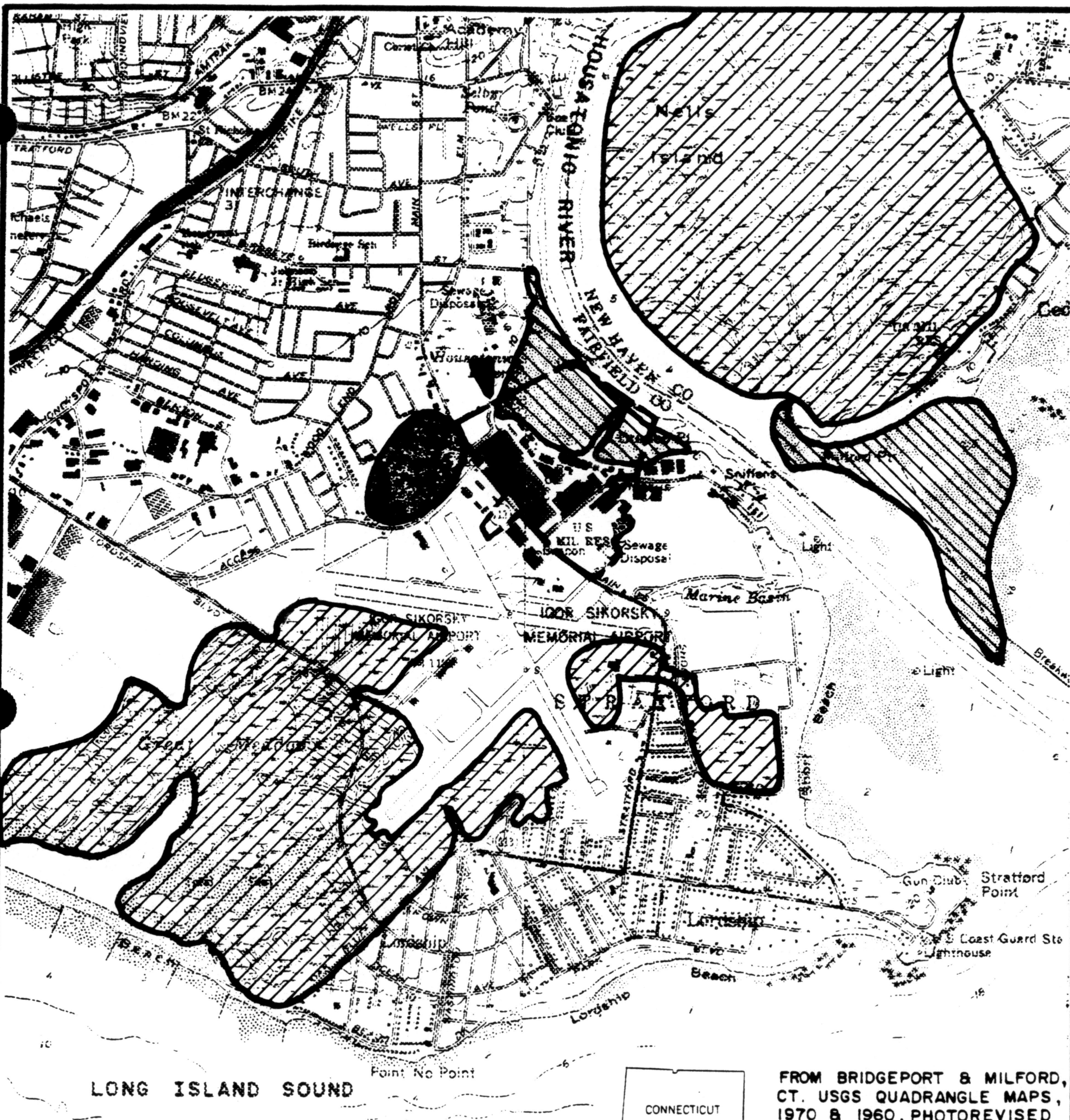
GEOLOGIC CROSS SECTION B-B'
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	3-6



FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAPS, 1970 & 1960, PHOTOREVISED 1984.

0 1000 2000
SCALE, FEET

LEGEND

- FRESHWATER WETLANDS
- SALT MARSH
- INTERTIDAL FLATS

N

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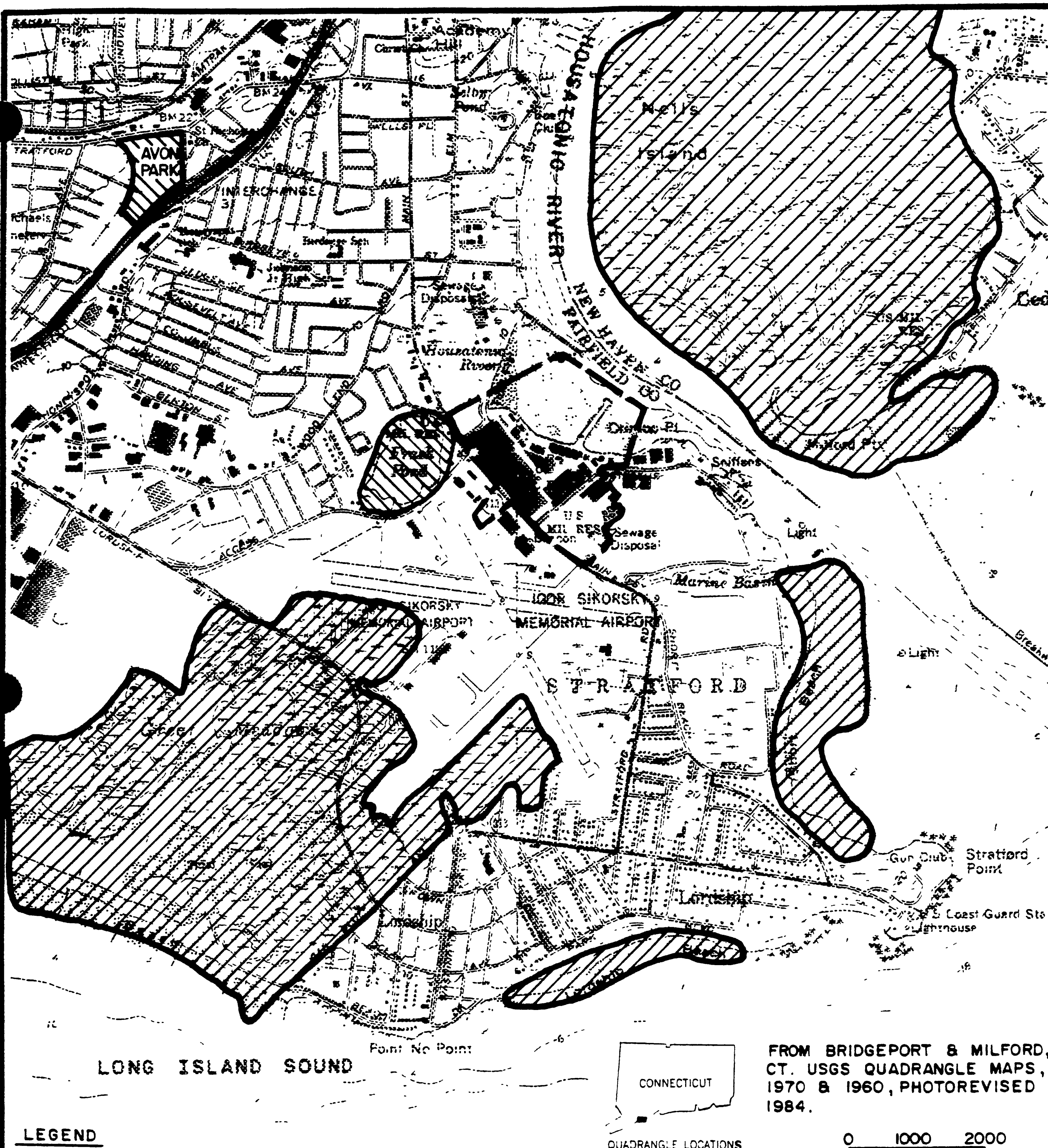
WETLANDS IN THE SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN. BY: SCR	DATE: 4-29-91	PROJECT NO.	FIG. NO.
CHK'D BY: JJH	DATE: 5-2-91	89MC114M	3-7



FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAPS, 1970 & 1960, PHOTOREVISED 1984.

0 1000 2000
SCALE, FEET

LEGEND

HISTORIC AREAS OF CONCERN

IMPORTANT EXISTING HABITAT AREAS

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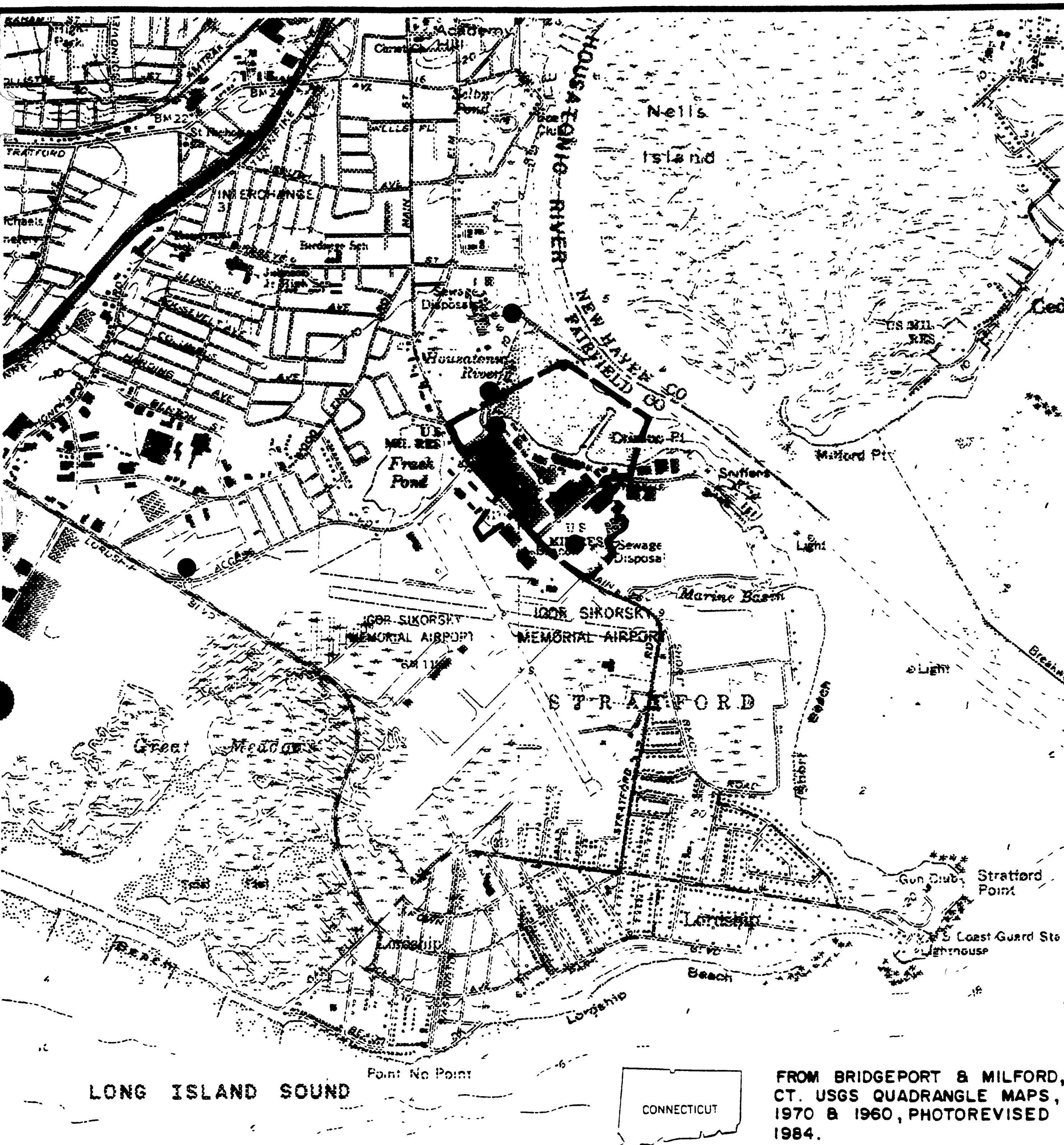
HABITATS IN SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY SCK	DATE 4-29-91	PROJECT NO	FIG NO.
CHK'D BY JJH	DATE 5-2-91	89MC114M	3-8



FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAPS, 1970 & 1960, PHOTOREVISED 1984.

0 1000 2000

SCALE, FEET

LEGEND

● ARCHEOLOGICAL SITES

SOURCE: BELLANTONI, 1991

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KNOWN ARCHEOLOGICAL SITES IN SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	DATE	PROJECT NO	FIG NO.
SCR	4-29-91	89MC114M	3-9
CHK'D BY QA	DATE 5-2-91		

QUADRANGLE LOCATIONS

FROM BRIDGEPORT & MILFORD, CT. USGS QUADRANGLE MAPS, 1970 & 1960, PHOTOREVISED 1984.

0 1000 2000
SCALE, FEET

LEGEND

- MARINA / BOAT MOORINGS
- SHORT BEACH RECREATION AREA AND GOLF COURSE
- REMINGTON GUN CLUB
- SPORT FISHING AREA

N

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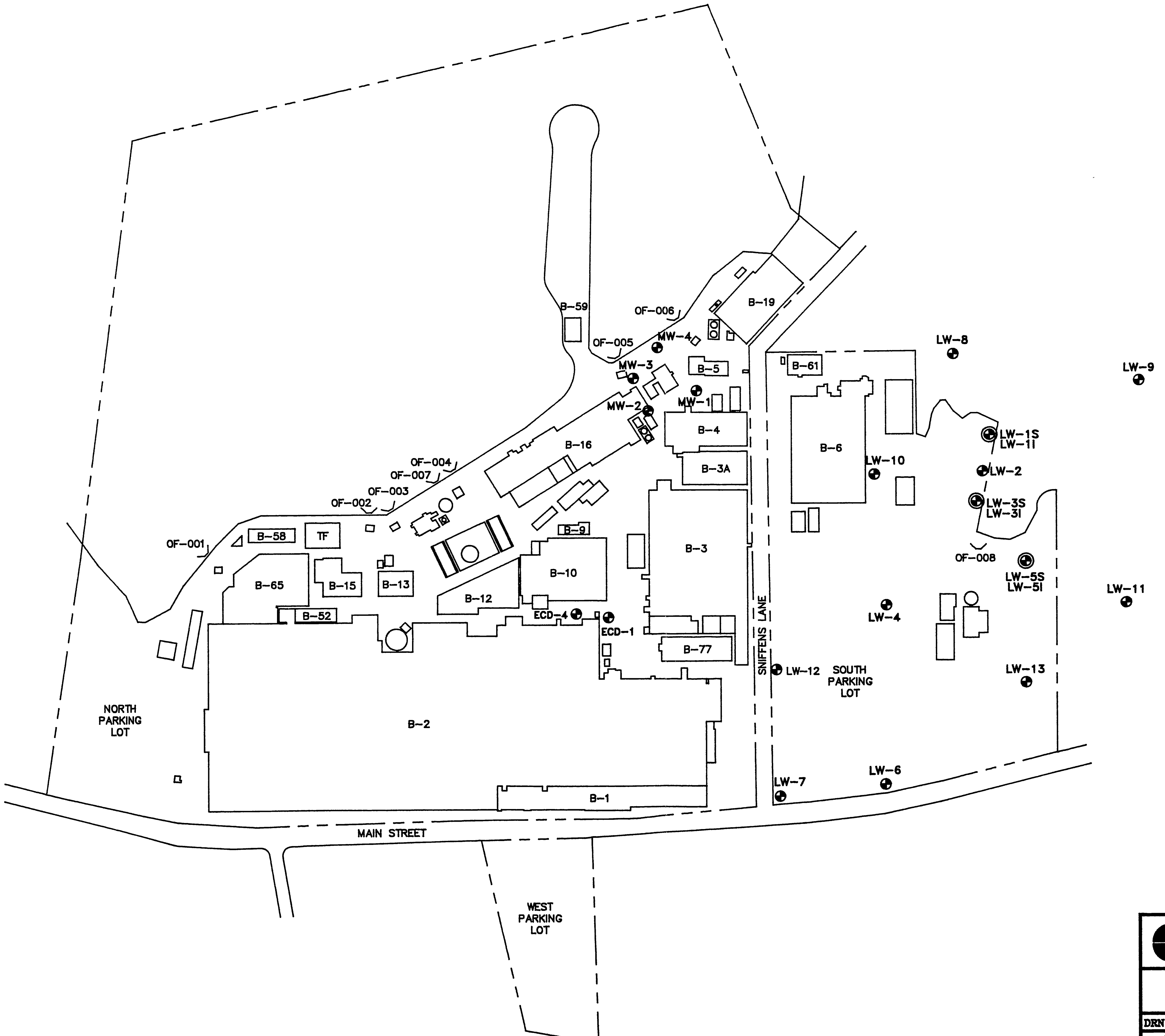
RECREATION AREAS IN SITE VICINITY
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN. BY: ECR	DATE: 4-29-91	PROJECT NO.	FIG. NO.
CHK'D BY:	DATE:	89MC114M	3-10

CAD FILE: 89114-54.DWG



LEGEND

PROPERTY LINE

EXISTING MONITORING WELL LOCATION

EXISTING PAIRED MONITORING WELL LOCATION

NOTES:

1. WELL LOCATIONS ARE APPROXIMATE.
2. BECAUSE OF NAME DUPLICATION, SOME OF THE EXISTING WELLS HAVE BEEN RENAMED FOR THE PURPOSES OF THIS STUDY. ONLY THE LETTERS (IE. MW) IN THE NAMES HAVE BEEN CHANGED.

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MONITORING WELL LOCATIONS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY MG/EAB	DATE DEC. 1991	PROJECT NO. 89MC114M	FIG. NO. 3-11
CHK'D BY MEC	DATE DEC. 1991		

4.0
ANALYSIS OF SITE CONDITIONS

4.1 HISTORY OF SAEP

The first manufacturing facility at the SAEP property was constructed on about 26 acres in 1929. Prior to that time, the land use in and around the plant was agricultural. Since 1929, the plant has expanded by the acquisition of land and construction of buildings. SAEP now consists of 48 buildings situated on about 126 acres. The historical growth and use of SAEP property is documented by aerial photography, site plans, property maps/titles/deeds, and reports done by others (EPA, 1990; BTI, 1984; Stine, 1983).

The expansion of plant property as well as building construction from 1929 to present is shown in the aerial photographs and site plans of Figures 4-1 through 4-10. A list of buildings and their construction dates is provided in Table 4-1. A chronology that includes the history of property usage, property acquisition, and building construction is provided in Appendix C. For purposes of clarity in this report, all building numbers (e.g. B-1, B-2, etc.) are referenced to their current designations, although the numbers have changed throughout the life of the plant.

4.1.1 Sikorsky Aero Engineering Corporation/Sikorsky Aviation Corporation (1929 to 1939)

The Sikorsky Aero Engineering Corporation was established in March 1923. Sikorsky manufactured twin-engine metal sea planes at a plant on Long Island, New York, from 1923 to 1929. In July 1929, Sikorsky Aero Engineering Corporation became a subsidiary of the United Aircraft and Transport Corporation of East Hartford, Connecticut. At that time, Sikorsky erected a plant on about 26 acres in Stratford, Connecticut. Sikorsky continued to develop and manufacture sea planes at the Stratford plant from 1929 to 1939.

The original Stratford plant consisted of an administration building, a manufacturing facility, and a service building. In 1930, another 11 acres of land was acquired and an engineering building was added. These buildings, which have been renovated and/or expanded, are still in use and are now identified as B-1, B-2, B-10, and B-3, respectively (see Figures 4-1 and 4-2). A 1929 site plan indicates that the west and south sides of B-3 are constructed on up to 5 feet of fill that was placed in a low-lying area at the head of the drainage ditch that runs to the Marine Basin.

The 1,000 foot-long by 30-foot-wide causeway from land to the deep waters of the Housatonic River was constructed in the early 1930s. The causeway served to launch seaplanes. No documentation was found to indicate the type of fill materials used.

4.1.2 Vought-Sikorsky Aircraft/Chance Vought Aircraft (1939 to 1948)

Sikorsky experienced economic difficulties in the latter part of the 1930s, and production at the plant nearly halted in 1938. Chance Vought Aircraft, another subsidiary of United Aircraft and Transport Corporation, relocated to the Stratford plant in April 1939, and the new subsidiary became known as Vought-Sikorsky Aircraft Division.

At the outbreak of World War II in 1939, United Aircraft decided to abandon the manufacture of seaplanes. Following this decision, Sikorsky launched a research project to develop the helicopter, and the prototype made its first free flight at the Stratford plant in May 1940. The U.S. Army Air Corps ordered production models of the helicopter, and their manufacture started at the Stratford plant in 1942. Meanwhile, the "Kingfisher" airplane which had been developed by Chance Vought in the mid-1930s for the U.S. Navy, was mass produced at the Stratford plant from 1940 to 1942. Chance Vought also developed the "Corsair" for the U.S. Navy from 1938 to 1940, and mass production of the Corsair began in June 1941. Sikorsky left the Stratford plant in January 1943 to manufacture helicopters in Bridgeport, Connecticut.

To accommodate the wartime production demands for the Corsair, extensive additions were made to the original Sikorsky plant. An aircraft assembly plant addition was constructed on the north end of the manufacturing facility (B-2) in 1942, and a second addition was constructed north of the 1942 addition in 1944. Other buildings constructed during this time period are listed in Table 4-1, and shown in Figures 4-3, 4-4, and 4-5.

In 1944, the shoreline of the plant was extended eastward into the intertidal flats of the Housatonic River. Based on historical photographs, the source of fill was river sediments that were dredged and then placed hydraulically. This filling operation increased the area of land at the plant by about 10 acres.

Chance Vought developed its first jet aircraft from 1944 to 1946. Production of the first three models was underway in 1948 when Chance Vought moved its operations to Texas.

4.1.3 Vacant (1948 to 1951)

Chance Vought moved its entire manufacturing operation to Texas in 1948. Following that, a severe flood of the Housatonic River rendered the Stratford plant's 1,580,000 square feet of manufacturing space unusable. The plant was listed for sale, and in 1951 the U.S. Air Force purchased the plant and renamed it Air Force Plant No. 43.

4.1.4 Air Force Plant No. 43/Bridgeport Lycoming Division (1951 to 1976)

In February 1951, the Avco Corporation, through its Bridgeport Lycoming Division, occupied the Stratford plant as the contractor for the U.S. Air Force. Water-damaged buildings at the plant were repaired and the dike along the Housatonic River was constructed for flood protection.

Avco produced the Curtis Wright nine-cylinder radial engine and major components of the J-47 jet aircraft engine. Avco also developed and manufactured various gas turbine helicopter engines throughout the remainder of the 1950s. During the 1960s and early 1970s, Avco continued to develop and manufacture turbine engines for more diversified uses, such as helicopters, amphibious hydrofoils, hovercraft, and land vehicles. Avco also manufactured reentry vehicles for the Titan and Minuteman missile system.

Machinery for manufacturing aircraft engines was installed in May 1951, and the plant was equipped for electroplating operations at this time. In 1953, Avco constructed an aircraft engine test cell building (B-16) for acceptance testing. In 1958, the chemical waste treatment plant (CWTP) was put into operation; and in 1975, the OATP was constructed. Other buildings constructed during this period are listed in Table 4-1 and shown in Figures 4-6, 4-7, and 4-8.

4.1.5 Stratford Army Engine Plant/Avco Lycoming or Textron Lycoming, Stratford Division (1976 to Present)

The Stratford plant was transferred from the U.S. Air Force to the Army in 1976. At that time the plant was renamed the Stratford Army Engine Plant. In 1978, Avco was contracted by the Army to manufacture the AGT-1500 engine to power the Abrams tank. Avco also developed and manufactured aircraft, marine, and industrial engines. Avco Lycoming merged with Textron in December 1985 and formed the Textron Lycoming Stratford Division. Today, turbine engines continue to be developed, manufactured, and tested at SAEP for military and commercial aircraft as well as land vehicles.

Since 1976, the USDA and Avco-Textron/Lycoming has invested considerably in improvements to the plant's property and equipment (AMC, 1988). In 1986, a modern cyanide/chromium treatment facility was constructed and improvements were made to CWTP. Other buildings constructed from 1976-1991 are listed in Table 4-1. A 1980 aerial photograph of the site is shown in Figure 4-9, and a site plan showing new construction over this time period is shown in Figure 4-10.

4.2 INDUSTRIAL OPERATIONS

A detailed account of current industrial operations, chemical materials used, and generated waste is provided in the Waste Minimization Study for SAEP (INEL, 1991). Operational information is also contained in the Installation Assessment of SAEP (ESE 1981). Information regarding manufacturing operations and chemical materials used prior to the early 1970s is limited. This limitation should not, however, affect the conclusions of this study. Even though manufacturing processes have changed over the past 60 years, many of the types of chemical products used (e.g. acids, hydroxides, oils, and fuels) at SAEP have not changed significantly over that time period.

It should be noted that SAEP does not have a system whereby raw materials and generated wastes are tracked and accounted for. Such a tracking system is recommended in the Waste Minimization Study Informal Report. At this time, accurate tracking of raw materials used by each department at SAEP versus wastes generated at SAEP cannot be made (INEL, 1991).

Industrial operations with potential environmental impact at SAEP may be categorized into the following processes: machining; ECM; electroplating; corrosion prevention; cleaning; miscellaneous treatments; and engine testing. Other operations at SAEP in support of manufacturing include maintenance, stockpiling and storage of raw and finished materials and wastes, wastewater treatment, and waste recycling/recovery. The plant operations use a large variety of materials which may eventually become waste, either by degradation of their performance characteristics or by mixing with other materials. A summary of the manufacturing operations at SAEP, including the primary types of chemicals used during each process, as well as a description of waste generated and the waste's fate, is provided in Table 4-2. A database listing of chemicals for which SAEP maintains Material Safety Data Sheets is provided in Appendix D.

4.2.1 Machining

Machining processes at SAEP include broaching, drilling, grinding, lathing, stamping, and forging. Most of the machining processes at SAEP are associated with production work done in B-2 (see Figure 2-1). Machining is also done for production of recuperators in B-10, and for experimental development and testing in B-3 and B-6 (see Figure 2-1).

A variety of fluids are used in machining:

- Cutting oils and coolants are required for many metal working processes to reduce friction, cool the tool and workpiece, and remove metal chips from the working surface.

- Oils, greases, and hydraulic fluids are used to lubricate internal machine parts and transfer of hydraulic energy, respectively.

- Penetrants are used to aid in the inspection of finished pieces for hairline fractures and defects.

Most of the wastes generated by metal working processes at SAEP are associated with coolants. Prior to mid-1990, coolants entered the waste stream as waste water soluble oil, or as halogenated solvent waste if the coolant mixed with a solvent such as 1,1,1-trichloroethane (TCA). The coolants were pumped into vacuum carts, dumped into concrete pits north of B-13, and then pumped into waste oil tanks in at the tank farm. Since mid-1990, a coolant recycling unit has been used to practically eliminate this waste stream. Coolants continue to enter the waste stream in small amounts because they stick to the metal cuttings, which are dumped into a steel-lined, concrete pit on the west side of B-13. The coolants drain from the cuttings into a sump, where they are pumped by vacuum cart and transferred into a waste oil tank at the tank farm (see Figure 4-11).

Waste lubricating oils, greases, and hydraulic fluids from manufacturing machinery are not major contributors to the waste stream at SAEP. These noncontact fluids are contained in reservoirs at each tooling machine and are not as prone to contamination by metal chips and dust. When a fluid is changed, or when there is a leak or spill, it enters the waste stream as waste oil.

A florescent penetrant is used for inspection of machined workpieces for hairline fractures and other imperfections. Prior to late 1989, penetrant-contaminated wastewater was treated on site and the resulting waste sludge was disposed of off site.

In 1989, a penetrant wastewater process system was installed. Wastewater is continually processed through two 200-pound disposable carbon filters. Processed water is discharged to the OTAP, and the spent carbon filters are recycled off site.

4.2.2 Electrochemical Machining (ECM)

ECM is a process whereby a metal workpiece is placed into a salt brine bath and then cut using an arc welder. This results in more rapid cutting of the metal. The ECM process was decommissioned in 1987, and is no longer used at SAEP. Wastewater from the ECM process had been treated on site, and resulting waste sludges were disposed of off site (AMC, 1987).

4.2.3 Electroplating

Electroplating is a process whereby metallic coatings are ionically deposited on other metal surfaces by the induction of an electrical current to a solution. Electroplating operations began at SAEP in 1951 (Avco, 1976). Electroplating at SAEP has included chromium, nickel, copper, and cadmium plating; however, cadmium plating is no longer done. The southwest part of B-3 was formerly used for electroplating. This area of B-3 is no longer used for electroplating, and it currently houses the main frame computer for SAEP. A new floor was constructed above the old, and numerous cables were noted beneath new floor grates during the site reconnaissance.

The electroplating shop is currently situated in the southeast corner of B-2. The shop is currently comprised of 23 chemical tanks, 40 operating flow water rinsing tanks, and 2 vapor degreasing tanks. Schematic diagrams and tables describing the electroplating process diagrams are contained in Waste Minimization Study (INEL, 1991).

Wastes from electroplating operations include: cyanide, chromium, nickel, copper, and acids. Hydroxide-contaminated wastewater and halogenated solvents are also generated as part of the cleaning processes required at various steps in the plating operations. Wastewater generated by electroplating enters the waste stream through floor drains.

Cyanide-contaminated wastewater is routed to the cyanide destruction facility (CDF), and from there to the CWTP. CDF was constructed in 1986, and prior to that time cyanide wastewaters were piped directly to CWTP for treatment. Other plating wastewater is routed directly to CWTP. Chlorinated solvent wastes from the vapor degreaser are removed by vacuum cart and pumped into the halogenated waste solvent tank at the tank farm (see Figure 4-11).

4.2.4 Corrosion Resistance

Various surface finishing technologies are used at SAEP to impart corrosion resistance to metallic surfaces, as follows:

- Aluminum - anodizing, chemical coating, and painting;
- Magnesium - HAE anodizing, dichromate finishing, painting, and plasma spraying; and
- Steel (various grades) - black oxidation, phosphate finishing, passivation, painting, oil slushing, and plasma spraying.

Surface finishing is done at B-2.

The anodizing of aluminum, HAE anodizing of magnesium, and passivation of steel are accomplished by placing the work piece in an acid bath and imposing an electrical current. This produces an oxide coating on the metal that is corrosion resistant or provides a foundation for other finishes, such as paint. The acids enter the waste stream as wastewaters that are routed to CWTP and treated. The other finishes listed above are done without an electrical current. Chemical coating, dichromate finishing, black oxidation, and phosphate finishing generate wastewaters that are also routed to CWTP for treatment (see Table 4-2 for types of chemicals required by each finish).

Paints used currently or in the past include epoxies, enamels, silicones, and zinc chromate primers. There are three dry paint spray booths near the plating room in B-2. The booths are about 4-feet by 4-feet by 10-feet, and equipped with filters. At present, painting is limited to small quantities that are brushed on to the workpiece. Used filters, paint sludge, and waste thinners are drummed and enter the waste stream as hazardous (ignitable) solid waste, or as nonhalogenated solvents.

Painting was apparently the primary finishing process at the plant during the 1940s when the plant was used to assemble aircraft such as the Corsair. From 1941 to 1949, paint and waste solvents from the paint shop were reportedly piped to a septic tank between B-2 and B-3. Most of the paint used at that time was zinc chromate primer (ESE, 1981). Recent excavations for construction of B-65 uncovered an area of paint-contaminated soil that was subsequently removed and disposed of off site as hazardous waste.

For temporary corrosion protection, SAEP uses a blended slushing oil. The slushing oil provides a thin coating on the metal which can be easily removed for further processing at a later time. Spent slushing oil is collected by vacuum cart, dumped into a concrete pit north of B-15, and pumped to a waste oil tank in the tankfarm (see Figure 4-11).

4.2.5 Cleaning

Metal surfaces must be cleaned before applying a finishing coat. Cleaning is a necessary part of the electroplating, corrosion prevention, and heat treatment processes in B-2. Cleaning of engine parts is done in B-16. Cleaning products used at SAEP include halogenated and non-halogenated solvents, hydroxides, acids, detergents, and abrasives (see Table 4-2).

Halogenated solvents are widely used at SAEP as degreasers. There are 38 vapor degreasing units in B-2 and B-3, and TCA is the most predominantly utilized solvent (INEL 1991). Spent halogenated solvents from the vapor degreasing units are removed using a vacuum cart and then pumped into a waste solvent tank at the tank farm. Halogenated solvents also enter the waste stream from engine cleaning and component testing in B-16 and B-19, and from maintenance activities in B-9. Nonhalogenated solvents such as paint thinners, alcohols, and mineral spirits have been or are currently used at SAEP. Freon is used in one vapor degreasing unit and is also used for wipe and touchup cleaning (INEL, 1991).

Varsol (a highly volatile mineral spirit) was reportedly used in large quantities at SAEP prior to 1985; however, since 1985 all Varsol solvents have been replaced by TCA. Based on interview information, other solvents such as carbon tetrachloride and trichloroethene (TCE) were used in the past.

Emulsion cleaning utilizes an organic solvent, detergent, and water mixture. Spent emulsion wastewater is collected by vacuum cart and stored in a waste oil tank at the tank farm, where the oil and water is allowed to separate. Water is pumped out and treated at OATP. Engine cleaning after testing at B-16 is now done using an emulsion cleaner.

Hydroxides and acids are used throughout the electroplating and corrosion resistance processes at B-2 to prepare the metal surface for the desired finish. When the hydroxide or acid solutions are no longer useable, the wastes are dumped into pipes that drain to CWTP where the wastewaters are treated. Wastes from the periodic reverse anodic cleaning process are cyanide contaminated, so wastewater from this tank is treated at CDF before going to CWTP. Prior to the construction of CDF in 1986, cyanide wastewaters were piped directly to CWTP for treatment.

Abrasive blasting and abrasive slurry cleaning using sand, glass beads, and grit is also done at B-2. These types of cleaning are used to remove rust or scale buildup and to smooth edges or other imperfections following machining. Waste from these processes typically collected by container and enter the waste stream as nonhazardous solid waste. In cases where contamination by solvents or oils is possible, the waste material is tested before being disposed.

4.2.6 Miscellaneous Processes

Various miscellaneous processes at SAEP include coating metal parts with solid film lubricants, masking, peening, and heat treatment.

Solid film lubricants are used to lubricate surfaces in many sliding applications, to provide anti-seize coatings for parts that move infrequently, and to coat closely mated parts that are subject to vibration. One of three procedures to apply the coating are followed at SAEP, and each procedure makes use of materials which contain volatile organic compounds (INEL, 1991). No manifest records were found to indicate what, if any, hazardous materials are generated and disposed of from this process.

Masking is done to seal off areas of a metal workpiece during plating or other finishing process. Typical maskants used at SAEP include wax, lacquer, tape, rubber, and plastic. No information was found to indicate how waste maskants are handled.

Shot peening is a process whereby a metallic surface is subjected to impact, which modifies the metallurgical properties and smooths sharp points or edges. Ceramic and glass beads are typically used at SAEP for shot peening, and wastes generated by this process are containerized and enter the waste stream as nonhazardous solid waste.

Heat treatment of metal parts is done to improve their metallurgical properties. Heat treatment at SAEP is done in B-2 next to the boiler room. Prior to heating, the metal parts are cleaned in various alkaline or acid baths. After cleaning, the metal part is subjected to heat in one of several furnaces and then quenched in water.

4.2.7 Engine Testing

Engines are tested in test cells which have been constructed in B-16 and B-6. Engine testing at SAEP began in the early 1950s. Each test may run from several minutes to thousands of hours, but a typical production test may last between 3 and 6 hours. In addition to engine testing, some assembly and disassembly of engine parts is done.

Based on interview information, large amounts of solvents have been used for cleaning test engines, including: carbon tetrachloride, TCE, Varsol, and TCA. Waste solvents were reportedly dumped into floor drains of test cells. These drains have been piped directly to OATP since 1976; however, prior to that time, the drains ran to an oil/water separator on the west side of B-16 and then to plant outfalls along the Housatonic River. The drains at B-16 are now plugged with a sludgelike mixture that potentially contains halogenated solvent, oil and grease, and fuel. The iron drain pipes need to be replaced because of internal corrosion caused by solvents (SAEP, 1991).

Emulsion cleaning replaced solvent cleaning of test engines in 1990. Current practice is for a maintenance crew to collect wastes from this process using a vacuum cart. The wastes are dumped into tanks within a concrete pit north of B-13, and then pumped into waste oil tanks located at the tank farm. Waste oil/fuel and wastewater are allowed to separate in the tank, and wastewater is drained to OATP for treatment. Waste oil/fuel is disposed of off site.

Mercury manometers were formerly used at the engine testing facilities to measure engine system pressure. Occasionally, a high pressure surge would blow the mercury out of the manometer tube and onto the ceilings, walls, and floors. Mercury was reportedly handled carefully because of its cost; however, little mercury was recovered from the described accidental spills. It is possible that mercury entered floor drains, or that mercury is still present in building cracks or floor/wall interfaces.

4.2.8 Maintenance

General automotive maintenance and repair is done in B-9. Waste motor oils and other waste fluids (brake fluid, transmission fluid, etc.) are collected in sumps, which are pumped daily and transferred to the waste oil tank for later recycling. Vehicle motors are overhauled in B-12. According to interview information, the maintenance department at SAEP is responsible for blending oils in B-15, dispensing them to workstations, and collecting waste oils.

4.3 ACCUMULATION AND STORAGE

4.3.1 Storage Tanks

There are currently 64 storage tanks at SAEP (58 aboveground and 6 underground) used to store liquid products and wastes (see Table 4-3 and Figure 4-11). Storage tanks at SAEP are used to store: fuel oil for the boiler; fuel for engine testing; diesel fuel for compressors and generators; solvents for degreasing and other metal cleaning; water for extinguishing fires; waste oil and chlorinated waste oil; waste fuels; waste TCA; and waste volatile solvents.

All but two of the aboveground storage tanks are currently situated on concrete pads and have concrete containment dikes. The two exceptions are the oil-alum tank at B-13, which is not surrounded by a concrete containment dike, and the 400,000 gallon fuel oil tank next to B-44 which is underlain by a synthetic liner rather than a concrete pad. A storm drain was observed to be within about 50 feet of the uncontained oil-alum tank.

Based on a review of historic photographs and site plans, the majority of aboveground storage tanks at SAEP were installed on concrete cradles or pads, and tanks were usually surrounded with a containment berm. It is not known if the bottom surface of the containment area was sealed and maintained to prevent leakage. A tank located near B-18 was noted to be resting on cradles with no containment berm in the 1970s; however, the tank is now contained by concrete dikes.

There are only 6 underground storage tanks (USTs) currently at SAEP; however, records indicate that 37 USTs have been removed or abandoned at SAEP since 1955 (see Table 4-4). Four of the existing USTs are the waste pits on the north side of B-13 where wastes containing oils, fuels, chlorinated oils, and emulsions are dumped. The other two USTs are located next to B-9 and provide fuel for on-site vehicles.

4.3.2 Storage Areas

Chemical storage areas at SAEP are shown in Figure 4-11. The primary chemical storeroom is located adjacent to B-15. This storage area has concrete floors and walls, and no drains. Chemicals in this area are segregated and stored by chemical type. Oils, solvents, and cleaners are stored inside B-15. B-15 is constructed with concrete floors, cinder block walls, and no drains.

Another chemical storage area is located next to the plating room in B-2. Chemicals in this storage area are segregated into three types: acids, cyanides, and alkalines. The acids occupy two storage bays, and the cyanides and alkalines occupy a third. The containers are situated on wood pallets on concrete floors.

Flammable materials are stored in B-8 on wood pallets or on metal shelves. Barrel racks in B-8 are surrounded by a concrete containment dike. The floor in this area is covered with absorbent material and no floor drains were observed in the building.

Batteries, oil, grease, and hydraulic fluid are stored in B-9, which is a maintenance shop area. The floors in this building are concrete, but there is a hydraulic lift pit and floor drains that lead into the OATP.

Machining oils and engine oils are stored in 55-gallon drums on metal racks on the east side of B-4. These oils are used in the engine testing and development areas.

4.3.3 Temporary Storage Areas

There are 19 known satellite accumulation areas in various locations at SAEP (see Table 4-5). Satellite accumulation areas serve as temporary storage areas for small quantities (one to six 55-gallon drums) of waste liquids and/or solids. Several of these satellite areas do not have containment systems, and storm drains were observed near some of them.

A temporary storage area for 55-gallon drums containing liquid or solid wastes, primarily from plating processes, is located between the tank farm and B-37 (see Figure 4-11). About 6 to 12 drums are normally stored in this area. This storage area serves as a staging area for drums that require testing of contents prior to disposal off site.

4.4 WASTE DISPOSAL PRACTICES

Little information regarding specific disposal practices at SAEP was found by this study for years prior to the 1960s. However, it may be assumed that disposal practices at SAEP were similar to industry standards at that time. Prior to the 1960s, there was little public awareness of problems caused by releasing chemicals to the environment. Wastes were commonly disposed of in a convenient location; for example, wastes were dumped in out-of-the-way areas behind buildings or on unused site grounds.

The primary types of waste generated at SAEP before the 1950s are believed to have been waste oils, fuels, solvents, and paints. Drains at SAEP were piped directly to outfalls to the Housatonic River before construction of OATP in 1976, so any materials dumped into drains discharged to the river. Also, the river received surface runoff which may have contacted wastes potentially disposed of on the site grounds. Several aerial photographs show distinct plumes from several of these outfalls into the river.

Since 1951, when the plant was taken over by the U.S. Air Force for the purpose of manufacturing engines, most of the wastes generated at SAEP have resulted from production operations at B-2 and B-10. Wastes have also been generated as a result of: engine and engine component testing at B-16 and B-19; research and development at B-3; raw materials testing at B-3, B-6, B-7, and B-58; and vehicle maintenance at B-9.

Quantities of waste generated at SAEP from 1985 to 1990 are listed by waste type in Table 4-6. The information in Table 4-6 was compiled by SAEP environmental staff based on manifests in their files. Generated waste is either treated on site or disposed of by a private contractor.

4.4.1 Areas of On-site Disposal or Release

The causeway was constructed in the 1930s using an unknown source of fill. Additional materials were deposited along the northern edge of the causeway during the 1950s and 1960s. All materials deposited in the causeway at that time is not known; however, some of the fill is reported to consist of asbestos containing materials, as well as construction debris. The causeway was also reportedly used as a training area for the plant's fire department. Fires were started and extinguished on the causeway.

The shoreline along the plant has been extended at several times. Shoreline filling was done in the early 1930s in the area around the entrance to the causeway. The shoreline was further extended both north and south of the causeway to provide land area for additional buildings in the 1940s. Based on aerial photographs, site plans, and historic photographs, about 8 acres of land was added in 1944 by hydraulic dredging of the Housatonic River.

A 1943 aerial photograph shows 4 outfalls from the plant discharging to the intertidal flats area, and several of the 1944 photographs show the pipelines being extended through the hydraulic fill area. Presently, there are 8 outfalls from the plant to the intertidal flats. Specific amounts or constituents of materials/wastes that may have been discharged from the outfalls in the past are not known; however, any material or waste dumped or spilled into storm drains prior to construction of OATP was potentially released to the intertidal flats through one of the outfalls. Three documented releases of hazardous materials to the intertidal flats were discovered during the present record search (see Section 5.4.1.3 for discussion). These releases involved chromic acid (1978), oil (1979) and "zyglo" dye (1981).

The shoreline area (i.e., area where hydraulic fill was placed) has been used to store raw stock such as castings (which were manufactured elsewhere), fuels and oil, scrap metals, and waste fuels, oils, and solvents. This area has also been used for testing engines and engine components since the early 1950s. Based on interview information and/or remedial measures already taken, the following shoreline areas have potential contamination caused by past disposal or releases:

B-19

- A dry well, located inside B-19, was used for disposal of waste fuels, oils, and solvents. Although the dry well is not currently used, no records were found to indicate that it has been investigated or removed.

- A drum storage area, located east of B-19, formerly had a drainage system comprised of a grate underlain by a gravel trench. Contaminated soils have recently been excavated from this area.

- Fuel storage tanks in this area were occasionally overfilled.

B-5 and B-16

- Fuel storage tanks in the area of B-5 and B-16 have apparently leaked, based on a recent study that discovered petroleum contamination in this area (Metcalf and Eddy, 1990).

- An area north of B-16 was formerly used as a scrap metal yard. Scrap metals were reportedly covered with oils and greases that were eventually released to the ground.

- Manometers formerly used for pressure measurements would occasionally release mercury to test cells, and some mercury was potentially washed down the drains.

- Solvents used for engine cleaning were used in large amounts, and at one time waste solvents/oils/fuels were dumped into drains. Waste solvents have been also been contained in drums or carts which were collected on small docks located on the east side of B-16; some spills have reportedly occurred in this area.

B-13, B-15, B-58, and Tank Farm

- This area of the site has been used for oil blending, waste reclamation, and waste storage since the 1940s. Although no major releases or spills in this area have been reported or documented, numerous small spills have reportedly occurred and there is potential of leakage from drain lines and pits.

- Oil was reportedly observed in the ground during pile driving for construction of B-58.

- Minor overfills of tanks at the tank farm have reportedly occurred in the past.

B-65

- Evidence of former on-site paint disposal was recently encountered during excavations for B-65. Paint-contaminated soils were discovered and subsequently excavated to the low tide water level. It is believed that the source of the paint contamination may have been zinc-chromate undercoat used to paint the Corsair in the 1940s.

- Petroleum-contaminated soils were also discovered during the B-65 excavation. They were removed and are presently stockpiled south of the south parking lot in a contained area.

The plant formerly had an incinerator. According to interview information, ash and cinders have been encountered during foundation excavations under the north end of

B-2. It is not known if other wastes were deposited in this area before B-2 was extended northward in the early 1940s.

According to interview information, water pumped as part of dewatering operations for a foundation at B-10 (late 1970s) and for construction of the cyanide destruction facility (mid 1980s) turned "greenish-blue". These excavations are both located in the vicinity of the plating shop at B-2 and the former plating shop at B-3, and it is believed that the color change indicates a source of chromium contamination in this vicinity.

Evidence of petroleum contamination was discovered during the sludge lagoon excavation in 1988. Stained soils (apparently caused by petroleum) were reportedly observed in the excavation near B-72, but no action was taken at that time to remove these contaminated soils.

Treated effluent from CWTP has been discharged to a drainage ditch south of the site since it went into operation in 1958. CWTP formerly included sludge and equalization lagoons, which were recently closed under RCRA Subtitle C and are no longer operational. Currently, a groundwater monitoring program for this area is in its seventh year, and various contaminants have been found in the groundwater including chlorinated hydrocarbons (see Sections 4.4.4.1 and 4.4.3 for discussion of CWTP and lagoons, respectively).

4.4.2 Industrial Wastewater

Industrial activities at SAEP result in the generation of wastewater that is contaminated with heavy metals, cyanide, caustics, acids, oils, greases, fuels, and solvents. These industrial wastewaters are currently separated into three waste streams for on-site treatment prior to discharge. On-site wastewater treatment facilities (see Figure 4-11) include:

- The chemical waste treatment plant (B-18), constructed in 1958 and upgraded in 1986

- The cyanide destruction facility (B-70), constructed in 1986

- The oil abatement treatment plant (B-64), constructed in 1976 and currently under redesign.

SAEP is authorized to discharge from 8 outfalls (see Figure 4-10) under NPDES Permit No. CT0002984 (see Section 5.4 for discussion of discharge permits). One of the outfalls (OF-007) discharges wastewater treated at OATP to the Housatonic River; another outfall (OF-008) discharges wastewater treated at CWTP to a drainage ditch that flows to the Marine Basin south of the plant; the other 6 outfalls (OF-001 through OF-006) discharge intermittently to the Housatonic River when heavy runoff enters the plant's storm water drainage system.

4.4.2.1 Chemical Waste Treatment Plant (CWTP) and Cyanide Destruction Facility (CDF)

From 1951 (when plating operations began at SAEP) to 1958, wastewater from plating and related operations was neutralized within its process tank and then discharged to the storm water system for disposal (ESE, 1981). At that time, storm water drained directly to the Housatonic River. CWTP began operating in May 1958 to handle wastewaters generated by electroplating and other corrosion resistance operations.

As part of its original design, CWTP had a bentonite-lined equalization lagoon, which has been closed under RCRA Subtitle C. Treatment processes at CWTP originally involved: alkaline chlorination for cyanide oxidation; hexavalent chromium reduction; and coagulation and sedimentation of metal hydroxide precipitates. Sludges generated by the treatment processes were disposed of in one of three on-site, unlined lagoons. These lagoons were also closed under RCRA Subtitle C.

In the 1980s, various problems associated with operations at CWTP were recognized, such as: the disposal of waste sludge in lagoons, discharges above permitted pH limits, and potentially unsafe mixing of wastestreams that could result in generation of hydrogen cyanide gas (Weston, 1982). To address these issues, the plant and piping were upgraded to segregate wastestreams, add a separate cyanide destruction facility, add equalization tanks, renovate existing tanks and clarifier, and add a sludge dewatering facility.

Currently, cyanide-contaminated wastewater is separated from other industrial wastewater. Cyanide wastewater is piped to CDF, where it is treated by alkali chlorination and converted to nitrogen and bicarbonate. Effluent from this process is combined with other wastewaters and pumped to equalization tanks at CWTP. Treatment at CWTP involves chromium reduction, precipitation of chromium and other heavy metals, and clarification. Effluent from the clarifier passes through sand filters before final discharge at outfall OF-008. Sludges from the clarifier are dewatered by a sludge thickener and filter press. The filter cake is disposed of off site, and the filtrate is returned to CWTP for further treatment.

4.4.2.2 Oil Abatement Treatment Plant (OATP)

OATP began operations in 1976 to remove oil and grease from wastewater in the plant's storm drainage system prior to discharge to the Housatonic River. OATP operates continuously with an average flow of 1.8 million gallons per day, and a maximum design flow of about 4,200 gallons per minute (INEL, 1991).

The plant drainage system is currently equipped to convey dry weather flow, including the first flush of stormwater, to OATP for treatment; however, some runoff (the amount is dependent on the storm event size) is discharged directly to the Housatonic River. Wastewater is delivered to OATP by six pump stations. Pump stations B-36, B-37, and B-38 serve the northern half of SAEP, and pump stations B-41, B-40, and B-64 serve the southern half. Each half of the plant is served by its own transmission main to convey water to OATP (Genovese and Associates, 1990).

Influent to OATP enters a surge tank for flow equalization. Treatment processes involve: coagulation and flocculation by addition of liquid alum in a flash mixer; and dissolved air flotation and skimming in a flotation chamber. Effluent from OATP is discharged to the Housatonic River through outfall OF-007.

OATP is presently being redesigned to bring it into compliance with new toxicity performance standards. Several problems were noted during the design investigation, including: the continuous or intermittent presence of oil, copper, TCA, and ammonia discharge to the waste stream; and inadequate pump capacities at B-36, B-37, B-40, and B-41 to prevent localized flooding and resulting direct discharge to the Housatonic River caused by a two-year return frequency storm event (Genovese and Associates, 1990).

4.4.3 Sanitary Wastewater

Sanitary wastewater generated at SAEP is conveyed to the Town of Stratford's treatment plant. Sanitary sewers from plant buildings connect into a main discharge line which runs across the site and connects into a pump station owned and maintained by the Town of Stratford located in the north parking lot (see Figure 4-12). The Town of Stratford has an easement across SAEP for their sewer line and pump station. The easement was granted in early 1982, and it consists of about 1,250 linear feet and 0.22 acres of land at SAEP.

The Town of Stratford's treatment system consists of activated sludge secondary treatment, and effluent is discharged into the Housatonic River. The discharge outfall is located about 1/2 mile upstream of SAEP. There are no known problems resulting from SAEP's sanitary sewerage discharge.

4.4.4 Solid Waste

Solid wastes generated at SAEP include sludges from treatment at CWTP and OATP, scrap metal and wood, waste paper, and small amounts of waste food scraps and medical waste.

At present, scrap wood, waste paper, food scraps, and wastes from the on-site medical dispensary are collected for disposal or reclamation by private contractors. Marketable scrap metals are sold to salvage contractors. Based on interviews and site plans, SAEP had incinerators at two locations for the purpose of burning solid wastes generated on site. Reportedly, ash and cinders from incineration have been disposed of on site.

Waste sludges generated by CWTP were formerly stored in three unlined sludge lagoons. From 1957 to 1968, about 7,000 gallons of sludge removed biannually by a private contractor and disposed of at the Town of Stratford's landfill. This practice ceased in 1968 when the landfill refused to accept sludge. In 1981, a USACE project removed approximately 10,000 cubic yards of sludge for disposal in Bridgeport's Seaside Park landfill (ESE, 1981). These lagoons were closed in 1990. As part of the closure, sludges and contaminated soils were excavated to the low tide level and disposed of off site. Currently, waste sludges generated by CWTP are hauled to Canada for recycling.

Waste sludges generated by OATP are stored on site in the oil-alum tank near B-13. A private contractor periodically removes these wastes and takes them off site for incineration.

4.5 CONTAMINATED STRUCTURES, BUILDINGS, AND FIXTURES

4.5.1 Asbestos

Asbestos was a common building material with widespread use from the 1920s to the mid 1970s. Generally, asbestos is only hazardous when it is friable, i.e., in a state from which fibers may become airborne such as when an asbestos containing material (ACM) has been damaged or disturbed. Current federal law (Asbestos Hazard Emergency Response Act of 1986 (AHERA)) requires the removal of ACM from schools, but there are currently no requirements for removal of ACMs from other buildings unless it becomes exposed and can be released to the air. However, AHERA may be expanded in the future to cover all public and commercial buildings.

Since the mid 1970s, SAEP has implemented a policy to not use ACMs for any new construction or renovation. Since that time, asbestos surveys have reportedly been completed prior to any plant construction. When asbestos is identified, it is removed by a licensed contractor and disposed of properly in a licensed landfill.

Based on interviews of SAEP personnel, as well as review of some building plans and specifications and limited site reconnaissance, the potential sources of asbestos in on site structures is primarily in pipe wrap insulation, transite wallboard, and floor tile. The potential for ACM in SAEP buildings is provided in the listing of Table 4-7. The actual presence or absence of ACM needs to be confirmed by a detailed survey that includes visual inspection and sampling.

4.5.2 PCBs

Polychlorinated biphenyls (PCBs) are regulated under the Toxic Substances Control Act (TSCA), which regulates the containment, removal, and disposal of PCBs. PCBs are highly toxic, considered to be carcinogenic, tend to bioaccumulate in animal and human tissue, and resist degradation. EPA regulations provide specific policies regarding registration, inspection, reporting, and cleanup of transformers or other equipment that contain PCBs.

There are currently 21 transformers at SAEP that contain PCBs (see Table 4-8). Two of the transformers are "PCB-contaminated transformers" (i.e., PCB concentration greater than 50 ppm but less than 500 ppm), and 19 of the transformers are "PCB-transformers" (i.e., PCB concentration greater than 500 ppm). Two PCB spills are noted in a former environmental site assessment report (ESE, 1981). This report does not contain information regarding dates, locations, and quantities of each spill; therefore, the quantities spilled or spill locations have not been determined by this study. Drip pans have been placed beneath each transformer, and all but one transformer is contained by a concrete curb or vault. Substation 43 at B-3 is the only transformer that is not contained within a bermed area.

All of the transformers are now inspected quarterly by SAEP personnel; they were formerly inspected by General Electric personnel (AMC, 1981); however, a compliance order regarding inspection lapses was found during the records search of SAEP's files (see Section 9.6).

SAEP will phase out PCB and PCB-containing transformers through facility upgrade projects and/or as required by regulatory agencies.

4.5.3 Lead

Based on a review of specifications, some of the paints used to paint buildings on site between the 1930s and 1970s contained lead. The areal extent of possible lead-contaminated paints on site has not been determined.

4.5.4 Radon

Based on interview information, a radon survey of SAEP was completed by the environmental department in the mid 1980s. Since no radon was detected, it is not considered to be an existing contaminant at SAEP.

4.6 PESTICIDES, RODENTICIDES, AND HERBICIDES

Pesticides and rodenticides have been used at SAEP to control pest-related structural problems and prevent health problems. All pest control services are currently contracted to State of Connecticut certified applicators. Based on interview information, pest control was accomplished by SAEP maintenance crews in the past; however, no evidence of widespread pesticide or rodenticide use or storage has been discovered by this study.

Currently, pesticides or rodenticides are not stored or mixed at SAEP. As needed, they are transported premixed to the site by a licensed contractor. No containers, excess product, or rinse waters from pesticides or rodenticides are known to have been disposed of on site, based on interview information and other reports (ESE, 1981).

Small quantities of herbicides were formerly stored in B-13. Herbicides were mixed outside, generally on paved areas, without containment. No wastes were reportedly generated because all the mixed product was used at the time of application. Currently, herbicides are applied as needed by a licensed contractor (AMC, 1987).

4.7 NOISE

The testing of turbine engines at B-16 is a source of noise at SAEP. Engine tests may be 5 minutes to 1,000 hours in duration, and thus involve nighttime operations. SAEP has, in the past, emitted noise in excess of U.S. Army environmental guidelines. The plant noise emissions have been brought into compliance with these guidelines by curtailing operations of the test cells with deteriorated silencing equipment and refurbishing deteriorated silencers.

Mathematical models were used to simulate the noise environment in the vicinity of SAEP in 1985 (Avco and SAEP, 1985). These models are used to develop noise zone maps and to divide the areas surrounding the facility into zones according to the following definitions:

- Zone I is the area where the day-night sound level (Ldn) is less than 70 decibals (dBA).

- Zone II is the area where the Ldn exceeds 70 dBA but is less than 75 dBA.

- Zone III is the area where the Ldn exceeds 75 dBA.

The Noise Zone Maps with installation compatible use zone (ICUZ) contours were prepared for SAEP and are contained in the ICUZ Study Report (Avco and USDA, 1985). A map showing the ICUZ noise contours is shown in Figure 4-13.

4.8 EXPLOSIVES/ORDNANCE

Explosives were stored in B-59 during the late 1960s and 1970s for use in the manufacturing of reentry vehicles for the Titan and Minuteman ICBM systems. The explosives used at SAEP were reportedly for explosive bolts or explosive materials used in the guidance systems of the ICBMs. These explosives were packed inside cylindrical containers. Because some records are classified and others were not found by this study, the type and quantity of explosives used and stored at SAEP is not known.

No unexploded ordnance was reported or observed at SAEP.

4.9 RADIOLOGICAL MATERIALS

The only radiological materials handled at SAEP are magnesium- and nickel-thorium (thorium) alloys (2 percent thorium). These alloys, used as part of the turbine engine intake structures, are handled under U.S. Nuclear Regulatory Commission (NRC) License Number STB-393. The maximum licensed amount of thorium alloy which can be stored on site at a given time is 2,300 kg.

The thorium alloy is machined at SAEP as part of the engine production and requires special handling. The SAEP Safety Office ensures compliance with the conditions of the NRC license and Textron Lycoming's Standard Operating Procedures (SOP). Readings reportedly average 0.001 millirem per hour (mrem/hr). This radiation level is well below the 5-mrem/hr level allowable for occupational exposure (ESE, 1981).

All machine turnings of the alloy and machining fluids are recovered and recycled by an NRC-licensed contractor. Radiological inspections of the installation are conducted by the NRC every 3 years by the U.S. Department of Defense (DOD) and on an unannounced, random basis.

TABLE 4-1
SUMMRY OF BUILDING CONSTRUCTION AT SAEP

Building Number	Use	Construction Date[1]	Demolition Date
1929-1939			
B-1	Administration	1929 (1943, 1965)	
B-2	Manufacturing	1929 (1942-1944)	
B-10	Service/Recuperator Manufacturing	1929 (1981, 1989)	
B-3	Engineering and Development	1930 (1943-1944)	
B-8	Paints, Solvents Storage	1939 (1981)	
1940-1943			
B-11/10	General Stores/Recuperator Manufacturing	1940 (1985)	
B-12	Tool and Maintenance	1941	
B-7	Engine Fuel System Test	1942	
B-9	Garage	1942	
B-3A	Engineering Laboratory	1943 (1980)	
1944-1949			
B-3T	Cafeteria	1944	1976
B-5	Fire Headquarters/Components Test Facility	1944	
B-6	Experimental Hanger/R & D	1944 (1990)	
B-13	Scrap Metal & Reclamation	1944	
B-14	Incinerator	1944	
B-19	Component Test Facility	1944 (1988)	1970
B-19A/19	Vacuum System/Testway 7	1944 (1988)	
B-19B/19	Control Room For Testways 19-7, 8,9,10,12 & B56 1,2	1944 (1988)	
B-19C/19	Testways 8 & 9	1944 (1988)	
B-19E/19	Fuel Room	1944 (1988)	
B-42	Sprinkler Pump Station	1944	
B-43	Pump Station	1944	
B-50	Transformer House	1944	
B-64	Storage Building	1944	1972
B-4	Recuperator Repair Facility and S.S.E. Mfg.- Machine and Equipment Storage	1945	1970
B-15	Oil, Lubrication, Acid, and Alkali Storage	1945 (1981)	
1950-1960			
B-17	Steam Generating Plant	1952	
B-16	Production and Development Test Cells	1953	
B-33	Cooling Tower Pump Station	1953	
B-34	Fuel Pumping Station	1953	
B-35	Storm Drain Pumping Station	1953	1980

TABLE 4-1 (Continued)
SUMMARY OF BUILDING CONSTRUCTION AT SAEP

Building Number	Use	Construction Date[1]	Demolition Date
1950-1960 (Con't)			
B-36	Storm Drain Pumping Station	1953	
B-37	Storm Drain Pumping Station	1953	
B-38	Storm Drain Pumping Station	1953	
B-39	Storm Drain Pumping Station	1953	1971
B-40	Storm Drain Pumping Station	1953	
B-41	Storm Drain Pumping Station	1953	
B-18	Chemical Waste Treatment Plant (CWTP)	1958	
B-51/19	V404 Compressor Exhauster	1958 (1988)	
B-63	CWTP Pumping Station	1958	
1961-1970			
B-44	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	
B-45	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	1980
B-46	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	1980
B-47	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	1980
B-48	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	
B-49	Quonset Hut - Stores, Tooling, and Equipment Warehousing	1961	1968
B-53	Surplus Equipment Storage	1961	
B-7A	Engine Fuel System Test	1962	
B-52	Plasma Spray Facility and Production Material Warehousing	1962 (1981)	
B-19F/19	Hi-Temp, Rig Testways 10 & 12	1963 (1988)	
B-54	Production Material Warehousing	1963	1990
B-55	Production Material Warehousing	1963	1990
B-57/19	Transformer Room	1964 (1988)	
B-56/19	Tri-Engine Drive Testways 56-1 & 2	1965 (1988)	
B-6A	Engine Mechanical Component Test	1966	
B-58	Missile Assembly/Standards Laboratory	1967	
B-59	Missile Storage Magazine	1968	
B-60	High-Pressure Natural Gas Pumping Station	1968	
B-61	Refrigeration Plant	1969	

TABLE 4-1 (Continued)
SUMMARY OF BUILDING CONSTRUCTION AT SAEP

Building Number	Use	Construction Date[1]	Demolition Date
1971-1980			
B-62/19	Joy Compresor, I.R. & V306 Compressor	1971 (1988)	
B-64-1	Oil Abatement Treatment Plant Pump House	1975	
B-64-2	Oil Abatement Treatment Pump (OATP)	1975	
B-77	IREP/ISD Office	1978	
B-79	SSE Office	1979	
1981-1991			
B-67	General Stores	1985	
B-69	Resident Engineer	1985	
B-68	Emergency Generator	1986	
B-70	Cyanide Destruction Facility (CDF)	1987	
B-71	CWTP Solids Handling	1987	
B-73	Hazardous Waste Storage Area	1987	
B-74	Hazardous Waste Storage Area	1987	
B-75	Hazardous Waste Storage Area	1987	
B-76	Hazardous Waste Storage Area	1987	
B-72	Fuel Pumping Station	1989	
B-78	Guard House and Scale	1989	
B-65	Storage Facility (under construction)	1991	

1 Dates in parentheses indicate construction of major additions to a building

TABLE 4-2
SUMMARY OF RAW MATERIALS AND WASTE AT SAEP

Process	Chemical Type	Use	Entrance to SAEP Waste Stream	Waste Code(1)	Fate Code(2)
Machining	Water soluble oil	Cutting oil/coolant	Vacuum cart to recyling unit	CR03	R, T
Machining	Dye	Penetrant	Formerly to OATP Currently recyled on site through GAC	None M099	T D
Machining	Hydraulic fluid	Transfer energy	Container to waste oil tank	CR02	B
Machining	Oil	Lubricant	Container to waste oil tank	CR02	B
ECM	Brine	Electrolyte	Formerly to OATP; Process not used since 1987	None	T
Electro-plating	Hydroxides, Rochelle salts, copper cyanide, and sodium cyanide	Copper plating bath	Wastewater to cyanide destruction, then to CWTP	None	T
Electro-plating	Chromic and sulfuric acids	Chrome plating bath	Wastewater to CWTP	None	T
Electro-plating	Nickel sulfamate	Nickel plating bath	Wastewater to CWTP	None	T
Electro-plating	Nickel chloride and hydrochloric acid	Nickel striking bath	Wastewater to CWTP	None	T
Electro-plating	Cadmium cyanide	Cadmium plating bath	Wastewater to CWTP Process no longer used	None	T
Corrosion Resistance	Chromic acid	Anodize or chemically coat aluminum	Wastewater to CWTP	None	T

TABLE 4-2
SUMMARY OF RAW MATERIALS AND WASTE AT SAEP (Continued)

Process	Chemical Type	Use	Entrance to SAEP Waste Stream	Waste Code[1]	Fate Code[2]
Corrosion Resistance	Sodium dichromate and magnesium fluoride	Dichromate finish on magnesium	Wastewater to CWTP	None	T
Corrosion Resistance	Proprietary	HAE anodic finish on magnesium	Wastewater to CWTP	None	T
Corrosion Resistance	Sodium hydroxide and sodium nitrate	Black oxidation	Wastewater to CWTP	None	T
Corrosion Resistance	Phosphoric acid and zinc or magnesium phosphate	Phosphate finish	Wastewater to CWTP	None	T
Cleaning	Nitric acid	Passivation of hardened steel	Wastewater to CWTP	None	T
Cleaning	Epoxides, enamels, silicones, thinners, zinc chromate primers	Painting	Container to hazardous waste storage	D001	I/B
Cleaning	Oil	Oil slush	Vacuum cart to waste oil tank	CR02	I/B
Cleaning	Aluminum and magnesium	Plasma spray	Overspray to container to solid waste	None	D
Cleaning	Chlorinated solvent	Vapor degreasing Spray and wipe degreasing	Vacuum cart to degreasing solvent tank	F001	G/D
Cleaning	Solvent	Paint removal	Container to hazardous waste storage	F003	I/B
Cleaning	Solvent	Touch and wipe cleaning	Container to hazardous waste storage	F005	I/B

TABLE 4-2
SUMMARY OF RAW MATERIALS AND WASTE AT SAEP (Continued)

Process	Chemical Type	Use	Entrance to SAEP Waste Stream	Waste Code(1)	Fate Code(2)
Cleaning	Freon	Flux removal and touch-up cleaning	None	None	None
Cleaning	Detergents	Emulsion cleaning of soils/grease/oil	Vacuum cart to waste oil tank for oil/water separation:		
			• Wastewater to OATP	None	T
			• Oil to waste oil storage	CR02	B
Cleaning	Potassium or sodium hydroxide	Alkaline degreasing	Wastewater to CWTP	None	T
Cleaning	Sodium hydroxide	Anodic cleaning	Wastewater to CWTP	None	T
Cleaning	Hydroxides and sodium cyanide	Periodic reverse cleaning	Wastewater to cyanide destruction, then to CWTP	None	T
Cleaning	Hydrofluoric acid, hydrochloric acid, nitric acid, chromic acid, sulfuric acid	Acid cleaning and pickling	Wastewater to CWTP	None	T
Cleaning	Hydrochloric acid, nitric acid, and hydrated ferric chloride	Etching	Wastewater to CWTP	None	T
Cleaning	Sulfuric acid and hydrofluoric acid	Etching	Wastewater to CWTP	None	T
Cleaning	Grit and glass beads	Abrasive blasting	Container to nonhazardous solid waste	None	D
Cleaning	Abrasives	Abrasive slurry	Container to nonhazardous solid waste	None	D

TABLE 4-2

SUMMARY OF RAW MATERIALS AND WASTE AT SAEP (Continued)

Process	Chemical Type	Use	Entrance to SAEP Waste Stream	Waste Code[(1)]	Fate Code[(2)]
Miscellaneous Other	Organic compounds	Electrofilming	Container to hazardous waste storage	D001	I
Miscellaneous Other	Wax, lacquer, plastic	Masking	Container to hazardous waste storage	None	D
Miscellaneous Other	Glass beads	Peening	Container to hazardous waste storage	None	D
Miscellaneous Other	None	Heat treatment	None	None	None

(1) CR02 - Waste oil.
CR03 - Water soluble waste oil.
M099 - Massachusetts regulated.
F001 - Spent halogenated degreasing solvents. Federally regulated. 40CFR261.31.
F003 - Spent nonhalogenated solvents. Federally regulated. 40CFR261.31.
F005 - Spent nonhalogenated solvents. Federally regulated. 40CFR261.31.
D001 - Ignitable waste. Federally regulated. 40CFR261.21.

(2) R Recycled/reclaimed and put back into the original process or a different. The rendering/reclaiming is performed external to the generating industrial process but on/by the installation. In-process recycling as defined by EPA should not be included as in-process recycling directly reduces source generations since the recycled wastestream never leaves the process. Example: degreasing solvents distilled and reused back in the degreasing operation. Note: any distilling bottom sludges must be reported as HW generation.

G Recycled/reclaimed/sold to an off-post contractor or organization, not through DRMO, and a like product not returned to the installation. Example: redwater given/sold to a paper mill directly by the installation.

T Treated at an industrial treatment plant or pretreatment plant where the treatment-resultant wastestream is discharged to the environment via NPDES permit or to the sanitary sewer system. A HW product may also be produced as part of the treatment process.

I Incinerated or thermally treated. Example: OB/OD, thermally-treated granular activated carbon for pinkwater and treated activated carbon disposed (if activated carbon is reused than use a fate code "R" or "O").

B Burned as a fuel supplement. A form of reuse but indicated as a separate category. Example: used oil and/or solvent used as fuel supplement.

D Disposal. Ultimate disposal off site not through DRMO

TABLE 4-3
SUMMARY OF STORAGE TANKS AT SAEP

General Location	Tank No.	Tank Type(1)	Year Installed(2)	Volume (gallons)	Tank Content
Tank Farm	H101M	A	1980-1982	10,000	TCA-New
	H102M	A	1980-1982	10,000	33-18
	H103W	A	1980-1982	10,000	31-30
	H104W	A	1980-1982	10,000	Empty
	H055M	A	1980-1982	5,000	TCA-For Recycle
	H056M	A	1980-1982	5,000	TCA-Recycled
	H057W	A	1980-1982	5,000	Waste Oil-Chlorinated
	H058W	A	1980-1982	5,000	31-32-Dirty
	H059W	A	1980-1982	5,000	Waste Fuel
	H1010M	A	1980-1982	10,000	Varsol
	H1011W	A	1980-1982	10,000	Coolant
	H1012W	A	1980-1982	10,000	Waste Oil
	H1013W	A	1980-1982	10,000	Waste Oil
B-9		U	1989	3,000	Gasoline-unleaded
		U	1989	3,000	Gasoline-unleaded
B-10	C802A	A	1947-1952	80,000	Fuel Oil #6
B-12	G034M	A	1953-1966	3,000	Ammonia
B-13	C107F	A	1953-1966	10,000	Oil-Alum
		U	Unknown	500	Waste Oil
		U	Unknown	500	Waste Fuel
		U	Unknown	400	Waste Oil
		U	Unknown	400	Waste Oil
B-16	C401G	A	1980-1984	40,000	Diesel #2
	C402G	A	1980-1984	40,000	Diesel #2
B-18	W3	A	1980-1988	20,000	Water-Plating
	W4	A	1980-1988	20,000	Water-Plating
	W5	A	1980-1988	20,000	Water-Plating
	W6	A	1980-1988	30,000	Water-Plating
	C0111G	A	1989	1,000	Fuel Oil #6
	H3014M	A	1953-1960	5,000	Sulfuric Acid
B-19	C029G	A	1953	2,000	Diesel #2
	C018G	A	1953	1,000	Diesel #2
	C0110G	A	1953	1,000	JP-5
	F601G	A	1986	60,000	JP-4
	C602G	A	1986	60,000	Jet-A

TABLE 4-3
SUMMARY OF STORAGE TANKS AT SAEP (Continued)

General Location	Tank No.	Tank Type[(1)]	Year Installed[(2)]	Volume (gallons)	Tank Content
B-34	F204M	A	1989	20,000	JP-4
	C2012M	A	1989	20,000	Diesel #2
	C2013M	A	1989	20,000	Jet-A
	F205M	A	1989	20,000	JP-4
	C2014M	A	1989	20,000	JP-5
	C2015M	A	1989	20,000	Jet-A
	C316M	A	1989	3,000	Empty
B-36	G101M	A	1980-1984	10,000	Argon
	F013M	A	1980-1984	750x22[(3)]	Hydrogen
B-43	W1	A	1938-1939	400,000	Water-Fire
B-44	F503M	A	1979-1984	5,000	Methanol
	G182M	A	1979-1984	18,000	Nitrogen
B-44/48	C4001A	A	1979-1984	400,000	Fuel Oil #6
B-64	W2	A	1973	200,000	Water-Storm
B-64-2	H1016M	A	1973	10,000	Alum Sulfate
B-70	T051W	A	1979-1984	5,000	Cyanide
	T052W	A	1979-1984	5,000	Cyanide
	H0516M	A	1979-1984	500	Sulfuric Acid
	H0517M	A	1979-1984	500	Sodium Hydroxide
	H0518M	A	1979-1984	500	Sodium Hypochlorite
	G103M	A	1979-1984	10,000	Argon
	H0515M	A	1979-1984	500	Sulfuric Acid
	H0519M	A	1979-1984	500	Sodium Hydroxide
B-72	C201G	A	1965-1966	20,000	Diesel #2
	F202G	A	1965-1966	20,000	JP-4
	C203G	A	1980-1986	20,000	Diesel #2
	C204J	A	1980-1986	20,000	Jet-A
	C101G	A	1980-1986	10,000	Diesel #2
	C102J	A	1980-1986	10,000	Diesel #1

(1) A = Aboveground tank
U = Underground tank

(2) Range given based on photo interpretation if records do not indicate year.

(3) Twenty-two $750m^3$ tanks.

TABLE 4-4
LIST OF INACTIVE UNDERGROUND STORAGE TANKS AT SAEP

Location	Volume (gallons)	Contents	Remark	Date Abandoned	Date Removed
B-2	1,500	Sanitary	Sand Filled	04-01-69	
B-2	2,500	Oil	Under Building	10-01-55	
B-2	2,500	Oil	Under Building	10-01-55	
B-4	20,000	Brine	Stopped Use 10-87		03-25-89
B-6	550	Fuel	Abandoned		04-17-89
B-6	550	Fuel	Abandoned		04-17-89
B-6	5,000	Oil	Sand Filled	05-01-79	
B-6	5,000	Fuel	Sand Filled	05-01-79	
B-9	2,500	Gas Leaded	Stop Use 08-12-89		09-01-89
B-9	2,500	Gas Unleaded	Stop Use 08-12-89		09-01-89
B-9	3,000	Gasoline	Monitor		09-30-89
B-9	3,000	Gasoline	Monitor		09-30-89
B-18	1,000	Oil #2	Oil Burner Supply		09-01-89
B-19	550	Fuel	Abandoned		08-28-87
B-19	550	Fuel	Abandoned		08-28-87
B-19	1,000	Fuel	Abandoned		08-28-87
B-19	2,000	Fuel	Abandoned		08-28-87
B-34	20,000	JP-4	Stop Use 08-10-89		09-01-89
B-34	20,000	JP-4	Stop Use 08-10-89		09-01-89
B-34	20,000	Jet-A	Stop Use 08-10-89		09-01-89
B-34	20,000	JP-5	None		09-01-89
B-34	20,000	Jet-A	None		09-01-89
B-34	20,000	Diesel	Stop Use 08-10-89		09-01-89
B-34	4,000	Fuel 1% S	Stop Use 08-10-89		09-01-89
B-34	5,000	Varsol	Stop Use 08-10-89		09-01-89
B-34	1,000	Fuel	Abandoned		09-01-89
B-34	5,000	Empty	Abandoned		09-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-34	300	Fuel	Abandoned		04-01-89
B-52	1,000	Oil	Sand Filled	04-01-69	

TABLE 4-5
LIST OF SATELLITE ACCUMULATION AREAS AT SAEP

Satellite Area Number	Location	Material
1	B-58	TCA
1	B-58	Jet Fuel
2	B-12	Filters
3	B-48	Paint Cans
3	B-48	Waste Paint
4	B-16(North)	Waste Oil
4	B-16(North)	Jet Fuel
5	B-16	Waste Oil
5	B-16	Jet Fuel
5	B-16	Filters
5	B-16	Oil/Rags
6	B-7	Waste Oil
7	B-16(South)	Jet Fuel
7	B-16(South)	Waste Oil
8	B-3A	Solvents
8	B-3A	TCA
8	B-3A	Jet Fuel
8	B-3A	Waste Oil
8	B-3A	Acid Waste
9	B-34	Filters
9	B-34	Jet Fuel
10	B-6	Calib Fluid
10	B-6	Not Listed
11	B-6	Jet Fuel
11	B-6	Waste Oil
12	B-6A	Waste Oil
12	B-6A	Waste TPC
13	B-6	Waste Oil
13	B-6	Waste TPC
14	B-5	Jet Fuel
14	B-5	Not Listed
14	B-5	Not Listed
15	B-2	Oil/Rags
16	B-2	Waste Oil
17	B-19	Filters
18	B-15	Waste Oil
19	B-2	Waste Oil

TABLE 4-6

WASTES GENERATED AT SAEP FROM 1985 TO 1990

Waste Stream Description	Waste Type[1]	Waste Quantity, in Kilograms[2] 1985 (Baseline)	1986	1987	1988	1989	1990
Electroplating Rinsewater	None	$2.2x10^8$	$2.2x10^8$	$2.2x10^8$	$2.2x10^8$	$2.2x10^8$	$2.18x10^8$
Electroplating Bath Solids	F006	12,450	6,645	6,290	6,049	425	12,795
CWTP Sludge	F006	$18.2x10^4$	$18.2x10^4$	$18.2x10^4$	$18.2x10^4$	$13.3x10^4$	$7.29x10^4$
Chlorinated Degreasing Solvents	F001	66,175	59,940	86,943	64,225	46,170	54,866
Paint Solvents	D001 F003 F005	2,700	8,375	4,611	5,209	4,710	4,376
Flammables (Aviation Fuel)	D001	8,790	8,809	51,685	55,540	62,277	39,655
Waste Oil	CR02	323,814	212,136	236,814	224,191	259,358	247,300
Coolant	CR03	6,709	47,336	143,363	45,845	202,825	1,009,927
Electroplating Bath Solids	F006	12,450	6,645	6,290	6,049	425	12,795
Oil-Alum Sludge	CR02	250,500	243,636	76,409	125,572	72,252	67,159
ECM Sludge	F006	50,000	Not Known	Not Known	0	0	0
Activated Charcoal	M099	0	0	0	0	0	2,100

(1) See Table 4-2 footnote(1) for identification of waste type.
(2) Information compiled by SAEPs Environmental Department
1 Kilogram = 2.2046 lbs

TABLE 4-7
POTENTIAL FOR ASBESTOS CONTAINING MATERIALS IN BUILDINGS AT SAEP[1]

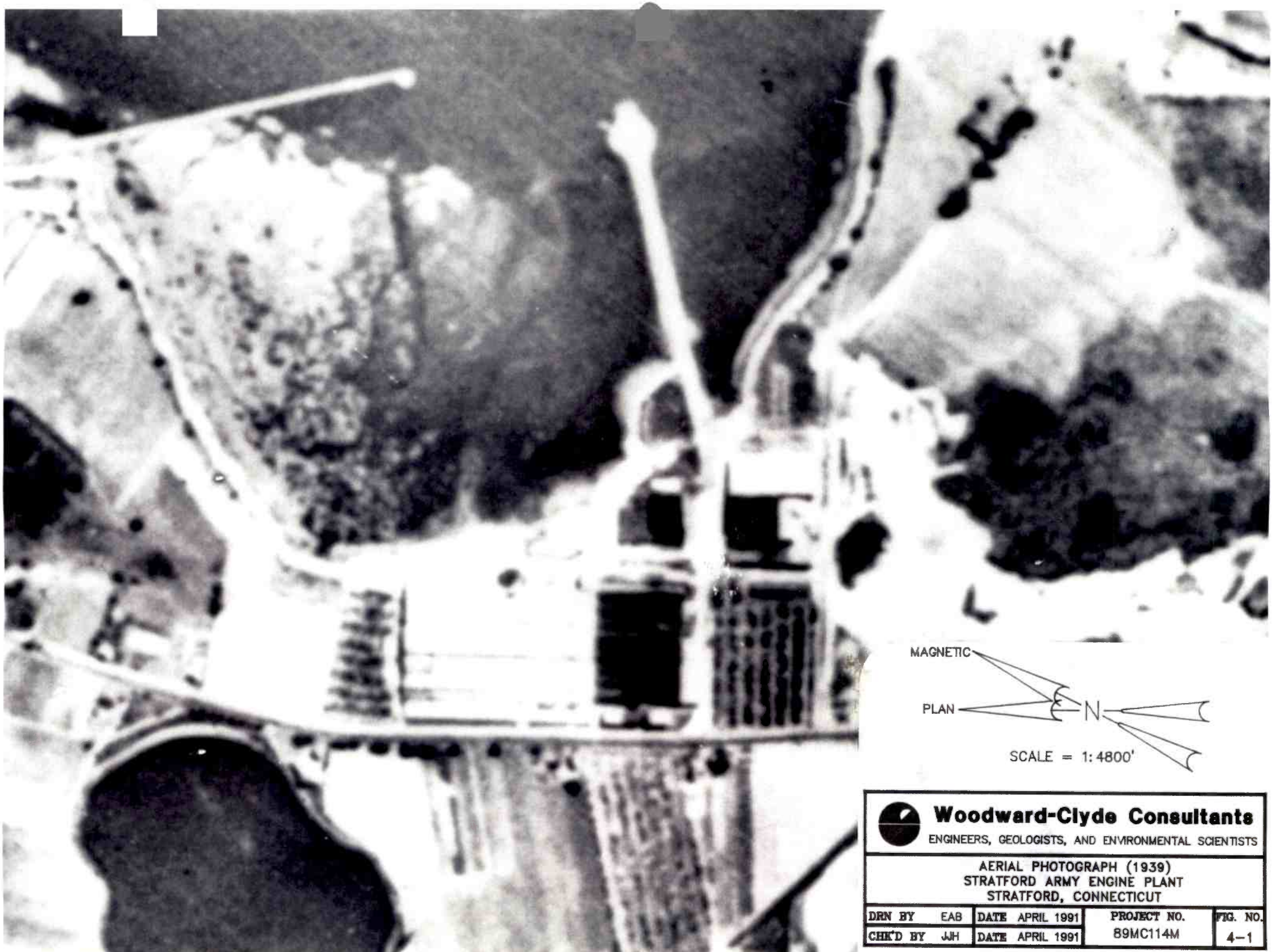
Building Number	Floor Tile	Transite Board	Pipe Wrap	Comment
B-1	High	Low	High	
B-2	High	High	High	Transite likely in barrel roof ends, boiler room, and east elevation facia
B-3 (3A)	High	High	High	Some ACM removed
B-4	High	High	High	
B-5	Medium	Low	High	Some ACM removed
B-6 (6A)	High	High	High	Estimated 70% ACM removed
B-7 (7A)	Medium	Low	High	Some ACM removed
B-8	Low	Low	Low	
B-9	Low	Low	Low	
B-10	Low	Low	Low	
B-12	Low	Low	High	
B-13	Low	Low	High	Estimated 90% ACM removed
B-15	Low	Low	High	Some ACM removed, but not from firehouse and storage area
B-16	Low	Medium	High	
B-17	Medium	Low	High	Some ACM removed
B-18	Low	Low	Low	Estimated 100% ACM removed
B-19	Medium	High	High	Some ACM removed; transite likely in exhaust housing
B-33	Low	Low	Low	
B-34	Low	Low	Low	
B-36	Low	Low	Low	
B-37	Low	Low	Low	
B-38	Low	Low	Low	
B-40	Low	Low	Low	
B-41	Low	Low	Low	
B-42	Low	Low	Low	
B-43	Low	Low	Low	
B-44	Low	Low	Low	
B-48	Low	Low	Low	
B-52	Low	Medium	Medium	
B-53	Low	Medium	Medium	
B-58	High	Low	Medium	
B-59	Low	Low	Medium	
B-60	Low	Low	High	Some ACM removed
B-61	Low	Medium	High	
B-63	Low	Low	High	
B-64-1	Low	Low	High	
B-64-2	Low	Low	High	
B-65	Low	Low	Low	
B-67	Low	Low	Low	
B-68	Low	Low	Low	
B-69	Low	Low	Low	
B-70	Low	Low	Low	
B-71	Low	Low	Low	
B-72	Low	Low	Low	
B-79	Low	Low	Low	

(1) Information in this table is based on interview information provided by SAEP personnel and has been supplemented by records review. A detailed asbetos survey was not conducted.

TABLE 4-8
LIST OF TRANSFORMERS THAT CONTAIN PCBs[1]

Location	Fluid[2]	Amount Liquid[3] Gal.	Amount Liquid[3] Lbs.	Manufacturer/ Serial Number	KVA Size
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528621	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528619	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B582620	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528629	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528623	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528624	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528628	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528627	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528625	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528618	1500
B-2 Roof Vault	Pyranol	520	6,800	G.E./B528626	1500
B-3	Pyranol	520	6,800	G.E./B528630	1500
B-3	Pyranol	520	6,800	G.E./B329971	300
B-3A	Pyranol	---	---	---/40227	500
B-3A	Pyranol	520	6,800	G.E./B528631	1500
B-16 Roof Vault	Pyranol	520	10,750	Larkin/L-1312-11	1500
B-16 Roof Vault	Pyranol	520	10,750	Larkin/L-1312-1	1500
B-19	Pyranol	520	6,800	G.E./C173607	1500
B-19	Pyranol	250	3,300	G.E./C173650	300
B-6 E Center	>50 ppm, <500 ppm	1,430	18,700	AL.CH./3048340	5000
B-6 E Center	>50 ppm, <500 ppm	1,430	18,700	AL.CH./3156991	1000

(1) Information in this table was extracted from SAEP file records.
(2) Pyranol oil contains PCBs >500 pp
(3) --- Not listed.

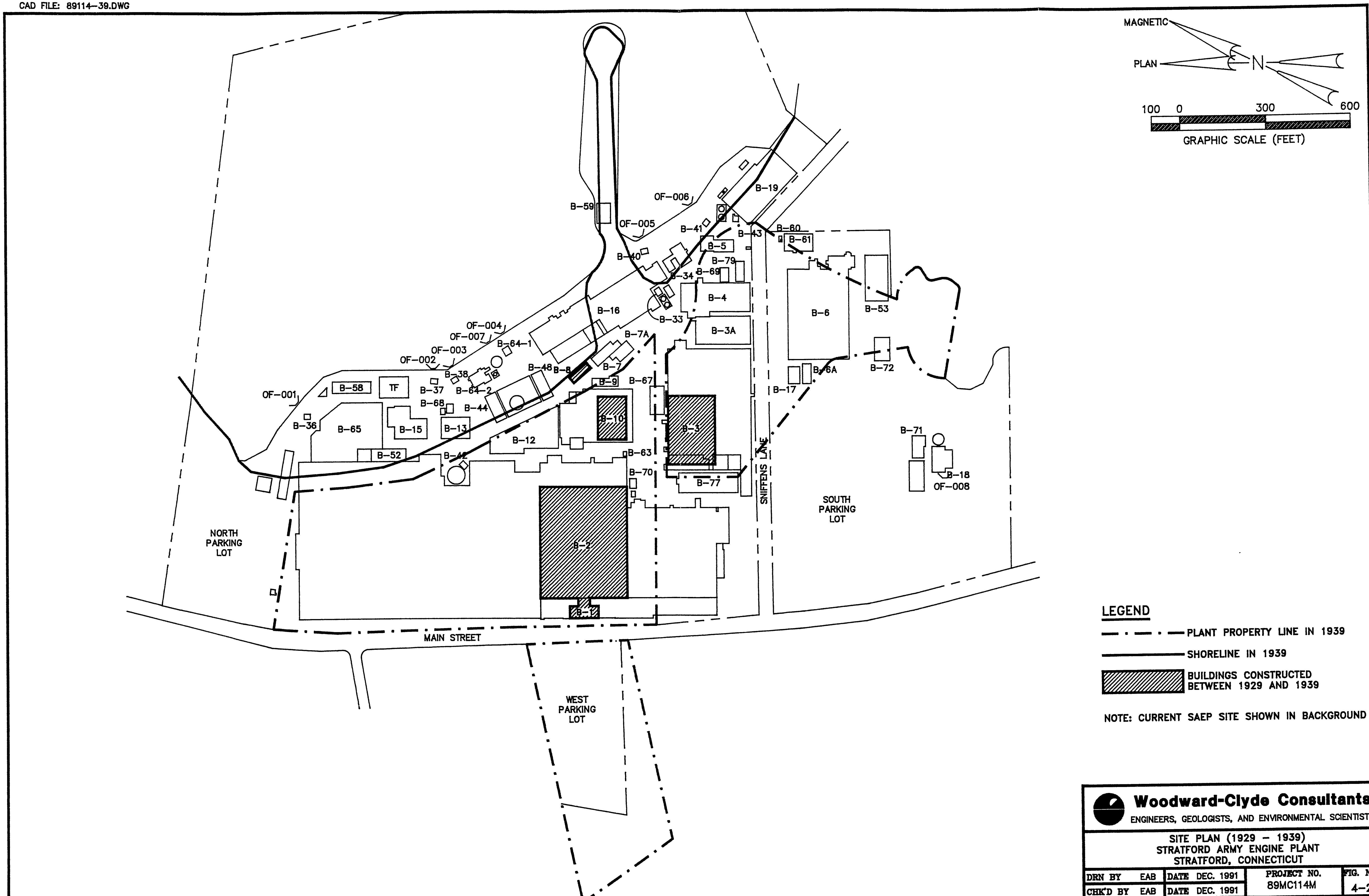


Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

AERIAL PHOTOGRAPH (1939)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-1

CAD FILE: 89114-39.DWG



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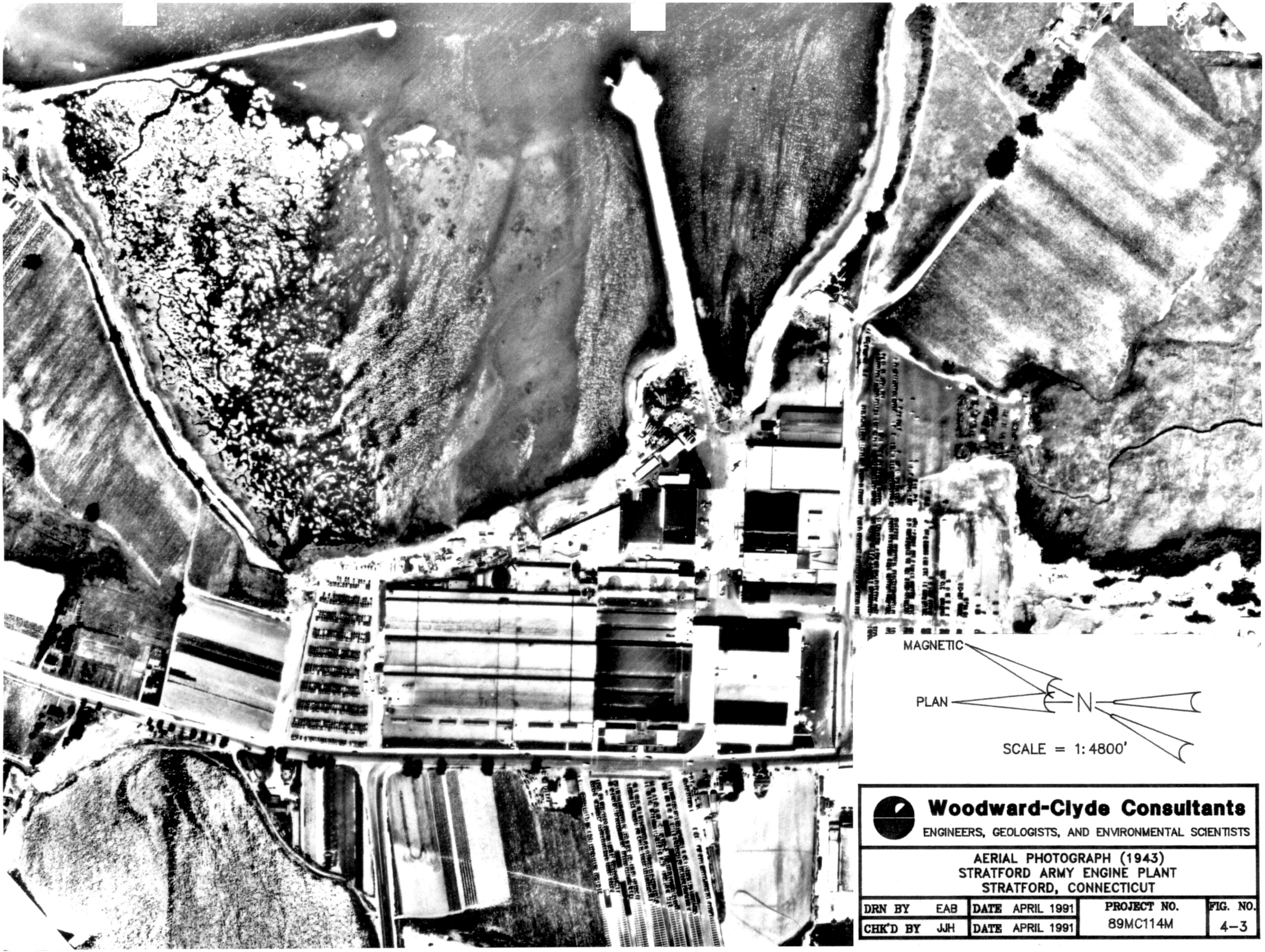
SITE PLAN (1929 – 1939)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE DEC. 1991	PROJECT NO. 89MC114M	FIG. NO. 4-2
CHK'D BY	EAB	DATE DEC. 1991		



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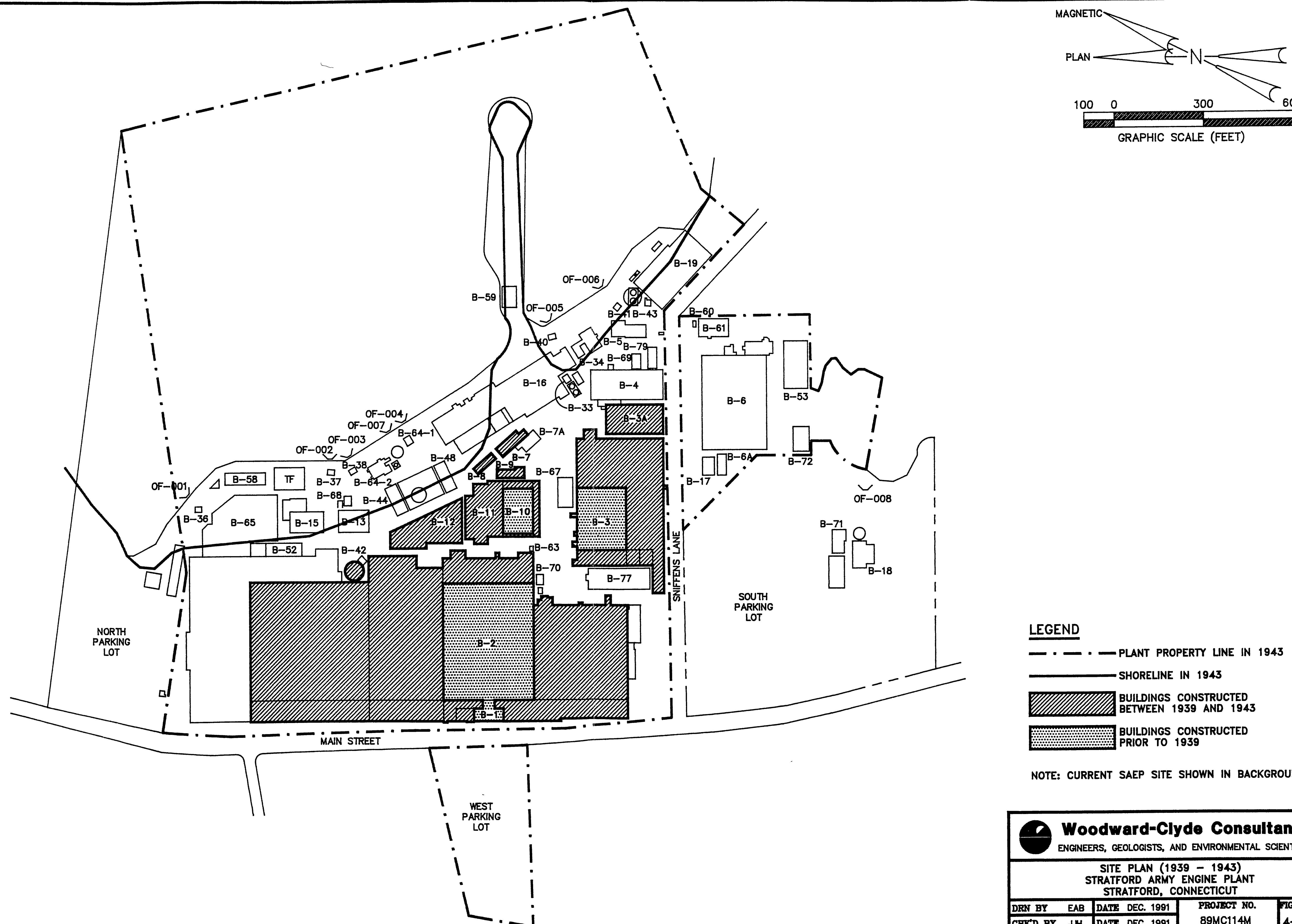
AERIAL PHOTOGRAPH (1943)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-3

CAD FILE: 89114-40.DWG



LEGEND

PLANT PROPERTY LINE IN 1943

SHORELINE IN 1943

BUILDINGS CONSTRUCTED BETWEEN 1939 AND 1943

BUILDINGS CONSTRUCTED PRIOR TO 1939

NOTE: CURRENT SAEP SITE SHOWN IN BACKGROUND

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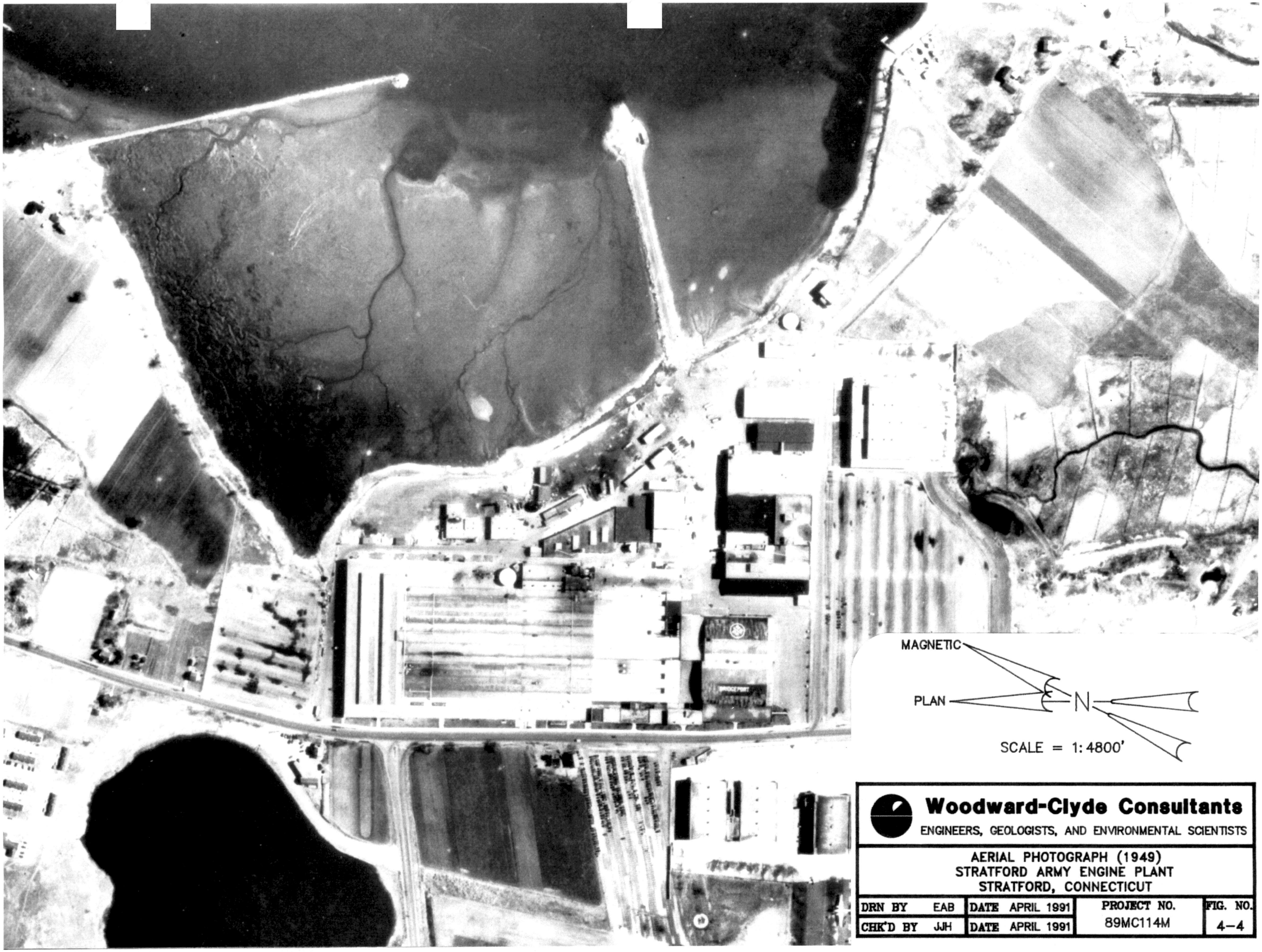
SITE PLAN (1939 - 1943)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE DEC. 1991	89MC114M	4-3A



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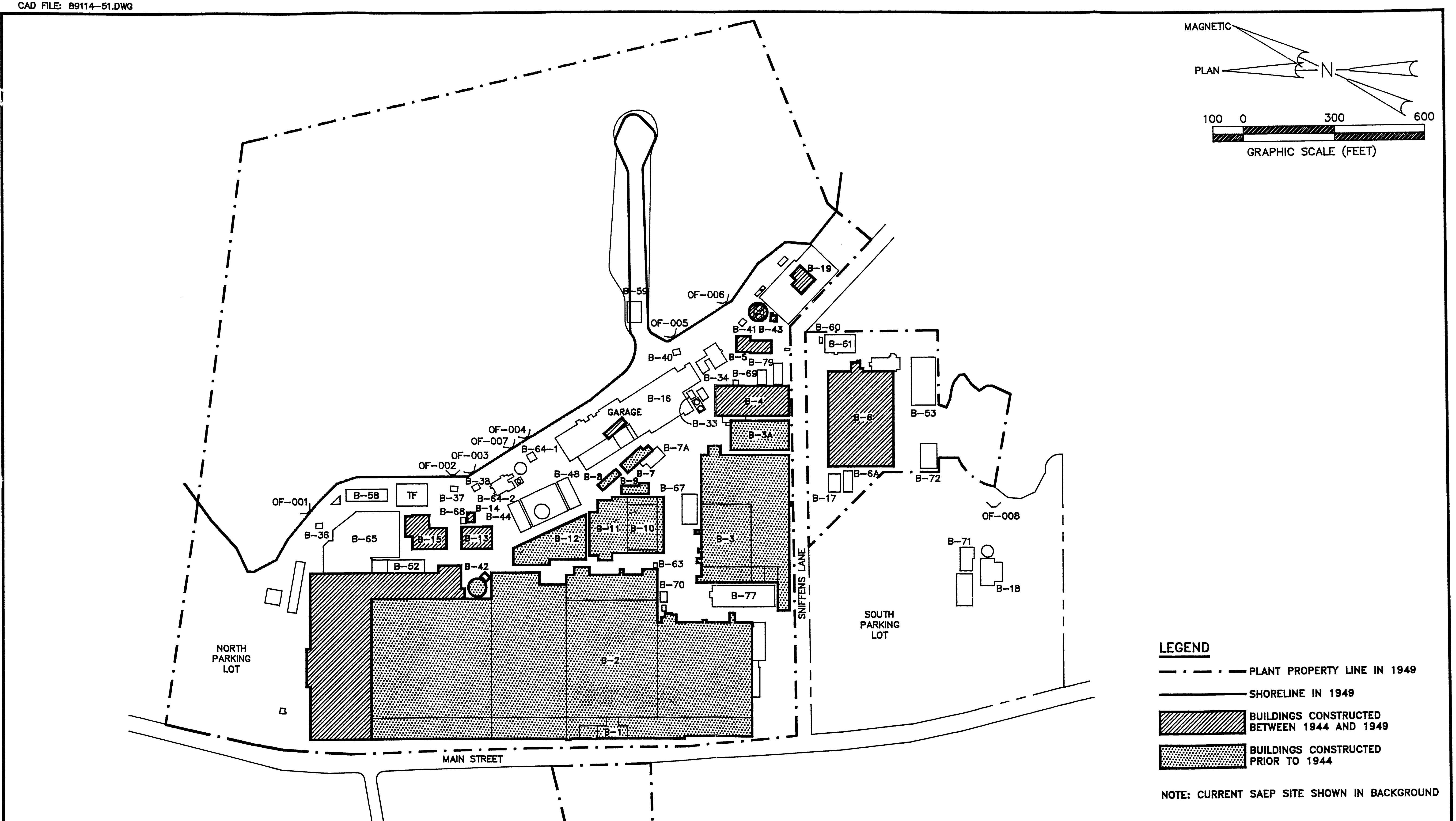
AERIAL PHOTOGRAPH (1949)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-4

CAD FILE: 89114-51.DWG



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SITE PLAN (1944 – 1949)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE DEC. 1991	89MC114M	4-5

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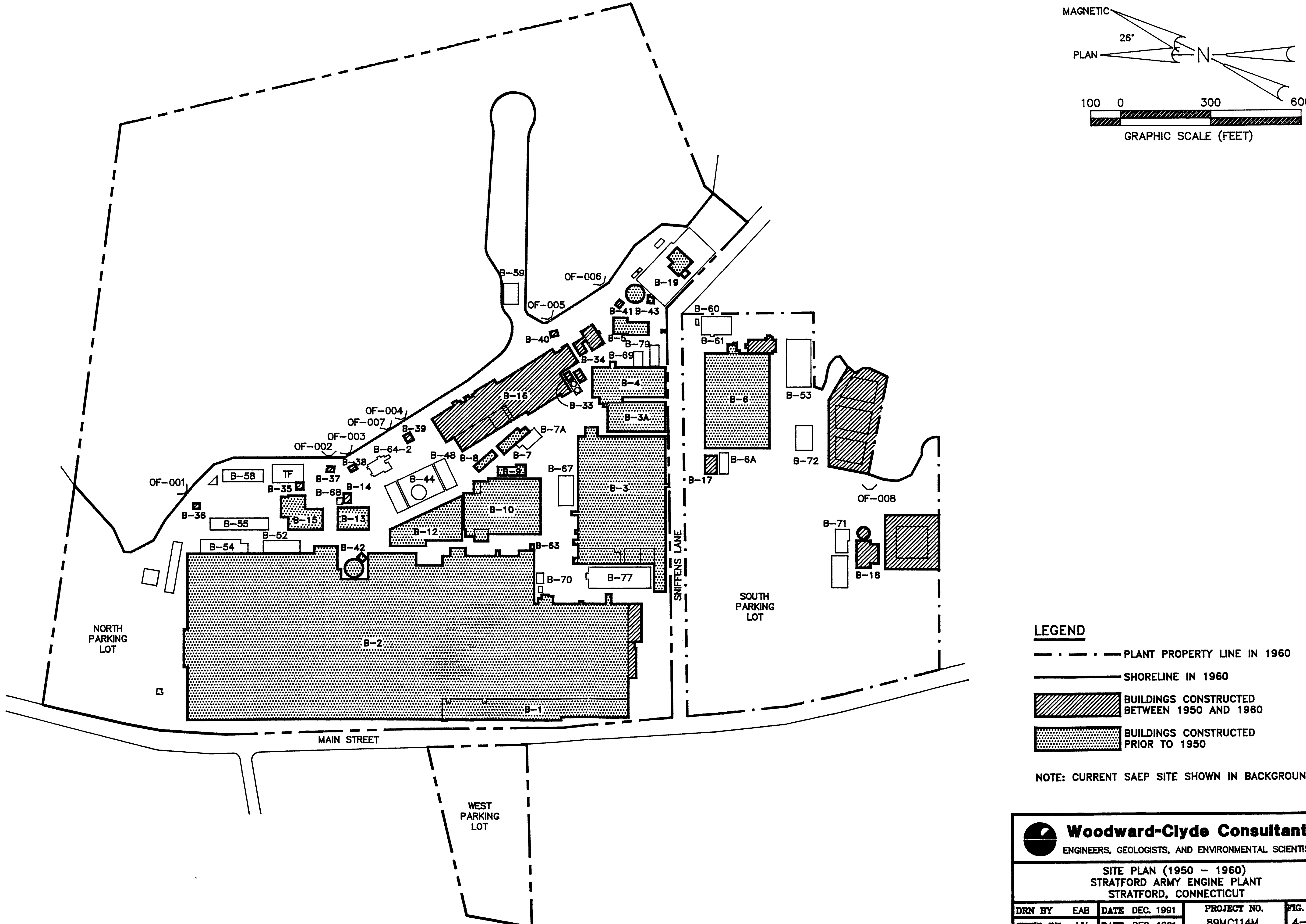
AERIAL PHOTOGRAPH (1960)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE	APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE	APRIL 1991	89MC114M	4-6

CAD FILE: 89114-41.DWG



LEGEND

- PLANT PROPERTY LINE IN 1960
- SHORELINE IN 1960
- BUILDINGS CONSTRUCTED BETWEEN 1950 AND 1960
- BUILDINGS CONSTRUCTED PRIOR TO 1950

NOTE: CURRENT SAEP SITE SHOWN IN BACKGROUND

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SITE PLAN (1950 – 1960)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE DEC. 1991	89MC114M	4-6A

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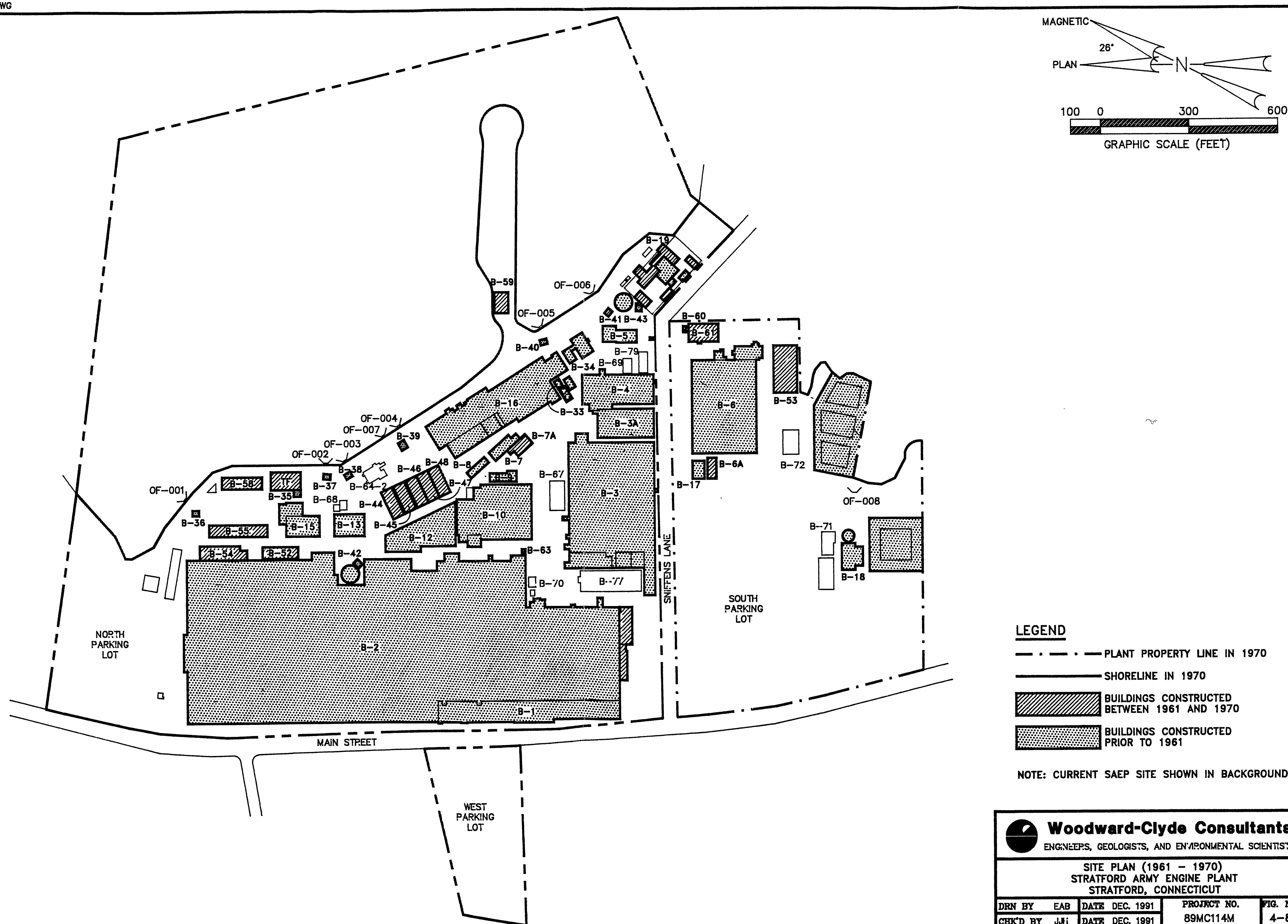
AERIAL PHOTOGRAPH (1970)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE	APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE	APRIL 1991	89MC114M	4–7

CAD FILE: 89114-52.DWG



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SITE PLAN (1961 – 1970)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJI	DATE DEC. 1991	89MC114M	4-8

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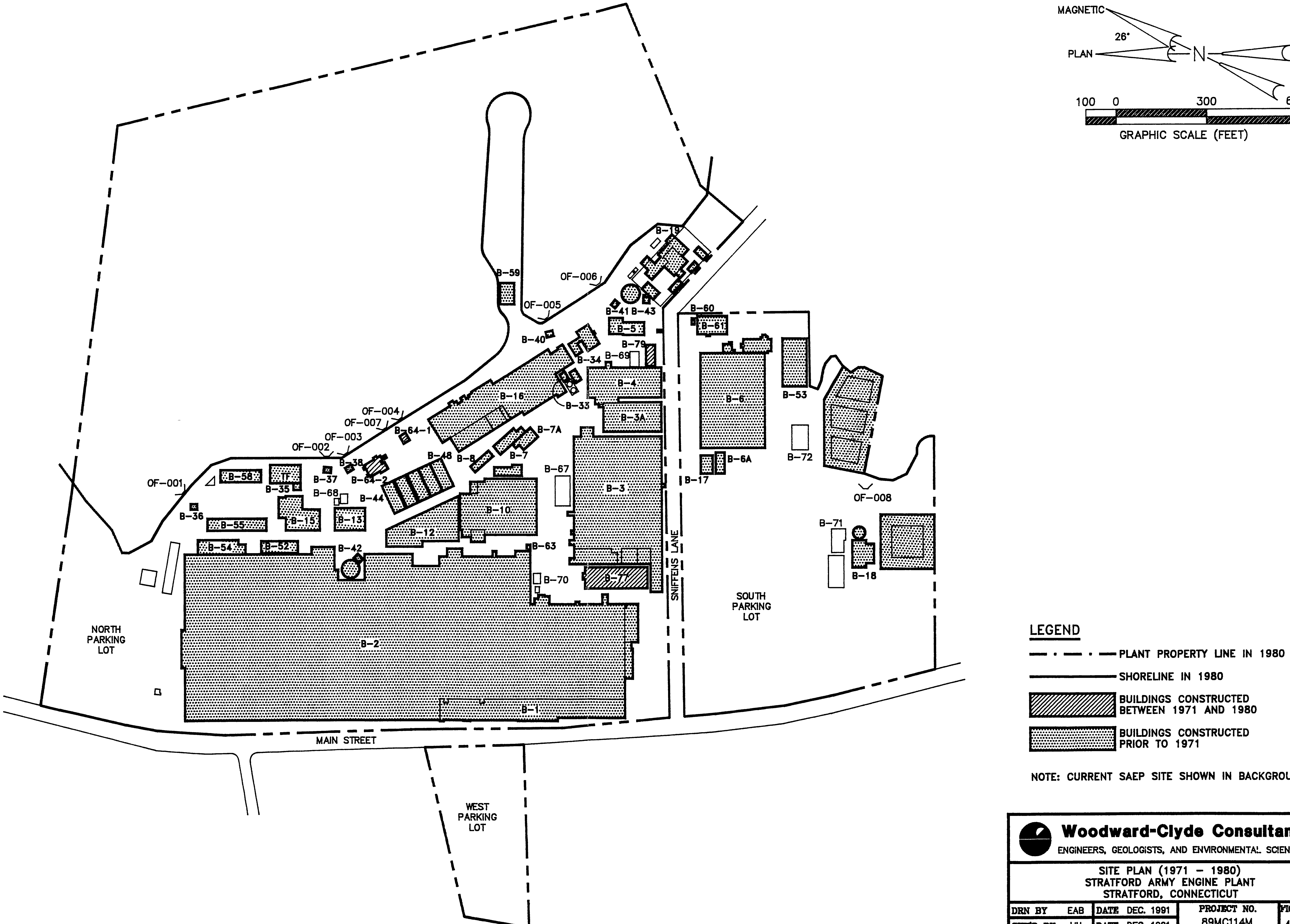
AERIAL PHOTOGRAPH (1980)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-9

CAD FILE: 89114-42.DWG



LEGEND

PLANT PROPERTY LINE IN 1980

SHORELINE IN 1980

BUILDINGS CONSTRUCTED BETWEEN 1971 AND 1980

BUILDINGS CONSTRUCTED PRIOR TO 1971

NOTE: CURRENT SAEP SITE SHOWN IN BACKGROUND

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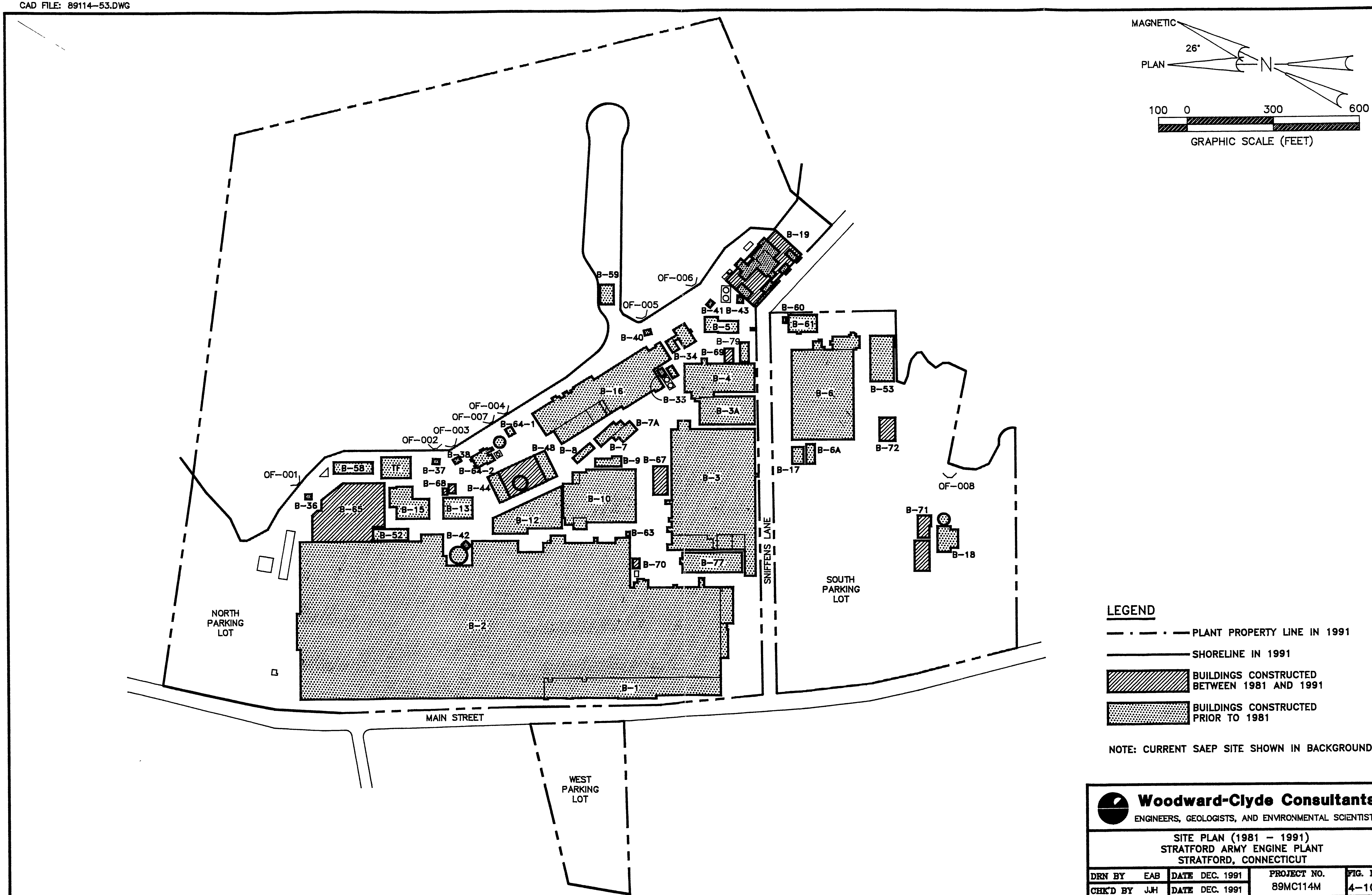
SITE PLAN (1971 – 1980)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE DEC. 1991	89MC114M	4-10

CAD FILE: 89114-53.DWG



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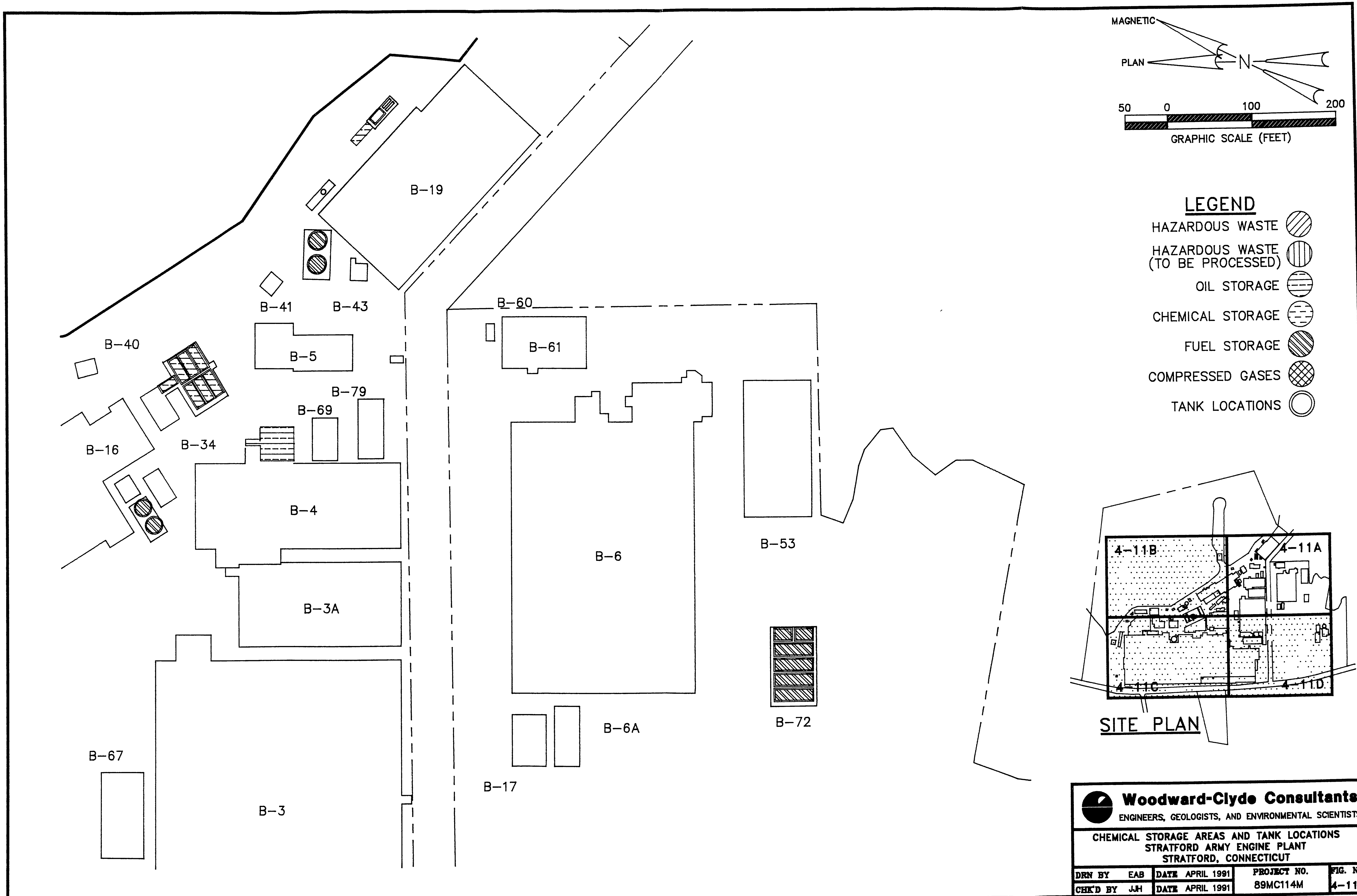
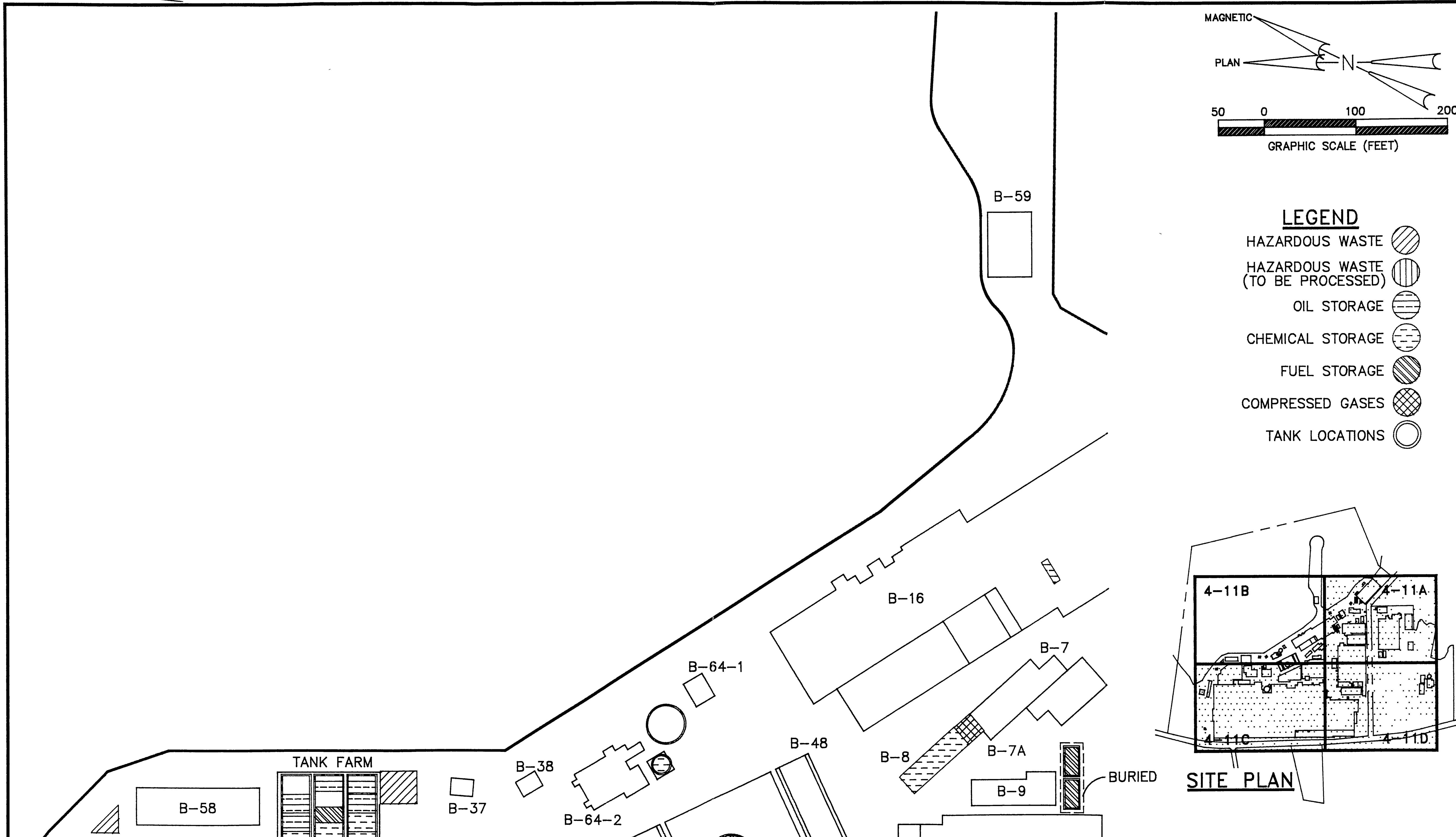
SITE PLAN (1981 – 1991)
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE DEC. 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE DEC. 1991	89MC114M	4-10A


MAGNETIC
PLAN
N
50 0 100 200
GRAPHIC SCALE (FEET)
LEGEND
HAZARDOUS WASTE
HAZARDOUS WASTE (TO BE PROCESSED)
OIL STORAGE
CHEMICAL STORAGE
FUEL STORAGE
COMPRESSED GASES
TANK LOCATIONS
B-19
B-41
B-43
B-40
B-5
B-60
B-61
B-79
B-69
B-16
B-34
B-4
B-6
B-53
B-3A
B-72
B-6A
B-67
B-17
B-3
4-11B
4-11A
4-11C
4-11D
SITE PLAN
Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS
CHEMICAL STORAGE AREAS AND TANK LOCATIONS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT
DRN BY EAB
DATE APRIL 1991
CHK'D BY JJH
DATE APRIL 1991
PROJECT NO.
89MC114M
FIG. NO.
4-11A



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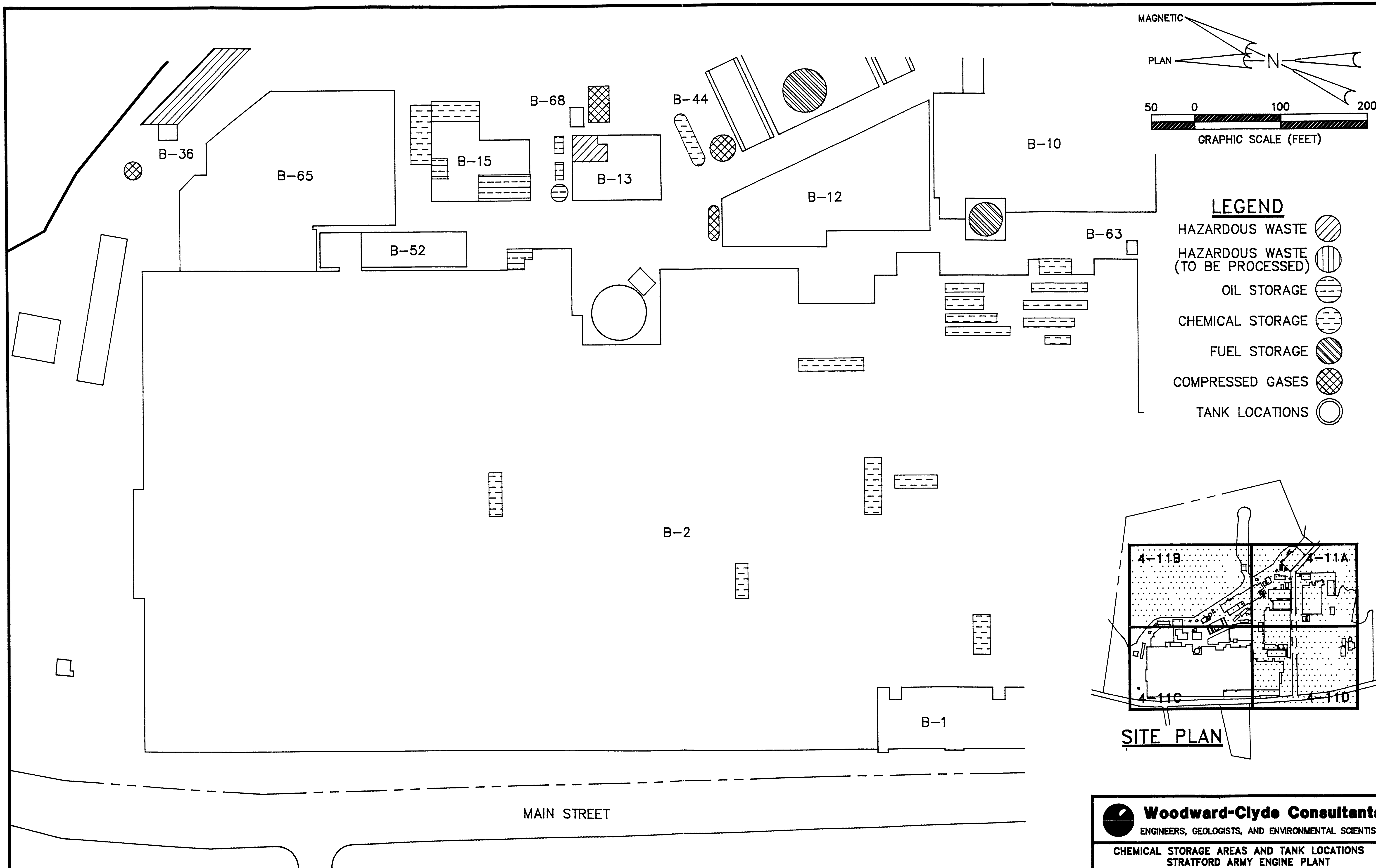
CHEMICAL STORAGE AREAS AND TANK LOCATIONS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-11B



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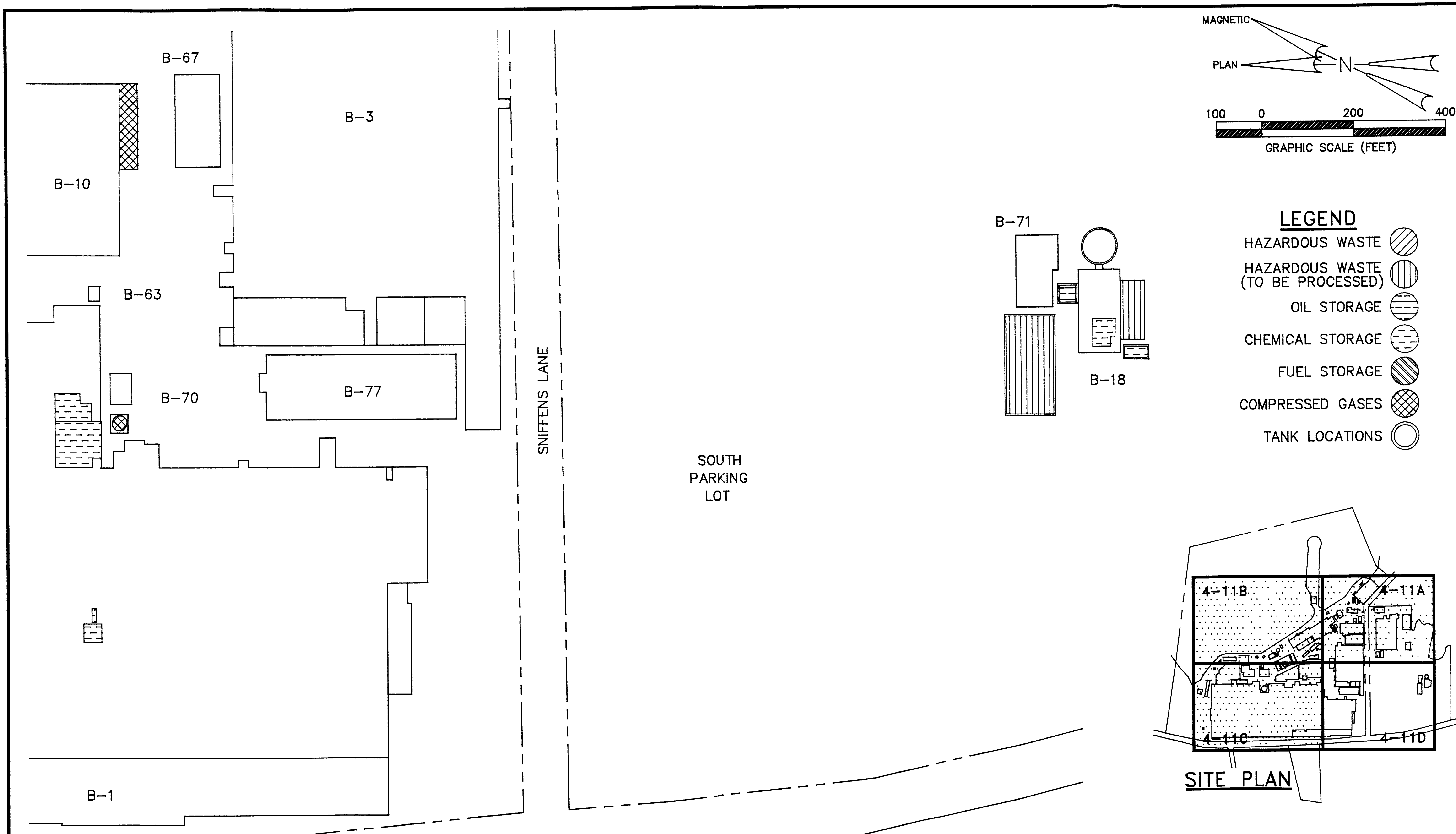
CHEMICAL STORAGE AREAS AND TANK LOCATIONS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE APRIL 1991	89MC114M	4-11C



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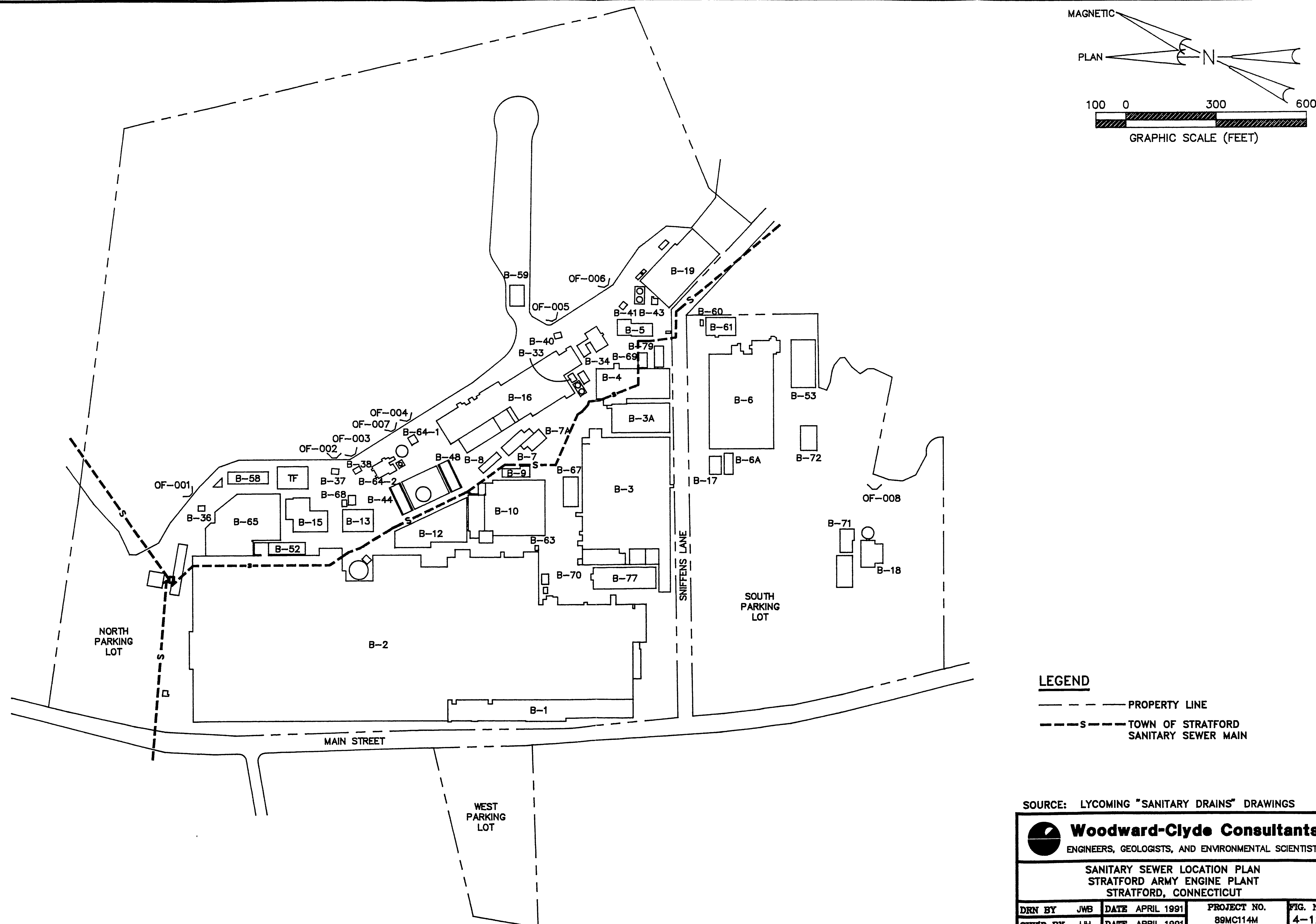
CHEMICAL STORAGE AREAS AND TANK LOCATIONS
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M	4-11D

CAD FILE: 89114-55.DWG



LEGEND

PROPERTY LINE

TOWN OF STRATFORD SANITARY SEWER MAIN

SOURCE: LYCOMING "SANITARY DRAINS" DRAWINGS

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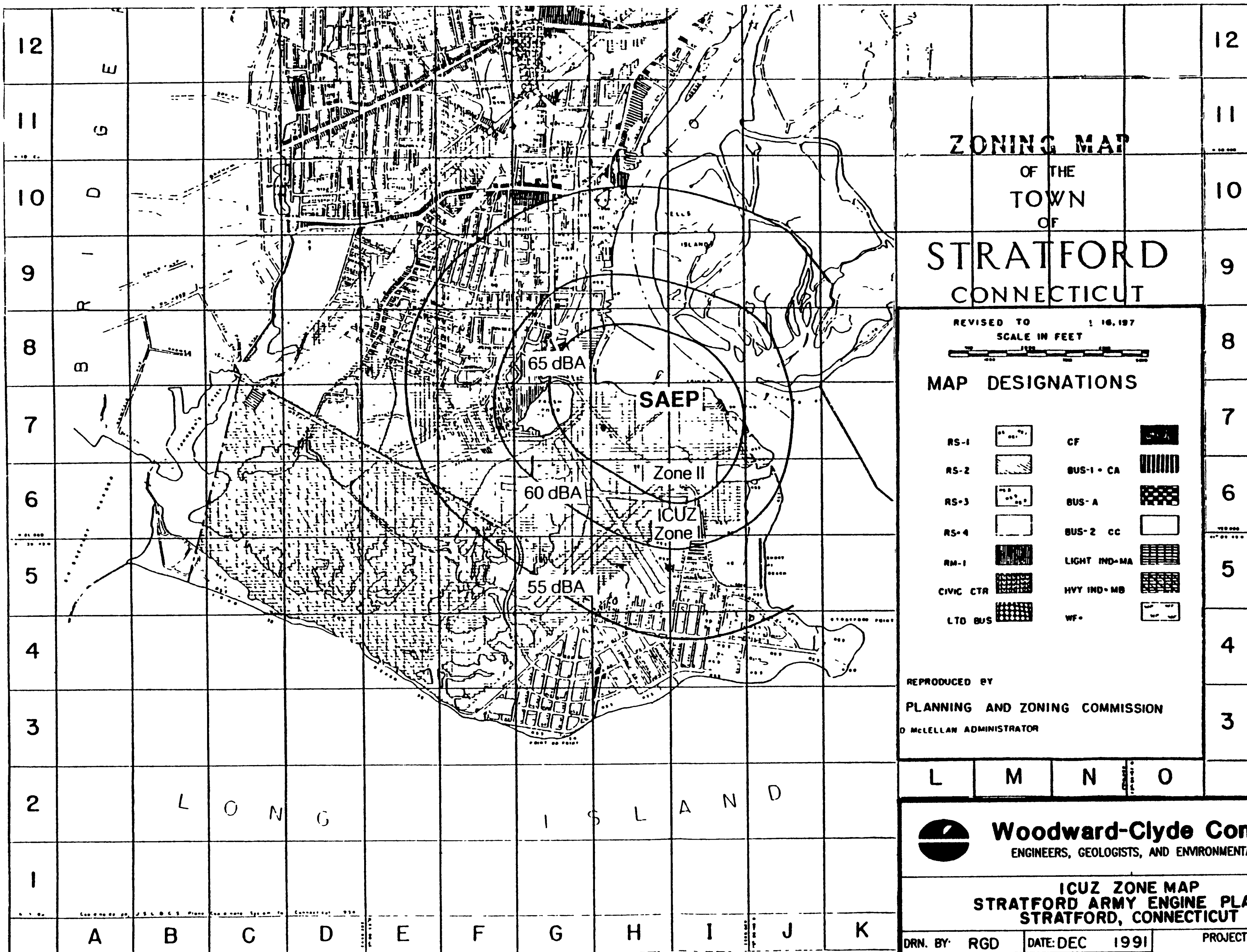
SANITARY SEWER LOCATION PLAN
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	JWB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE APRIL 1991	89MC114M	4-12



Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

ICUZ ZONE MAP
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN. BY: RGD	DATE: DEC 1991	PROJECT NO.	FIG. NO.
CHK'D BY: JJH	DATE: DEC 1991	89MC114M	4-13

5.0
ENVIRONMENTAL COMPLIANCE

This section provides a summary of compliance issues related to the various state and federal environmental statutes and regulations that apply to SAEP. This summary highlights past compliance problems, compliance actions in progress, and possible areas for future concern. This summary does not, however, serve as a detailed compliance audit, which would list every violation of environmental requirements whether or not it has been addressed by a regulatory agency. Audits for this purpose have been conducted in the last few years by AMC (1987) and TLS, 1990).

This section was not prepared by legal counsel and does not constitute a legal analysis, opinion, or advice. This summary briefly addresses: records of past inspections and compliance actions; reports submitted by SAEP to the DEP, EPA Region I, and other regulatory agencies; and compliance issues that may be encountered in the future.

5.1 RESOURCE CONSERVATION AND RECOVERY ACT OF 1976 (RCRA)

5.1.1 Subtitle C: Hazardous Waste Management

SAEP is listed on the EPA Federal Agency Hazardous Waste Compliance Docket (originally published in 53 FR 4280, February 12, 1988). The docket serves three purposes:

- To identify the universe of Federal facilities that must be evaluated to determine if they pose risk to public health and the environment

- To compile and maintain the information submitted to EPA on these facilities under the provisions listed in section 120(c) of CERCLA

- To provide a mechanism to make this information available to the public.

SAEP was on the original February 12, 1988 list, and its listed status has not changed in the subsequent revisions. SAEP is listed because of activities or reporting related to RCRA Sections 3005, 3010, and 3016, but is not listed under the remaining category of CERCLA Section 103. RCRA Section 3005 concerns submission of permit applications for treatment, storage, and disposal facilities (TSDFs); this listing presumably regards the Part A application submitted by SAEP in 1980. RCRA Section 3010 concerns notification to EPA by generators or TSDFs stating the location and description of hazardous waste activities and the identified or listed hazardous wastes generated, treated, stored, or disposed of at the facility. RCRA Section 3016 requires that each federal agency identify facilities it owns (or has owned) or operates (or has operated) that have been the site of some type of TSDF operation, for example, the lagoons at SAEP. CERCLA Section 103 requires reporting to the National Response Center of non-permitted releases of hazardous substances in excess of the reportable quantity (CERCLA Section 102). Generally, a release that is required to be reported under the Emergency Planning and Right-to-Know Act will also be required to be reported under CERCLA Section 103.

5.1.1.1 State/Federal Authority

Until January 31, 1986, DEP had authority for managing Subtitle C in Connecticut. At that time, the program reverted to EPA. As of January 1, 1991, DEP regained authority from EPA for management of this program.

5.1.1.2 Compliance History

5.1.1.2.1 **Part A and Part B Applications.** The Part A application for interim status as a hazardous waste TSDF was submitted on November 13, 1980. SAEP is currently operating under interim status (40 CFR 265) as a "large-quantity" generator under ID No. CTD001181502 (AVCO Lycoming Stratford).

EPA regulations (40 CFR 270.73[g]) specify that interim facility status expires on November 8, 1992 unless the facility submits a Part B application for final permit status as a TSDF by November 8, 1988. This is significant because a facility must either go through the closure process for each hazardous waste management (HWM) unit listed in the Part A application by November 8, 1992 or have submitted the Part B application for change to final permit status (40 CFR 264). Although SAEP intends to close all units that would be subject to the TSDF regulations (40 CFR parts 264 and 265), a Part B application was submitted to fulfill regulatory requirements, since closure will not be complete by November 8, 1992. The Part B application for SAEP was submitted on November 8, 1985 (received by DEP on November 13, 1985), so SAEP is compliant with the regulations even though no action has been taken by DEP. After closure has been completed on all HWM units, SAEP will operate under generator-only status, with less stringent operating and reporting requirements than under TSDF requirements.

5.1.1.2.2 Annual/Biennial Reports. Annual reports required of SAEP include those for exporters of hazardous waste (40 CFR 262.56), and for groundwater monitoring systems at interim status facilities (40 CFR 265.94).

Biennial reports required of SAEP include those for generators of hazardous waste (40 CFR 262.41), and for interim status TSDFs (40 CFR 265.75).

5.1.1.2.3 Inspections/Compliance Actions/Current Regulatory Status

Inspections. SAEP is inspected annually for compliance with the requirements of RCRA Subtitle C. Inspection reports in the SAEP files indicate that past inspections were conducted by DEP or EPA, or were joint DEP/EPA inspections.

Manifest Warning Letters. Since 1984, 37 Letters of Warning have been sent to SAEP by DEP for deficiencies in completion of hazardous waste manifests: 1 in 1984; 3 in 1985; 7 in 1986; 7 in 1987; 14 in 1988; 4 in 1989; 1 in 1990; and none to date in 1991. Several letters refer to more than one manifest. Deficiencies include missing analytical results, transporter name or ID number, manifest document numbers, waste ID numbers (DOT or EPA), and waste quantities; container type not specified; use of incorrect EPA generator ID number; point of departure from the United States not specified for international shipments; failure of the generator or transporter to sign and date the manifest; illegible manifests; and failure to respond to a manifest warning letter (April 1989 letter [date is not legible] regarding a June 24, 1988 letter of warning). All but six of the warning letters are marked "OK", indicating that the required corrections were made and submitted to DEP. The six letters that have not been marked "OK" by DEP are the August 12, 1988; October 10, 1988 (2); October 31, 1988; April, 1989; and November 12, 1990 letters.

Other Warning Letters/Notices of Violation. In a May 22, 1986 letter, DEP notified AVCO (sic) that it had failed to submit the 1985 generator biennial report by March 1, 1986, as required, and that the report must be submitted before June 30, 1986. In a August 6, 1986 "Notice", DEP informed TLS that the submitted report had been completed incorrectly. The letter states that "combined reports are not acceptable. Facility and the Generator information should be described on separate reports," referring to the biennial interim status TSD facility report required by 40 CFR 265.75 and the biennial generator report required by 40 CFR 262.41. The letter indicates that an incorrect code, referring to underground injection (which is not allowed in Connecticut), was used on the report. DEP records indicate that the corrected report was received on August 26, 1986.

On November 28, 1986, DEP issued Notice of Violation No. 291 for violations noted on the June 10, 1986 inspection.

In a June 15, 1989 warning letter, DEP notified AVCO Lycoming Textron (sic) that it had failed to submit the 1988 facility hazardous waste biennial report by March 1, 1989, as required, and that the report must be submitted before July 15, 1989. The report was submitted by SAEP, but there was no notation on DEP's copy of the warning letter to indicate that the report had been received.

DEP Orders. Several orders have been issued by DEP to bring SAEP into compliance with hazardous waste management regulations.

Order No. HM-215. Issued October 22, 1984 to "Bring all waste handling procedures and facilities into compliance with the State's Hazardous Waste Management Regulations," and to "Effect the removal and proper disposal of all hazardous, toxic, and other industrial waste now stored on-site in a manner approved by the Commissioner of Environmental Protection."

In a "Letter of Compliance" dated February 18, 1986, the DEP determined that AVCO Lycoming (sic) had achieved compliance with DEP Order No. HM-215, as determined by a January 6, 1986 compliance inspection.

Order No. HM-358. Issued September 25, 1986 and modified on November 26, 1986 to change the compliance schedule, ordered SAEP to "Investigate the rate and extent of contaminant migration and degree of groundwater contamination resulting from chemical and hazardous waste management practices at the South Main Street site." A hydrogeologic assessment and groundwater monitoring plan was to be submitted, along with recommendations for further investigation.

Order No. HM-572. Issued January 23, 1988 to "Bring all waste handling procedures and facilities into compliance with all Connecticut Hazardous Waste Management Regulations," including:

- Compliance with closure requirements
- Submission of a revised Part A application
- Submission of a detailed description of hazardous waste management procedures to be implemented in order to bring the facility into compliance
- Updating of the site contingency plan, waste analysis plan, and preparedness and prevention plan.

No correspondence was discovered during this study to indicate if DEP considers SAEP to be in compliance with this order.

Order No. HM- (number missing). Issued for improper completion of manifests for shipments of hazardous waste to Canada. Compliance action is now complete on this issue.

5.1.1.2.4 Groundwater Monitoring. The present groundwater monitoring system is limited to the area near the now-closed lagoon system. SAEP has been submitting the required (by 40 CFR 265.94) annual groundwater monitoring (GWM) reports for seven years (the seventh annual report was completed on February 6, 1991 and submitted to DEP). Additional monitoring wells were being installed near the CWTP at the time of this survey. SAEP appears to be complying with DEP GWM installation and reporting requirements. According to SAEP's environmental coordinator, installation of the wells has been completed and the DEP is close to closing out Order HM-358.

The groundwater monitoring system has detected significant increases in several contaminants (ESE, 1991).

5.1.1.3 Closure Requirements

5.1.1.3.1 Lagoon Closure. Closure of this unit, which includes 3 former storage lagoons and a former equalization basin, was completed in the summer of 1989. The certification of closure has been submitted to DEP. The government did not sign the certification, although the regulations (40 CFR 265.115) require only that the owner or operator sign and submit the certification.

5.1.1.3.2 Drum Storage Area Closure. A closure plan for the drum storage area located in a steel-roofed building next to B-18 was submitted to the DEP for review and approval. DEP estimates the closure plan review will take between 1.5 to 2 years because TSDF permits have a higher priority than closure plans.

5.1.1.4 Future Regulatory Status/Issues

5.1.1.4.1 Post-closure Requirements. EPA regulations require post-closure monitoring and reporting for 30 years after closure of a hazardous waste management unit, such as the lagoons at SAEP. The lagoon closure cannot be considered a "clean closure" because contaminated soil was removed only to the low tide water level. It is possible that the monitoring system will continue to detect residual contamination from the site, which could require the implementation of corrective measures to remediate the soil and groundwater.

5.1.1.4.2 RCRA Corrective Action vs. CERCLA Remedial Action. RCRA corrective actions are meant to be more flexible than those under CERCLA and are meant to lend consistency to state implementation of remedies (Environment Reporter, 1990). Draft RCRA corrective action regulations were proposed on July 27, 1990 and may become final within two years.

At this time, it appears that any corrective actions for contaminated soil or groundwater at SAEP would be undertaken under RCRA. Previous investigations conducted by and for EPA have resulted in a recommendation that no further remedial action be planned for SAEP under CERCLA (see Section 5.2.2). It is possible that SAEP could again come under CERCLA consideration, but it does not seem likely for several reasons: RCRA corrective action rules are meant to be used at operating RCRA facilities, such as SAEP; the risk to public or private water supplies from contamination at SAEP has been determined to be insignificant; and EPA seems to be shifting the regulatory authority over cleanups to the states (under RCRA) when possible. Corrective actions at SAEP under RCRA would be undertaken under DEP authority, while EPA would have authority over CERCLA remedial actions.

5.1.2 Subtitle I: Regulation of Underground Storage Tanks

5.1.2.1 Information From File and TESS Report

Most underground petroleum storage tanks (USTs) at SAEP have been removed and replaced with aboveground tanks. The six remaining USTs are:

- One 500-gallon waste fuel tank
- One 500-gallon waste oil tank
- Two 3,000-gallon gasoline tanks

The two gasoline tanks were installed in 1989; no information concerning the installation dates of the other tanks was found. Information indicating the type of tanks (concrete, steel, fiberglass) and the age of the tanks was reported in the TESS report and is contained in Table 4-3.

5.1.2.2 Compliance With Regulations

DEP has several requirements that are more stringent than the federal requirements: the time schedule for upgrading of tanks; aboveground storage tanks are regulated; and releases are to be reported immediately. Heating fuel tanks of 2100-gallon capacity or greater are regulated under state law.

The TESS report indicates that all USTs are provided with secondary containment and leak detection, and that all required notifications were completed. Based on information in the TESS report, this program appears to be in compliance with applicable federal requirements. Not enough information was available in that report or in SAEP files to determine compliance with state regulations.

5.2 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA)

5.2.1 State/Federal Authority

CERCLA is a federal program with states' involvement in determining whether a site presents a significant enough hazard to warrant inclusion on the National Priorities List (the NPL, also referred to as the "Superfund" list). As noted below, SAEP is not under consideration at this time for addition to the NPL.

Connecticut has a "superfund" law for funding remediation at sites that do not present a significant enough hazard to warrant inclusion on the NPL and/or for which a responsible party cannot be identified or is unwilling or unable to pay. The State Superfund is intended to pay for remedial activities completed by the State. The State is required to seek reimbursement for these costs from the responsible party (i.e., the Superfund is not a grant program to be used by responsible parties for remediation of contaminated sites).

The State has established a Superfund Priority List (SPL) for sites deemed eligible for the expenditure of state funds. SAEP does not appear to be eligible for inclusion on the SPL for several reasons:

- The threat to the environment and the public health does not appear to require immediate expenditure of state money to reduce the hazard.

- Even is there was a need for immediate remedial action, State money would only be used after it was determined that SAEP was unwilling to undertake a remedial action required by the State.

No information was found in SAEP files to indicate that the DEP is considering inclusion of SAEP on the SPL.

The statutes regarding the state Superfund are found in the Connecticut General Statutes, Title 22a, Chapter 445, at 22a-133. The state Superfund regulations are found in the Regulations of Connecticut State Agencies, Title 22a, Chapter 133f.

5.2.2 Regulatory History/Current Regulatory Status

A preliminary assessment (PA) of SAEP, dated June 10, 1987 and a site inspection (SI), dated 1988 have been completed by EPA. Following completion of the PA and SI, an NUS Corporation Field Investigation Team (FIT) conducted a population/water supply survey for SAEP. In a memo dated June 12, 1990, NUS recommends "no further remedial action be planned," based on their finding that "there are no known public or private drinking water sources along the groundwater and surface water pathways within a three-mile radius" of SAEP. This recommendation effectively removed SAEP from consideration for the NPL; the official notice of removal from further consideration came to SAEP in a July 16, 1990 letter from EPA. This recommendation does not mean that there is no hazard associated with the site; rather, it means that the site does not require further investigation under CERCLA. Further corrective action under RCRA could be required.

5.2.3 Future Regulatory Status/Issues

This subject was discussed in Section 5.1.1.5.2.

5.3 EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 (EPCRA, ALSO Referred To As SARA Title III)

5.3.1 Federal Authority

Federal facilities are exempt from reporting requirements found in Subtitle B of SARA Title III, but according to EPA, Government Owned/Contractor Operated facilities "are subject to Title III to the same extent as any other operator and, therefore, are statutorily required to comply with the full range of requirements under the "Emergency Planning and Community Right-to-know Act" (EPA, 1988).

5.3.2 Current Regulatory Status

A review of SAEP files indicates that the facility has apparently been complying with the reporting requirements of Subtitle B of EPCRA.

5.3.3 Future Regulatory Status/Issues

Since TLS is not presently excluded from the requirements of this act, its regulatory classification would not change if it changed from facility operator to facility owner/operator.

5.4 CWA (FEDERAL WATER POLLUTION CONTROL ACT OF 1972, AS AMENDED BY THE CLEAN Water Act of 1977)

5.4.1 State/Federal Authority

Connecticut has the authority to administer all CWA programs, including the NPDES permit program, the industrial pretreatment program, and the stormwater discharge permit program. Cleanup of sediments potentially contaminated by SAEP's wastewater discharges could be administered through the CWA by the DEP, although the RCRA or CERCLA units of DEP or EPA could become involved if other corrective measures were required under either of those programs.

5.4.1.1 Discharge to Surface Waters

SAEP's NPDES permit (No. CT0002984), issued to Avco Lycoming-SAEP by DEP on July 29, 1985, expired on July 29, 1990. The renewal application was submitted to DEP in January 1990, and SAEP continues to discharge under the 1985 permit while DEP finalizes the draft permit. The permit allows direct discharge to the Housatonic River from 8 outfalls, designated as discharge serial numbers 001 through 008. Outfall 008a is described in the permit as the discharge point for cyanide wastewaters after pretreatment; however, Outfall 008a no longer exists, and discharge from CDF is to the CWTP.

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The permit indicates that the Housatonic River is classified SC/SB at the point of discharge for SAEP. Connecticut Water Quality Standards regulations indicate that the SC/SB classification signifies that the water quality goal for the river is class SB, but the river is not presently meeting SB water quality criteria, so is classified as SC. The differences between the classifications are: SB criteria require a dissolved oxygen (DO) content of 5.0 mg/l at all times, while SC waters may experience lower concentrations; coliform bacteria concentrations in SC waters may exceed the SB criterion of a log mean of 200 organisms/100 ml; and concentrations of chemical constituents in SC waters may be present in concentrations that limit the distribution or abundance of aquatic life. Designated uses for SB waters are marine fish, shellfish, and wildlife habitat, and recreational, industrial, or other uses, including navigation. The permit does not indicate which parameters are not meeting the SB criteria or which uses are being impaired.

The draft NPDES permit requires quarterly sampling and analysis of effluent from outfalls OF-007 and OF-008 for acute and chronic aquatic toxicity (see Section 5.4.3.2 for discussion of draft NPDES permit).

On March 18, 1991, the regulatory deadline, Textron submitted a Part 1 application on behalf of 37 Textron Inc. facilities in order to acquire a group stormwater discharge permit. (The deadline for submittal of the Part 1 application has since been changed to September 30, 1991, and the deadline for submittal of the Part 2 application has been changed to May 18, 1992 [56 FR 12098, March 21, 1991]).

5.4.1.2 Compliance History/Orders

Several spills of hazardous materials have resulted in discharges to surface waters.

- October 29, 1981. Approximately 20 gallons of "Zyglo", a dye used for nondestructive inspection of metal parts, was spilled into a storm drain and discharged from Outfall 007.

- July 29, 1979. Approximately 75 gallons of oil sludge from the OATP bypassed clogged skimmers and discharged from Outfall 007. SAEP was notified of the problem by the U.S. Coast Guard, which was searching for the source of an oil slick on the Housatonic River (SAEP was apparently the sole source).

- May 8, 1978. Twenty-five to thirty pounds of chromic acid was spilled and most flushed into a storm drain. About 50,000 gallons of diluted acid was intercepted and pumped into a holding tank. Remaining pools of the diluted acid were pumped to the CWTP. The acid that was not intercepted or contained discharged to the Housatonic River from Outfall 007. Chromium concentrations of effluent from Outfall 007 were measured at 30 mg/l on May 8, 1978 and 2.5 mg/l on May 10, 1978, and were not detectable by May 11, 1978.

No records of enforcement actions or fines relating to these releases were found during this records search.

DEP Order No. 3644. Issued December 21, 1983 to SAEP to make modifications to OATP in order to bring Outfall 007 into compliance with the NPDES permit by "proper treatment of oily wastewaters." SAEP has reportedly complied with this order.

Consent Decree, Civil Action No. H84 441 MJB. Signed April 10, 1984, resulted from a citizens' suit initiated by the Connecticut Fund for the Environment (CFE) and the

Natural Resources Defense Council, Inc. (NRDC) for violations of permit discharge limitations. SAEP agreed to "use its best reasonable efforts" to achieve compliance with the permit, to complete the upgrading of the CWTP, and to complete several other actions to achieve compliance. The decree was to expire when these actions were completed and CFE and NRDC given written notice of the completion; no written notice was found in the SAEP files.

Records indicate that frequent and severe violations of permit limitations (i.e., effluent concentrations more than 5 times the permit limit) occurred prior to the mid 1980s. Violations have occurred since that time less frequently and with less severity.

5.4.2. Current Regulatory Status

5.4.2.1 Discharge to Sanitary Sewer

No notices of violation or noncompliance were found in the files. According to SAEP's environmental coordinator, SAEP is currently in compliance with the requirements of the permits.

5.4.2.2 Direct Discharge

Although the expiration date for the 1985 permit has passed, it is still in effect until the new permit is finalized by the DEP.

Discharge Monitoring Reports (DMRs) for calendar year 1990 were reviewed and several violations of permit limitations were noted:

- During each month of 1990 except December, the average daily flow limitation of 1,600 gallons for discharge from the CDF was exceeded. A flow of 8,640 gallons per day was entered for each month. The flow and pH data for the CDF discharge were each placed in the other's location on the May DMR. No flow data were reported for the CDF for December.

- During July, the maximum daily concentration limit for total toxic organics (TTO) of 1.0 mg/l was exceeded at Outfall 008 (1.13 mg/l).

- During August, the average daily flow limitation of 1,836,000 gallons was exceeded at Outfall 007 (2,060,000 gallons per day).

- During September, the average daily flow limitation of 190,000 gallons was exceeded at Outfall 008 (191,200 gallons per day).

- During September, the maximum daily concentration limitation for nickel of 2.0 mg/l was exceeded at Outfall 008 (10.53 mg/l); the monthly average concentration limitation for nickel of 1.0 mg/l was also exceeded at Outfall 008 (2.79 mg/l).

- During December, the maximum daily concentration limitation for total cyanide of 0.65 mg/l was exceeded at CDF (5.7 mg/l); the maximum daily concentration limitation for amenable cyanide of 0.32 mg/l was also exceeded at the CDF (5.5 mg/l).

Monitoring for TTOs in 1990 detected the constituents listed in Table 5-1. Methylene chloride, a common laboratory containment, was detected in samples from both outfalls and was assumed to be a laboratory contaminant for these analyses.

From the past regulatory compliance standpoint, the presence of the chemicals listed in Table 5-1 is significant only if the TTO concentration exceeded the permit limitation of 1.0 mg/l. Based on the SAEP records, such an exceedance occurred in July 1990. For present and future compliance, the NPDES permit requires that TTO be less than 1.0 mg/l and that the discharge must not contain chemicals in such concentrations to cause acute or chronic toxicity to specified test organisms.

The presence of these chemicals in the effluent is significant because it is indicative of improper "housekeeping". The chlorinated chemicals detected in effluent likely enter the sewer lines as waste solvents. Since the source of these chemicals is unknown, the treatment plants are not designed to treat chlorinated organics, and monitoring is done infrequently (i.e., monthly), a discharge that is harmful to aquatic life in the receiving water is possible. If a fish kill or other damage to aquatic life was traced to SAEP, SAEP would be held responsible under the Clean Water Act even if a significant spill (i.e., discharge above NPDES permit requirements) was not detected through self-monitoring.

5.4.3 Future Regulatory Status/Issues

5.4.3.1 Stormwater Discharge

SAEP's NPDES permit already addresses discharge of stormwater through Outfalls 001 through 007. SAEP must have any discharge to Frash Pond or the airport added to the permit to remain in compliance. Approval of the group permit application, submitted by TLS on March 18, 1991, would allow SAEP and other Textron facilities with similar operations to operate under the same permit.

5.4.3.2 Draft NPDES Permit/Toxicity Limitations

The draft NPDES permit adds requirements for collection and analysis of effluent samples from Outfalls 007 and 008 for aquatic toxicity. Although the test methodologies are similar, the toxicity limitations for the two outfalls are somewhat different.

The draft permit states that, effective one year after permit issuance, the effluent from Outfall 007 "shall not exhibit acute or chronic toxicity in the receiving waterbody." It later clarifies this by stating that compliance at 007 will be achieved if "no significant mortality" is observed when tested at the instream waste concentration (IWC) for acute protection or the IWC x 20/3 (up to 100 percent) for chronic protection, using methodology outlined in Section 22a-430-3(j)(7)(A) of the DEP regulations.

The draft permit states that, effective at the issuance of the permit, compliance with aquatic toxicity (acute) limitations for Outfall 008 will be achieved if the LC_{50} of the effluent is greater than three times the IWC. Compliance with aquatic toxicity (chronic) limitations for Outfall 008 will be achieved if the LC_{50} of the effluent is greater than twenty times the IWC. The LC_{50} is defined as the concentration that is lethal to 50 percent of the test organisms.

Although most analyses so far have resulted in an LC_{50} of greater than 100 percent (i.e., undiluted effluent was lethal to less than half of the test organisms), the several exceptions should be noted. An undiluted sample collected from Outfall 007 on November 1, 1988 resulted in a 26 percent survival rate for one of the test organisms (Daphnia pulex), possibly related to a higher than normal 1,1,1 trichloroethane concentration (2.4 mg/l). Undiluted samples collected from Outfall 008 on November 1, 1988 and November 17, 1988 resulted in survival rates of less than 50 percent for both test organisms: the Mysid Shrimp survival rate was 38.8 percent for the November 1, 1988 sample and 20.3 percent for the November 17, 1988 sample; the Sheepshead Minnow survival rate was 43.8 percent for the November 17, 1988 sample. The toxicity from the 008 sample was tentatively attributed to high copper concentrations of 1.04 mg/l and 2.14 mg/l (IPC Corporation, 1988).

The Discharge Toxicity Evaluation (DTE) also noted that dye studies indicated rapid dispersion of the Outfall 007 effluent plume and predicted that no toxic effects should result in the receiving water. The dye study indicated that dispersion processes were not as effective at Outfall 008, and the report indicated the possibility of in-stream toxicity (acute and chronic) due to the discharge from this outfall and the possibility that toxicity reduction could be required by DEP.

Another possible issue related to the DTE is the determination of the area of concern for instream toxicity. From the wording of the NPDES permit and the DTE, toxic effects from Outfall 007 would only be considered a problem at the point where the flow leaves the intertidal flats and enters the main part of the Housatonic River. If threatened or endangered species were found in the intertidal flats, this would become the area of concern, and toxicity reduction could be required before discharge (see Section 3.9.3 for discussion at threatened and endangered species).

5.4.3.3 Possible Corrective Actions

If sediments are found to be contaminated to a level where cleanup is required, cleanup could possibly be regulated under CWA. In conversations with DEP, it was apparent that the state would rather pursue a cleanup of contaminated sediments under the CWA than under RCRA or CERCLA where possible, mostly because it can be accomplished quicker, with fewer bureaucratic steps.

5.4.3.4 CWA Reauthorization

The current session of Congress is expected to continue the CWA reauthorization process begun in 1990. Coastal, estuary, wetland, and groundwater protection, as well as control of coastal water sediments, are addressed in the legislation that has been introduced. At this time, it is premature to predict specifically how this would affect SAEP, so this discussion will be limited to a general listing of legislation under consideration that could have some effect on SAEP operations.

The National Estuary Program (NEP), established in the 1987 CWA amendments would be expanded under the new bill. Comprehensive Conservation and Management Plans (CCMP) would coordinate control of pollution from a variety of sources (point-source, non-point-source, soil erosion, etc.) for specific bays and estuaries (Weaver, 1991). This could result in a more in-depth analysis by DEP of water quality and sources of pollution in selected coastal areas, possibly leading to more stringent NPDES permit monitoring and mass discharge limitation requirements. The proposed legislation would also establish a comprehensive regulatory system for controlling sediment quality in coastal regions. It is not known if or how this would apply to the mouth of the Housatonic River.

5.5 CLEAN AIR ACT (CAA)

SAEP is located in the New Jersey-New York-Connecticut Interstate Air Quality Control Region (40 CFR 81.13). Additionally, Connecticut is a designated part of the single transport region for ozone (CAA, section 184.(a)). This Ozone Transport Region (the only one specifically established by the CAA) also includes Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and the Consolidated Metropolitan Statistical Area that includes the District of Columbia.

The Stratford area is included in a severe nonattainment area for ozone (O_3) and a moderate nonattainment area for carbon monoxide (CO).

5.5.1 State/Federal Authority

DEP has been delegated the authority by EPA to implement and enforce most CAA programs, with the exceptions of the acid rain and ozone depletion programs under the 1990 CAA amendments and the radionuclide regulations in National Emission Standards for Hazardous Air Pollutants (NESHAPS, 40 CFR 61). A number of revisions to the Connecticut State Implementation Plan (SIP) will be required by the 1990 amendments.

Although DEP has the lead in enforcing the CAA, the 1990 amendments (PL101-549) enhanced EPA's authority to initiate enforcement actions if it determines that the state has not initiated an enforcement in a timely manner (within 30 days after the notice of violation for an SIP violation or within 90 days for a permit violation). This can include a compliance order, an enforcement order, or a civil action with a maximum penalty of $25,000 per day per violation. Violations of NESHAPS requirements could also lead to criminal action, including a fine and imprisonment (CAA, Section 113). The amendments also provide, at CAA Section 113(f), for the award of up to $10,000 to any person who provides information leading to the criminal conviction for violations of Titles I, III, IV, V, or VI of the CAA.

Because of the significant and extensive revisions to the CAA, and the revisions to the SIP that it requires, special attention should be paid to the permit, air toxics, and enforcement requirements. A summary of the requirements of the revised CAA can be found in The Hazardous Waste Consultant (January/February 1991).

5.5.2 Compliance History

5.5.2.1 Permits

Permits under the CAA are issued for individual emission sources. For example, each test cell stack would have its own permit or registration. (Note that not all emission sources would require a permit, although they would still be subject to the CAA and applicable emission limitations. Several examples would be air vents and fugitive dust sources, which would be subject to particulate emission limitations.)

Permits are required and have been obtained for a number of sources at SAEP, including engine test cells, boilers, and plating lines. A review of SAEP records indicates that the required permits have not always been obtained as required when emission sources were constructed or modified.

5.5.2.2 Inspections

SAEP is inspected annually by DEP. SAEP must first complete a pre-inspection questionnaire and submit it to DEP; the inspection consists of an on-site visit by a DEP inspector to confirm information contained in the questionnaire.

Inspection reports indicate occasional violations of CAA requirements such as: fumes escaping from vapor degreasers; failure to notify DEP of modifications to or additions of processes that could increase emissions; and excess emissions of chromic acid. SAEP was determined to be in compliance with chromic acid emission requirements and appears to be in compliance with other CAA requirements except as noted in Section 5.5.3.

5.5.3 Current Regulatory Status

5.5.3.1 Asbestos Emissions

A consent decree was sent to TLS on May 10, 1990 for violations of the National Emission Standards for Hazardous Air Pollutants (NESHAPS) requirements for asbestos. This consent decree references a complaint which was not found in SAEP's files during this record search.

SAEPs Health and Safety Officer reported that monthly air monitoring for asbestos is currently being done in a hallway between B-1 and B-2 because of a worker complaint. To date, no detections of asbestos fibers in the air of this area have been made.

According to SAEPs Environmental Coordinator, TLS is in compliance.

5.5.3.2 Radionuclide Emissions

New NESHAPS regulations set limits on the emissions of radionuclides (40 CFR 61, Subpart I, effective July 13, 1990) from facilities holding NRC licenses. These regulations would apply to emission points (such as ventilation system exhausts) from areas where thorium alloy are machined or any other area where thorium dust could be generated. Emissions to the ambient air cannot exceed an amount that would result in a member of the public receiving an effective dose equivalent of 10 mrem/yr in any year (40 CFR 61.102).

No information was found in the files to indicate whether the emission rates have been determined; however, dust is collected in the areas of SAEP where thorium dust is expected to be generated, and the air is monitored, so it should be possible to make an estimate of emissions (see Section 4.9).

5.5.4 Future Regulatory Status/Issues

The CAA amendments of 1990 (Part D, Subpart 2) specifically address ozone nonattainment areas by setting classification and attainment dates, SIP revision requirements, and enforcement measures for severe and extreme ozone nonattainment areas that fail to attain the primary national ambient air quality standard for ozone. After December 31, 2000, "major stationary sources" (emissions of more than 25 tons/year) for VOC emissions will be subject to a yearly fee of $5,000 per ton of VOCs emitted during the calendar year in excess of the baseline amount until the area is reclassified as an attainment area. SAEP is located in a severe nonattainment area for ozone. SAEP must determine whether it is in the category of "major stationary source" for VOC emissions, in order to determine whether it is subject to the $5,000 per ton fee. The same provisions that apply to major stationary sources for VOCs also apply to major stationary sources of oxides of nitrogen (NO_x) in severe nonattainment areas. Therefore, SAEP must also determine whether it is a major stationary source of NO_x because of emissions from sources such as engine test cells.

In severe ozone nonattainment areas, employers of 100 people or more will be required to increase passenger occupancy per vehicle by 25 percent for work-related trips, including commuting between home and the workplace (CAA, Section 182[d]). This requirement must be added to state implementation plans by November 15, 1992.

Section 233 of PL 101-549 requires the EPA Administrator and the Secretaries of Transportation and Defense to "commence a study and investigation of the testing of uninstalled aircraft engines in enclosed test cells that address at a minimum the following issues and such other issues as they shall deem appropriate:

(1) whether technologies exist to control some or all emission of oxides of nitrogen from test cells

(2) the effectiveness of such technologies

(3) the cost of implementing such technologies

(4) whether such technologies affect the safety, design, structure, operation, or performance of aircraft engines

(5) whether such technologies impair the effectiveness and accuracy of aircraft engine safety design, and performance tests conducted in test cell

(6) the impact of not controlling such oxides of nitrogen in the applicable nonattainment of areas and on other sources, stationary and mobile, on oxides of nitrogen in such areas."

The report on this study must be submitted within 24 months of the enactment of the amendments. After submission of the report, the states may develop and enforce regulations for controlling emissions from engine test cells.

Because of the voluminous and significant changes made to the CAA in 1990, SAEP should determine whether the CAA now applies to previously unregulated sources, whether it will be able to comply with new requirements for previously regulated sources, and take steps to apply for any new permits that may be required by the amendments.

5.6 TOXIC SUBSTANCES CONTROL ACT (TSCA)

5.6.1 State/Federal Authority

The two main groups of substances presently regulated under TSCA are asbestos and PCBs. Presently, TSCA only regulates asbestos-related activities in schools; therefore, this section of the act does not apply to SAEP. This act affects SAEP through regulation of PCB and PCB-containing electrical equipment, such as transformers.

5.6.2 Compliance History

EPA Consent Agreement and Order, TSCA Docket No. 84-1006. Signed February 8, 1984 in response to findings that SAEP failed to maintain adequate inspection and maintenance records for 20 PCB transformers. SAEP agreed to subsequently ensure that transformers would be inspected and that records of inspections and maintenance history of the transformers would be maintained.

5.6.3 Current Regulatory Status

SAEP appears to be in compliance with the requirements of the regulations and the consent agreement.

5.6.4 Future Regulatory Status/Issues

No future issues were identified beyond the continuing inspection and maintenance requirements.

5.7 SAFE DRINKING WATER ACT (SDWA)

5.7.1 State/Federal Authority

Federal facilities must comply with the SDWA except where a Presidential waiver is determined to be necessary for purposes of national security. Section 1449 provides for citizen suits against federal facilities in cases of noncompliance.

The SDWA primarily applies to owners and operators of public water supply systems. SAEP buys its water from the Bridgeport Hydraulic Company, and is therefore not subject to most SDWA requirements. The section of the SDWA that does apply to SAEP is Section 1417, prohibiting use of lead pipes, solder, and flux in any plumbing in residential or nonresidential facilities connected to a public water system after the effective date of the 1986 SDWA amendments.

5.7.2 Compliance History

No indication was found in the SAEP files to indicate any past compliance problems related to the requirements of this Act.

5.7.3 Current Regulatory Status

Available information indicates that SAEP is in compliance with the requirements of the SDWA.

5.7.4 Future Regulatory Status/Issues

No future issues were identified.

5.8 FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA)

5.8.1 State/Federal Authority

The EPA, through FIFRA, regulates the registration of pesticides, registration of pesticide manufacturing facilities, use of pesticides, and certification of pesticide applicators.

5.8.2 Compliance History

No information was found in the SAEP files to indicate any past compliance problems related to the requirements of this Act.

5.8.3 Current Regulatory Status

Current regulatory status could not be determined from information in SAEP files. Pesticide application is subcontracted, and no storage or application records were found in the files.

5.8.4 Future Regulatory Status/Issues

Because of the lack of available information, future regulatory status could not be evaluated.

5.9 NOISE CONTROL

5.9.1 State/Federal Authority

The State of Connecticut regulates noise pollution through the Connecticut Noise Pollution Act and the Connecticut Noise Control Regulations. Federal authority is stated in the Noise Control Act of 1972.

5.9.2 Current Regulatory Status

Results of the most recent Installation Compatible Use Zone (ICUZ) study (Avco and SAEP, 1985) indicated that several off-base areas were within the Zone III contour, where the average annual day-night sound level (Ldn) exceeded 75 dBA. Modifications to engine testing schedules and to the test cells have been made since 1985, but a new ICUZ study has not been completed to determine the effects of these modifications on the noise zones.

Several land uses, including schools, residential housing, and hospitals, would be considered incompatible uses in Zone II (Ldn greater than 70 but less that 75) and Zone III areas. Army policy stipulates that all Zone III areas are to fall within the boundaries of the Army installation (Avco and SAEP, 1985).

Current regulatory status could not be determined from available information; however, it appears that another ICUZ study should be made to determine the effects of noise-reduction modifications currently being implemented at SAEP.

5.9.3 Future Regulatory Status/Issues

The ICUZ study needs to be updated to reflect changes in the operations and facilities at SAEP. The future regulatory status depends on the redefined noise contours, the frequency and seriousness of complaints from the public, and the degree of cooperation with the local planning authorities, which would help to prevent the further development of noise-sensitive uses within the Zone II and III contours.

5.10 ENDANGERED SPECIES

5.10.1 State/Federal Authority

The Connecticut Endangered Species Law (Volume 8, Section 26, Chapter 495 of the Connecticut General Statutes) was passed in 1989. This law establishes a program to protect threatened and endangered species (T&E). Under this program, the DEP "may conduct studies of wildlife and plants to better understand their distribution, population, habitat needs, and the limiting factors which" would determine the protection necessary to sustain the population. The DEP maintains a database for locations of threatened and endangered species. This database was one of the sources of T&E information presented in Section 3.8.3.

USFWS is the federal agency responsible for implementation of the Endangered Species Act (ESA) of 1973. Two of the main purposes of the ESA are to conserve T&E species and to conserve the ecosystems that support these species. Under the ESA, federal agencies must ensure that "any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species," unless the agency is granted an exemption. The identification of endangered species and the effect of an action on them would normally be carried out as part of the environmental impact analysis process under the National Environmental Policy Act (NEPA).

5.10.2 Compliance History

A complete determination could not be made of compliance with the ESA. No record were found of any site-specific field investigations at SAEP and no information on NEPA assessments regarding T&E species was found in the SAEP environmental files.

5.10.3 Current Regulatory Status

No threatened or endangered plant or animal species have been identified on SAEP by the DEP; however, the piping plover may forage in the intertidal flats located within SAEP's riparian rights. Threatened and endangered species identified within 2 miles of SAEP are listed in Section 3.8.3.

5.10.4 Future Regulatory Status/Issues

RCRA or CERCLA cleanup actions would require detailed assessments of possible impacts to endangered species from the proposed actions, whether the species are on SAEP property or neighboring property.

5.11 RADIOACTIVE MATERIALS

5.11.1 Federal Authority

5.11.1.1 Nuclear Regulatory Commission (NRC)

An NRC materials license was issued to AVCO Lycoming Textron on September 18, 1987, for possession and use of thorium. A maximum amount of 2,300 kilograms of thorium may be possessed at any one time at this facility. The thorium is in the form of thorium alloy (not more than 4 percent thorium by weight). Radioactive waste is not to be stored for more than two years before shipment. The license expired on March 31, 1990, and SAEP is operating under the old permit while the NRC is processing the application for permit renewal submitted by SAEP on February 8, 1990.

NRC Standards for Protection Against Radiation are contained in 10 CFR 20 and include regulations regarding permissible doses and concentration, precautionary procedures, waste disposal, required reports and notifications, and enforcement.

5.11.1.2 Environmental Protection Agency

The EPA regulates radiation and radioactive materials in several areas, including radionuclide emissions to the air (40 CFR 61, regulations on NESHAPS under the Clean Air Act, effective March 15, 1990) from facilities licensed by the NRC, radionuclides in drinking water (40 CFR 141), radiation protection for the general public from nuclear power operations (40 CFR 190), radiation protection standards for managing spent nuclear fuel (40 CFR 191), and protection against uranium mill tailings (40 CFR 192).

Apparently, the only EPA regulations that apply are the NESHAPS regulations that regulate the emissions of radionuclides, which became effective in 1990. This subject was discussed in Section 5.3.2 of this report, concerning compliance with the Clean Air Act. Emissions to the ambient air cannot exceed an amount that would result in a member of the public receiving in any year an effective dose equivalent of 10 mrem/yr (40 CFR 61.102).

5.11.2 Compliance History/Current Regulatory Status

No letters of warning or evidence of other compliance action concerning the NRC license were found in SAEP files.

The NRC inspected SAEP in late March 1991; its findings have not yet been reported. Findings of this inspection could have a bearing on renewal of the permit and conditions placed in the permit.

5.11.3 Future Regulatory Status/Issues

SAEP will have to determine whether it is in compliance with the Clean Air Act regulations for emissions of radionuclides.

5.12 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

5.12.1 Federal Authority

NEPA requires that all federal government agencies evaluate the environmental impact of actions proposed by that agency. NEPA required federal agencies to adopt systematic approaches to: ensure that environmental considerations relating to an action would be taken into account along with the economic and technical considerations; prepare reports to document the environmental impacts of the actions and possible alternative actions; and provide the report to the appropriate federal, state, and local agencies, and to the public.

The process generally involves a preliminary study to determine whether the action fits one of the "categorical exclusions" which would exempt it from the requirement for further study. If further study is required, the subsequent environmental assessment results in either a finding of no significant impact (FONSI), requiring no further action, or a finding that a detailed environmental impact statement (EIS) must be prepared.

5.12.2 Compliance History/Current Regulatory Status

SAEP does not appear to be in compliance with the requirements of NEPA, i.e., there was no record that environmental evaluations have been conducted prior to beginning construction projects since the Act was enforced in 1970. No information was available indicating that any site-specific field studies have been conducted at SAEP to detect the presence of endangered plant or animal species and to assess the effects of SAEP activities (such as construction) on them.

5.12.3 Future Regulatory Status/Issues

Any proposed federal actions at SAEP, including construction or transfer of property, should be evaluated for compliance with NEPA requirements.

TABLE 5-1
CHEMICALS DETECTED IN EFFLUENT DURING 1990

OUTFALL AND CHEMICAL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Outfall 007												
Chloroethane, μg/L	ND	14.1	ND	ND	ND	ND	15.1	ND	ND	ND	ND	NR
Vinyl Chloride, μg/L	ND	1.3	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,1 Dichloroethane, μg/L	69.6	30.5	NR	ND	ND	ND	10.5	ND	ND	ND	ND	NR
Trans-1,2-Dichloroethene, μg/L	67.3	41.5	NR	ND	ND	ND	ND	ND	13.2	ND	32.8	NR
Chloroform, μg/L	12.9	ND	NR	30.2	27.5	17.0	17.5	20.3	21.1	31.1	ND	NR
1,1,1-Trichloroethane, μg/L	450	310	390	390	240	39	32	50	176	40	180	119
Trichloroethene, μg/L	7.5	1.0	NR	2.3	ND	ND	1.1	ND	3.6	ND	ND	NR
Outfall 008												
Chlorobenzene, μg/L	ND	ND	14.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, μg/L	ND	ND	152	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene, μg/L	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene, μg/L	2.0-2.9	4.1-4.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform, μg/L	11.2-40.1	8.7-11.2	1.1-45.0	7.8-41.6	20.1-35.6	7.0-11.2	16.0-52.8	9.0-27.2	11.1-37.2	6.2-24.4	7.3-11.3	3.9
1,1,1-Trichloroethane, μg/L	96.8-346	47.2-162	26.0-132	2.9-422	103-287	7.1-38.5	37.7-420	18.1-73.9	20.2-40.5	1.8-73.3	26.5-84.6	14.6
Bromodichloromethane, μg/L	5.4-17.8	1.0	1.1-2.9	8.4-11.2	3.0-9.1	ND	9.9	1.0-6.0	5.4-6.0	4.6	6.3	2.0
Trichloroethene, μg/L	42-130	88.7-136	39.0-55.9	1.2-36.0	75.1-174	8.3-38.2	13.5-59.3	9.4-35.7	3.0-24.1	9.7-99.6	20.9-80.5	22.3
Dibromochloromethane, μg/L	4.9	1.7	ND	2.2-2.5	ND	ND	1.3	ND	ND	ND	ND	ND
Bromoform, μg/L	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene, μg/L	1.0-1.8	1.2-1.7	1.3	ND	ND	ND	ND	ND	ND	ND	1.2	ND
Total Toxic Organics, mg/L	0.511	0.317	0.397	0.913	0.499	0.06	1.13	0.12	0.076	0.139	0.2	0.1

NR = No Report
ND = Not Detected

6.0
AREAS OF POTENTIAL ENVIRONMENTAL CONCERNS

This section identifies the areas of SAEP property where there is potential for environmental contamination resulting from past operational and waste disposal practices. A summary of known or potential environmental impacts caused by each identified area is also provided.

A total of eight areas of potential environmental concern have been identified for the SAEP property (see Figure 8-1). These areas of concern were selected based on: SAEP's environmental setting; historical development of the site; plant operations within the area; chemicals used or stored in the area; evidence of impact based on former remedial measures (such as removal actions or studies); reports of on-site disposal or releases; and compliance history. These subjects were discussed in detail in Sections 3.0 through 5.0 of this report.

Summaries of each area of potential environmental concern are given in Tables 6-1 through 6-8. These summaries provide: site descriptions; site types, site histories and operational activities; materials/wastes used, generated, or potentially deposited; the physical, chemical, toxicological, migration, and dispersal characteristics of such materials or wastes; the potential for impact; and evidence of impact. Photodocumentation of each area of potential environmental concern, completed during site reconnaissance, is contained in Appendix A.

TABLE 6-1
SUMMARY OF AREA 1 - INTERTIDAL FLATS

SITE SURVEY SUMMARY

Site Description:
48.5 acres of intertidal flats adjacent to Housatonic River (see Figure 8-1, and Appendix A photographs 1-1 through 1-10).

Site Type:
Runoff and effluent depositional area.

Site History/Operations:
Area 1 is not an operational area of the site. Area 1 received untreated runoff and effluent from portions of SAEP between 1929 and 1976. Since 1976, Area 1 has received treated runoff and effluent, with occasional untreated discharges during storm events. Copper, oil, and trichloroethane are present intermittently or continuously in effluent.

MATERIALS/WASTES POTENTIALLY DEPOSITED

Materials/Waste(s):
Heavy metals; Cyanide; Fuel and Oil; Solvents

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Cyanide	-	High water solubility; toxic, noncarcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
PCBs	-	Low water solubility; toxic, carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Cyanide	-	High mobility; nonpersistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
PCBs	-	Low mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
If metals, semivolatiles, or PCBs have been in effluent or runoff from SAEP, there would be potential for such contaminants to accumulate in intertidal flats sediments. Presence of these contaminants could result in toxic conditions for benthic organisms and shellfish; in addition, PCBs and mercury bioaccumulate in aquatic organisms. Potential pathways to humans include dermal/ingestion if direct contact is made with contaminated sediments, or by ingestion of contaminated fish or shellfish.

Evidence of Impact:
Shellfishing in the Housatonic River is highly restricted because of water quality concerns associated with numerous industrial and municipal discharges to the river; however, there is currently no direct evidence of impact from this site.

TABLE 6-2
SUMMARY OF AREA 2 - CAUSEWAY

SITE SURVEY SUMMARY

Site Description:
2.1-acre causeway that extends about 1,000 feet into intertidal flats (see Figure 8-1, and Appendix A photographs 2-1 through 2-6).

Site Type:
Landfill and fire training area.

Site History/Operations:
Area 2 is not currently an operational area of the plant. The causeway was constructed in the early 1930s, and used to launch seaplanes for about 10 years; no records were found to indicate the original fill source. Additional landfilling on the north side of the causeway was done in the 1950s and 1960s, with some asbestos containing materials reportedly disposed of in the landfilled area. The causeway was used in the 1950s and 1960s for fire training exercises. B-59 was constructed in 1968 to store explosives; but no explosives are currently used or stored on site.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Asbestos; Burning residuals; Unknown fill

Physical/Chemical/Toxicological Characteristics:

Asbestos	-	Friable or nonfriable; readily airborne if friable, carcinogenic.
Heavy Metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Asbestos	-	High mobility if friable and exposed to wind; persistent.
Heavy Metals	-	Low to high mobility; precipitates and accumulates; persistent.
Semivolatiles	-	Low to medium mobility, accumulates; persistent.

Potential for Impact:
Some potential for airborne release of asbestos fibers if material becomes exposed at the surface, which could result in human inhalation concerns. Low potential for accumulation of PAHs in soil, which could result in direct contact.

Evidence of Impact:
None.

TABLE 6-3
SUMMARY OF AREA 3 - SHORELINE FILL AREA

SITE SURVEY SUMMARY

Site Description:
13.6 acres of the site adjacent to intertidal flats of Housatonic River (see Figure 8-1, and Appendix A photographs 3-1 through 3-28).

Site Type:
Storage, disposal, and treatment area.

Site History/Operations:
The eastern side of Area 3 was hydraulically filled in 1943 using dredgings from the Housatonic River. This area has been used to test engines and components, store fuel, oils, and wastes, and blend oils. The Oil Abatement Treatment Plant has operated in this area since 1976.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Fuel and Oil; Solvents; Paints

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
PCBs	-	Low water solubility; toxic, carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
PCBs	-	Low mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
The potential for impact is reduced because Area 3 is covered with buildings or pavement, and there are no domestic groundwater users. High potential for direct contact with contaminants (if present) during intrusive activities such as trenching. Some potential for contaminant migration and subsequent discharge to sediments and surface water in intertidal flats.

Evidence of Impact:
Paint-contaminated and petroleum-contaminated soils were encountered during excavations for B-65; contaminated soil was excavated to the low tide level. Petroleum and solvent contaminated soils near B-19 were removed. Drains under B-16 have been corroded by chlorinated solvents, and a study of the tank storage area south of B-16 has indicated the presence of petroleum.

TABLE 6-4
SUMMARY OF AREA 4 - PLATING AND MANUFACTURING AREA

SITE SURVEY SUMMARY

Site Description:
8.7 acres in central portion of plant, including portions of B-2 and B-3, and B-10 and B-12 (see Figure 8-1, and Appendix A photographs 4-1 through 4-19).

Site Type:
Disposal and uncontrolled release area.

Site History/Operations:
Area 4 has been an operational area of SAEP since 1929. In the 1930s, the alleyways were used for USTs and for aboveground storage of paints and solvents. Since the 1940s, fuel tanks have been located in the alleyway to serve the boiler room in B-2. Plating operations and associated solvent cleaning have been done since 1951 in B-2 and B-3; plating ceased in B-3 in the mid 1970s. Engine cleaning was also done in the northwest corner of B-3. B-10 was formerly a service building, but is now used to manufacture recuperators. B-12 has been a maintenance shop since 1941.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Cyanide; Fuel and Oil; Solvents; Paints

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Cyanide	-	High water solubility; toxic, noncarcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Cyanide	-	High mobility; nonpersistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
The potential for impact is reduced because Area 4 is covered with buildings or pavement, and there are no domestic groundwater users. High potential for direct contact with contaminants (if present) during intrusive activities such as trenching. Some potential for contaminant migration and subsequent off-site discharge to sediments and surface water.

Evidence of Impact:
During dewatering for construction of B-70 in 1986, the groundwater reportedly turned "greenish-blue" after considerable pumping. Groundwater collected from old monitoring wells on the west side of B-3 reportedly had detectable levels of chlorinated hydrocarbons.

TABLE 6-5
SUMMARY OF AREA 5 - BUILDING 2

SITE SURVEY SUMMARY

Site Description:
18.8 acres of the plant, around and under most of B-2 (see Figure 8-1, and Appendix A photograph 5-1).

Site Type:
Disposal and uncontrolled release area.

Site History/Operations:
Area 5 includes most of B-2, which was originally constructed in 1929 and had major additions in 1942 and 1944. Operations at Area 5 include aircraft assembly in the 1930s and 1940s, and engine manufacturing from the 1950s to present (plating and heat treating areas of B-2 are excluded from Area 5).

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Fuel and Oil; Solvents; Paints

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
The potential for impact is reduced because Area 5 is covered with buildings or pavement, and there are no domestic groundwater users. High potential for direct contact with contaminants (if present) during intrusive activities such as excavating for foundations. Some potential for contaminant migration and subsequent offsite discharge to sediments and surface water.

Evidence of Impact:
One reported case of cinders and ash, apparently from former on-site incinerator, during foundation excavation inside B-2.

TABLE 6-6
SUMMARY OF AREA 6 - RESEARCH AND DEVELOPMENT AREA

SITE SURVEY SUMMARY

Site Description:
3.9 acres of the plant, including B-3A, B-4, and the northern portion of B-3 (see Figure 8-1, and Appendix A photograph 6-1).

Site Type:
Disposal and uncontrolled release area.

Site History/Operations:
Area 6 has been operational since 1944. This area houses much of the plant's research and development activities, including a materials testing laboratory.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Fuel and Oil; Solvents

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
The potential for impact is reduced because Area 6 is covered with buildings or pavement, and there are no domestic groundwater users. High potential for direct contact with contaminants (if present) during intrusive activities such as excavating for trenches. Some potential for contaminant migration and subsequent offsite discharge to sediments and surface water.

Evidence of Impact:
None.

TABLE 6-7
SUMMARY OF AREA 7 - TESTING AREA

SITE SURVEY SUMMARY

Site Description:
5.5 acres in the southeast part of the plant, including B-6, B-17, and B-72 (see Figure 8-1, and Appendix A photographs 7-1 through 7-7).

Site Type:
Disposal and uncontrolled release area.

Site History/Operations:
Area 7 includes B-6, which was constructed in 1944 and used as an experimental hangar. Since the 1950s, B-6 has been used for experimental (high altitude) engine testing. B-17, the steam generating plant, was constructed in 1952 and has some storage of fuel oils. Fuels have been stored in the area of B-72 since the early 1960s.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Fuel and Oil; Solvents

Physical/Chemical/Toxicological Characteristics:

Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
The potential for impact is reduced because Area 7 is covered with buildings or pavement, and there are no domestic groundwater users. High potential for direct contact with contaminants (if present) during intrusive activities such as excavating for foundations. Some potential for contaminant migration and subsequent offsite discharge to sediments and surface water.

Evidence of Impact:
During excavation for lagoon closure, petroleum-contaminated soils were reportedly observed in the area of B-72, but they were not removed.

TABLE 6-8
SUMMARY OF AREA 8 - DRAINAGE DITCH

SITE SURVEY SUMMARY

Site Description:
Off-site drainage ditch that flows into the Marine Basin (see Figure 8-1, and Appendix A photographs 8-1 through 8-4).

Site Type:
Runoff and effluent depositional area.

Site History/Operations:
This drainage ditch has received treated effluent from the chemical waste treatment plant since 1958.

MATERIALS/WASTES USED OR GENERATED

Materials/Waste(s):
Heavy metals; Cyanide; Oil; Solvents

Physical/Chemical/Toxicological Characteristics:

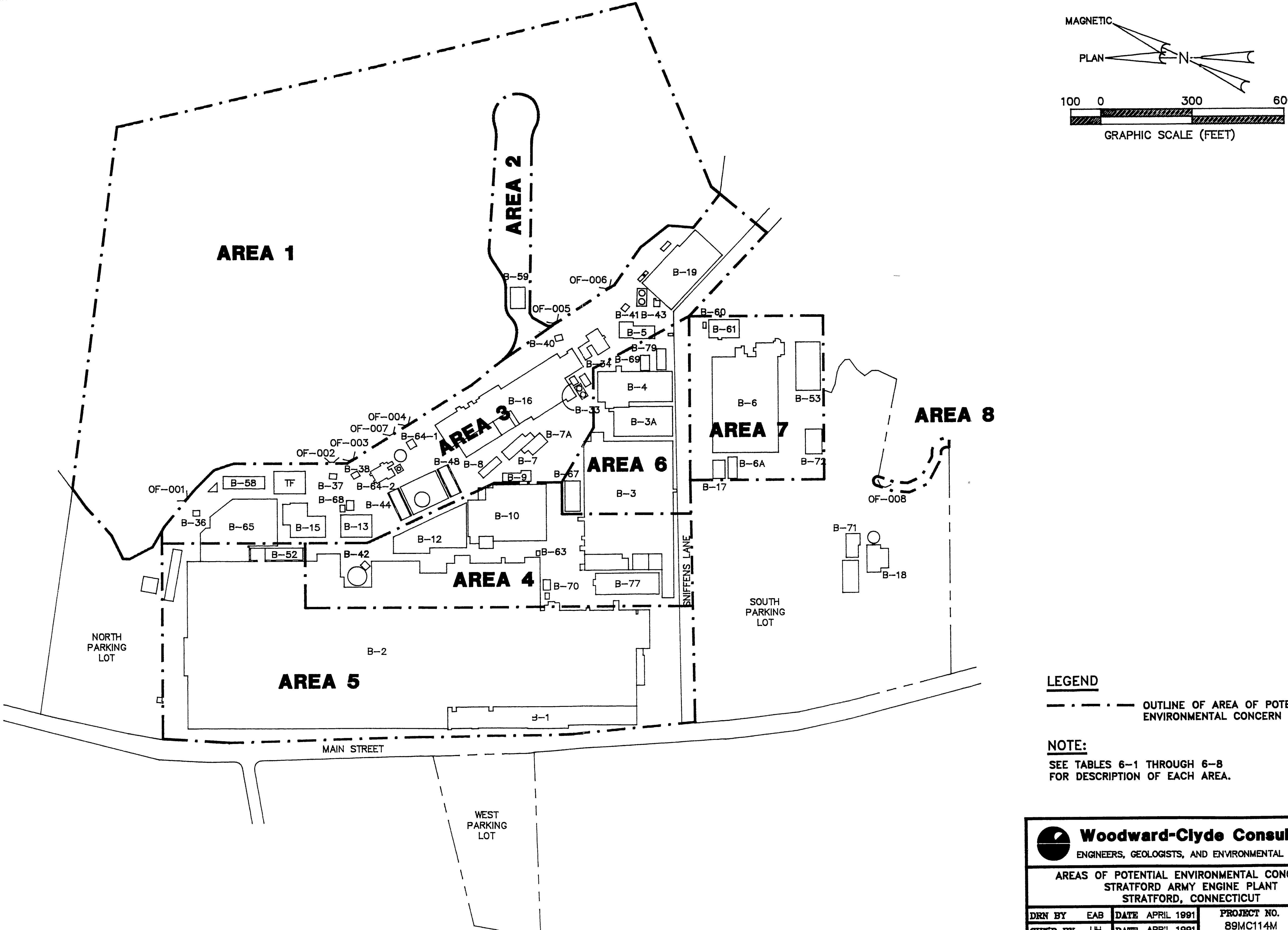
Heavy metals	-	Low to medium water solubility; toxic, cadmium and hexavalent chromium are carcinogenic.
Cyanide	-	High water solubility; toxic, noncarcinogenic.
Semivolatiles	-	Low to medium water solubility; toxic, some are carcinogenic.
PCBs	-	Low water solubility; toxic, carcinogenic.
Volatiles	-	Medium to high water solubility; toxic, some are carcinogenic.

Migration and Dispersal Characteristics:

Heavy metals	-	Low to high mobility; precipitates and accumulates; persistent.
Cyanide	-	High mobility; nonpersistent.
Semivolatiles	-	Low to medium mobility; accumulates; persistent.
PCBs	-	Low mobility; accumulates; persistent.
Volatiles	-	Medium to high mobility, readily volatilizes; low to nonpersistent.

Potential for Impact:
High potential for accumulation of metals, semivolatiles, and PCBs in ditch sediments if these contaminants are/were in runoff/effluent from SAEP. Presence of these contaminants could result in toxic conditions for benthic organisms; in addition, PCBs bioaccumulate in aquatic organisms. Potential pathways to humans include dermal/ingestion if direct contact is made with contaminated sediments, or by ingestion of contaminated fish or shellfish.

Evidence of Impact:
Monitoring indicates occasional presence of chlorinated hydrocarbons and heavy metals in effluent discharged to the drainage ditch.



LEGEND

— · — · — OUTLINE OF AREA OF POTENTIAL ENVIRONMENTAL CONCERN

NOTE:

SEE TABLES 6-1 THROUGH 6-8 FOR DESCRIPTION OF EACH AREA.

Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY	EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
CHK'D BY	JJH	DATE APRIL 1991	89MC114M	6-1

7.0
HUMAN POPULATIONS

The Greater Bridgeport Regional Planning Agency's population census of Stratford was 49,389 people for 1990. Slow population growth has been a trend in Stratford for nearly two decades, and the Connecticut Office of Policy and Management anticipates a continued slow or declining growth rate for Stratford through the end of the century with a population projection of 48,650 for the year 2000, and 45,800 for the year 2010 (Stratford Planning and Zoning Commission, 1990).

In Stratford, the age of the population is decidedly older than the state average. The town's median age in 1980 was 38.2, compared to 32 for the State of Connecticut. The Connecticut Office of Policy and Management anticipates the median age of Stratford to be 45.7 by the year 2010. Nearly 23 percent of Stratford's population had reached age 60 by 1980, compared to the state average of 17 percent.

The population of Stratford represents various races and nationalities. Over 8 percent of the 1980 population in Stratford was nonwhite. This compares closely to a nonwhite population of 9.9 percent for the State of Connecticut (Town of Stratford, 1989).

The work force at SAEP is currently made up of about 3,900 workers of which approximately one-half are "white-collar" and one-half are "blue-collar" (TLS, 1991). Over the past 10 years, the work force population has varied from about 5,100 in 1982 to the current 3,900. According to interview information, the plant is expected to maintain about the current number of workers into the foreseeable future.

SAEP is located about 3/4-mile southeast of Johnson Junior High School and Birdseye School. The numbers of students at each school was not identified by this study. SAEP is located about 1/2 mile northwest of Short Beach Park which had over 80,000 users reported for the year 1991. There are several businesses located west of Main Street, across from SAEP, including a small strip mall, several gas stations, and a restaurant.

The numbers of workers or customers at these businesses was not identified by this study.

Access into the plant is highly restricted with a perimeter fence and security guards. However part of the Boaters, fishermen, and shell fishers could, however, potentially access unrestricted intertidal flats within SAEP property.

8.0
EXPOSURE ASSESSMENT

8.1 CONCEPTUAL MODELS

This section presents and discusses conceptual models that were developed for each of the sites of environmental concern identified at SAEP. Based on information currently available, the conceptual models identify known or suspected sources of contamination, release mechanisms, transport media, potential exposure pathways, and potential human and biota receptors. Each model provides the basis and/or identifies information that will be needed for development of a baseline exposure assessment, which is an evaluation of the potential threat to public health and the environment in the absence of any remedial action at a site. Potential contaminant sources and pathways need to be identified early in the process so data needs can be identified. Potential migration pathways at SAEP include soil/sediment, groundwater, surface water, and air.

Known or suspected sources, potential pathways, and possible receptors (human and biota) are discussed on an area-by-area basis in the following sections.

8.1.1 Area 1 - Intertidal Flats

The conceptual model for Area 1 is presented in Figure 8-1. Although hazardous compounds were not handled or generated in this area, it is a depositional area that may have received hazardous compounds from past discharge and/or runoff from SAEP as well as from areas located upstream on the Housatonic River. Contaminants of concern that may have been received from the SAEP include: heavy metals, cyanide, PCBs, semivolatile organic compounds (semi-VOCs) and volatile organic compounds (VOCs). The heavy metals, PCBs, and semi-VOCs may have accumulated in the sediment within the intertidal flats from the time the plant started in operation in 1929 until 1976 when the OATP was installed. Since 1976, movement of contaminants from SAEP into this area would have been limited to levels that have been identified in the effluent and during periods of heavy precipitation when surface runoff has been discharged directly to the river without going through the treatment plant.

Presently, it is believed that contaminated media are confined primarily to sediments within the intertidal flats. As shown on Figure 8-1, there is a potential pathway from the contaminated media (sediment) to human and/or biota receptors. Neither groundwater nor surface water are considered to be primary pathways because the movement of tidal flow into and out of the area would prevent build up of contaminants in the surface water and there are no known users of groundwater. When the intertidal flats are exposed during low tides, there is a slight possibility that volatiles (if any) present in the sediment could be released to the air pathway. One primary pathway is the dermal contact of human and biota with contaminated sediment. Another primary pathway would also include the ingestion of sediment by biota (possible incidental ingestion by humans) and the consumption of contaminated organisms (shellfish, fish, etc.) by people and/or other biotic organisms (fish, birds, etc.). Other potential pathways include direct contact with the effluent or air emissions from the effluent. Presently, it is not known if any of these pathways are complete.

Potential, present, and future human receptors would be limited to SAEP workers that may work along the intertidal flat shoreline and the public that may use the area. Secondary receptors would include people who may consume shellfish that were obtained from this area. Presently, recreational harvest of shellfish within the Housatonic River is highly regulated (controlled) because of water quality concerns. Therefore, use of the area by people and/or the consumption of shellfish from the area should not represent a major exposure pathway.

Biota receptors would include dermal exposure to shellfish, benthic insects, and bottom-dwelling finfish. Secondary biological receptors would include finfish and birds who feed on contaminated organisms that occur in the area.

Again, it should be noted that presently it is not known if contaminant of concern are present in the intertidal flats. If contamination does not exist, than no pathways exist and no potential receptors would be affected.

8.1.2 Area 2 - Causeway

Area 2 has been used for fire training area and a landfill area including the possible disposal of asbestos containing material. Figure 8-2 presents the conceptual model for Area 2. Contaminants of concern include asbestos and polynuclear aromatic hydrocarbons (PAHs) that may be residual from the fire training area.

As shown on Figure 8-2, contaminated media would be limited to soils within the causeway. Potential pathways include contamination of surface water during precipitation events, and movement of asbestos fibers and/or contaminated dust particles by the wind.

Presently, human receptors for this area would include those SAEP workers whose duties take them onto the causeway. It is also possible that fishermen could access the causeway. Exposure routes to humans would include ingestion, inhalation, and dermal contact. Biota receptors would be limited to terrestrial animals and birds who may feed along the shore or use the area for a resting area.

Additional data are needed to establish the present or absence of contaminants of concern within this area.

8.1.3 Area 3 - Hydraulic Fill Area

The conceptual model for Area 3 is presented in Figure 8-3. This area has been used to store, treat, and dispose of materials used at SAEP including metals, fuels, oils, and solvent; thus, contaminants of concern include: heavy metals, PCBs, semi-VOCs, and VOCs. These chemicals may have contaminated soils and/or groundwater from past disposal or uncontrolled releases (spills and/or leaks).

Since most of the area is paved or occupied by buildings, potential pathways to human and/or biota receptors are quite limited. Presently, surface water and air pathways do not exist and groundwater does not represent a completed direct pathway because there is no domestic use of the groundwater in the vicinity of SAEP. Groundwater may be a pathway if contaminants migrated in groundwater and discharged to sediments and surface water. The primary pathway to human receptors would be during intrusion activities within areas with contaminated soils. The primary pathway for biota receptors would be the groundwater/sediment interface.

Potential human receptors would be primarily limited to workers at SAEP involved with intrusion activities within areas of contaminated soils. Potential exposure routes to the workers would include ingestion, inhalation, and dermal contact. Potential biota receptors would include organisms that live in the sediment where the groundwater/sediment interface which is probably the intertidal flats. More information is needed to define groundwater movement patterns, potential areas of groundwater discharge, and extent of soil contamination.

8.1.4 Area 4 - Plating and Manufacturing Area

Figure 8-4 provides the conceptual model for Area 4. This area has been in operation since 1929, and has housed the plating operation since 1951. Area 4 has been used for engine cleaning and manufacturing, and for storage of fuels, solvents, and paints. Contaminants of concern include heavy metals, cyanide, PCBs, semi-VOCs, and VOCs. Past disposal and/or uncontrolled releases are known to have contaminated soils and groundwater within this area.

Most of the area is covered by buildings or pavement; thus, neither surface water nor air are considered to be viable pathways with existing conditions. Since groundwater in the vicinity is not used for domestic purposes, it also does not present a completed pathway to human receptors; but it may have transported contaminants to the groundwater sediment interface where the groundwater discharges.

Therefore, viable pathways are limited to soils during intrusive activities and/or contact with off-site sediments that may have been contaminated in groundwater discharge areas. As discussed previously, exposure routes to humans would include ingestion, inhalation, and dermal contact.

Potential human and biota receptors are the same as discussed for Area 3.

8.1.5 Area 5 - Building 2

This area includes most of B-2 (Area 5 excludes the plating and heat treatment shops) which was originally constructed in 1929 and has been used for assembling of aircrafts and manufacturing of engines. The conceptual model for Area 5 is provide in Figure 8-5. Contaminants of concern include heavy metals, semi-VOCs, and VOCs. Past disposal and/or uncontrolled releases may have resulted in soil and groundwater contamination.

Most of this area is occupied by B-2 which restricts the number of potential pathways as neither surface water nor air presently represent viable pathways. As discussed in a previous section, there are no known uses of groundwater in the vicinity of SAEP; therefore, groundwater does not represent a complete direct pathway to human or biota receptors.

As shown on Figure 8-5, soil is the primary media with the potential to be contaminated and releasing contaminants. Potential contaminated soil could then release contaminants to a secondary medium (groundwater). The primary pathway to human receptors would be associated with intrusive activities in locations with contaminated soils. Potential exposure routes would include ingestion, inhalation, and dermal. Potential biota receptors to the workers would include organisms located in sediment areas where groundwater surfaces.

Human receptors would be primarily limited to SAEP workers involved with intrusive activities within areas with contaminated soils. Potential biota receptors are limited to organisms within areas where the groundwater discharges. Additional information is needed to confirm the presence or absence of contamination in the groundwater and to determine the movement pattern of groundwater before the groundwater pathway can be fully evaluated.

8.1.6 Area 6 - Research and Development Area

The conceptual model for Area 6 is shown in Figure 8-6. This area has been used for research and development for over 50 years and has involved the handling of metals, fuels, oils, and solvents. Contaminants of concern include: heavy metals, semi-VOCs, and VOCs.

Potential pathways to receptors are limited because most of the area is occupied by buildings or paved. Surface water and air are presently not viable pathways. As discussed previously, groundwater is not presently a completed direct pathway to human and biota receptors because groundwater is not used in the vicinity of SAEP.

If soils are found to be contaminated within this area, a potential pathway to human receptors would occur during intrusive activities that involve contaminated soils. If percolation of water through the soils results in contamination into the groundwater, a possible pathway to organisms in sediment may exist if the groundwater discharges to the sediment.

Human receptors would primarily be limited to SAEP workers involved with intrusive activities within locations containing contamination. Potential exposure pathways to these workers would include ingestion, inhalation, and dermal contact. Biota receptors would be primarily associated with organisms located within the groundwater/sediment interface.

Pathways and potential receptors cannot be properly evaluated without additional information on groundwater movement patterns, and the extent (if any) of contaminated soils and groundwater within Area 6.

8.1.7 Area 7 - Testing Area

This area has been used for the storage of fuels, contains the steam generating plant, and has been used for experimental (high altitude) engine testing. The conceptual model for Area 7 is provided in Figure 8-7. Contaminants of concern include heavy metals, semi-VOCs, and VOCs. During excavation for lagoon closure, petroleum-contaminated soils were reportedly observed within a portion of Site 7.

Potential pathways at this area are also reduced because the area is occupied by buildings or covered by pavement. No surface water or air pathways are present. Since no use is made of groundwater in the vicinity of SAEP, it does not present a direct pathway to human and biota receptors. It may represent an indirect pathway especially to biota receptors if contaminants are transported to the groundwater/sediment interface. Soil is the primary contaminated media and the primary exposure pathway to humans would be during intrusive activities into locations with contaminated soils. The exposure route would include ingestion, inhalation, and dermal. If sediments are contaminated at a groundwater/soil interface, this would represent a potential exposure pathway especially to biota receptors, and the exposure route would include ingestion and dermal.

Potential receptors are primarily limited to SAEP workers involved with intrusive activities and biota organisms within the groundwater/sediment interface. Information is needed on groundwater movement within the area and extent of contamination before the pathways and potential receptors can be properly evaluated.

8.1.8 Area 8 - Drainage Ditch

This area includes the natural tidal stream where treated chemical wastewater is discharged by permit into the Marine Basin. No hazardous materials are handled or generated within this area, but it represents a potential depositional area for runoff and effluent from SAEP. The drainage ditch receives runoff from a portion of SAEP, and since 1958 it has received treated effluent from the CWTP. The conceptual model for this area is presented in Figure 8-8. Chemicals of concern would primarily involve chemicals in the CWTP waste stream, and to a lesser extent, chemicals that would be associated with site runoff. These chemicals include heavy metals, cyanide, PCBs, semi-VOCs, and VOCs.

Since the primary source in this area is effluent from the CWTP, potential pathways include direct contact with the effluent, air emissions from the effluent and/or contaminated sediment, and direct contact with contaminated soils. Presently existing information is not adequate to determine if any of these pathways are complete to human or biota receptors.

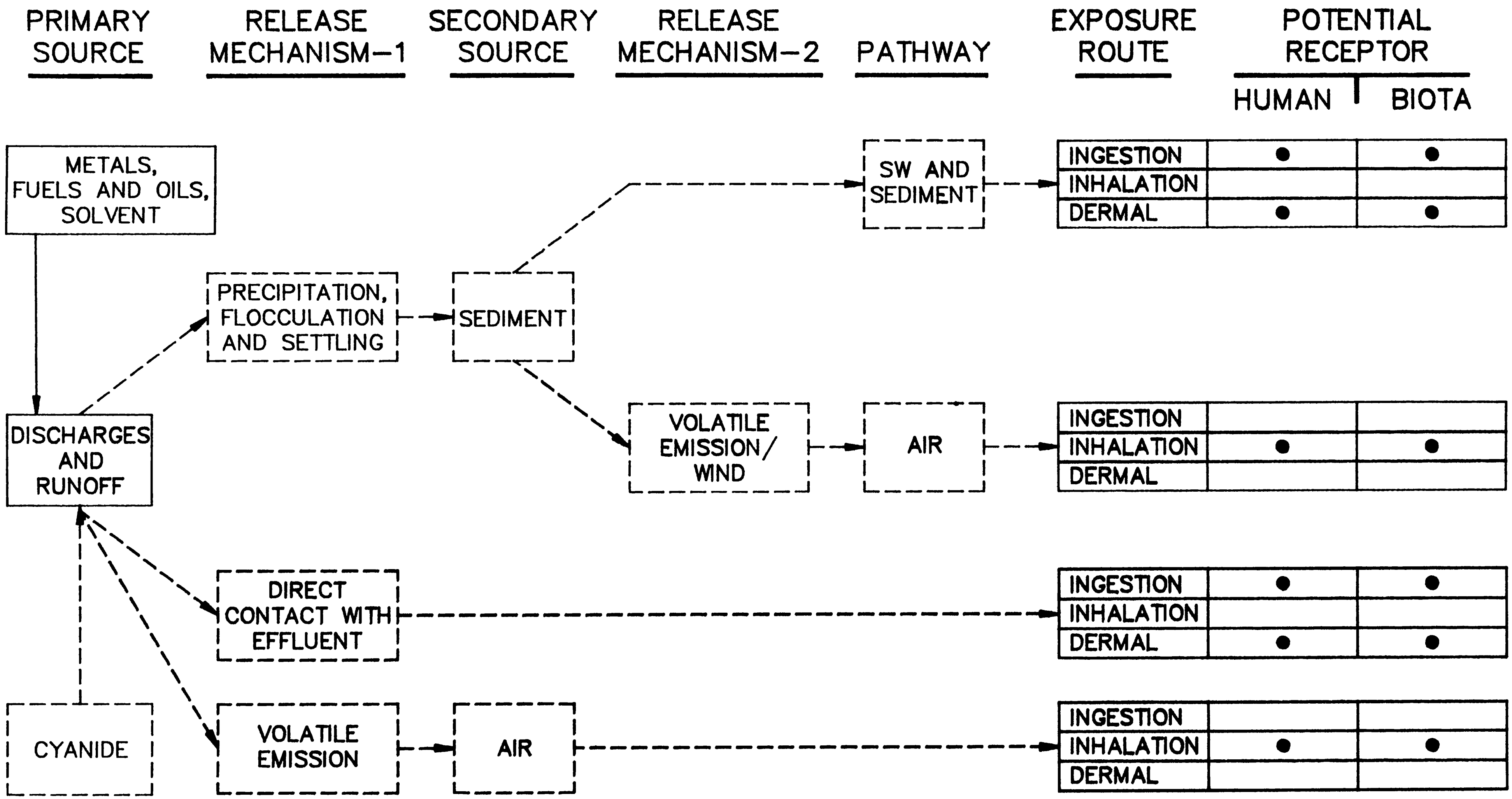
Potential human receptors include people that may come into contact with sediment of the drainage ditch associated with working (within SAEP) or recreational use (outside SAEP boundaries). Potential exposure routes include ingestion, inhalation, and dermal. Potential biota receptors would include organisms that live and/or feed within the drainage ditch and associated riparian areas.

Additional information is needed regarding the level (if any) of contaminants in the sediment of the drainage ditch.

8.2 SUMMARY

Information obtained during the record search conducted for this PAS report was not adequate to establish if any complete pathway to human or biota receptors exist. Because most of the site is occupied by buildings or pavement and groundwater in the vicinity of SAEP is not used, the number of potential pathways are reduced. Based on potential pathways, it would appear that workers associated with intrusive activities at SAEP would likely represent the primary human receptors. Biota organisms within the intertidal flats and the Marine Basin drainage ditch probably have the highest potential to be affected by chemicals of concern from SAEP.

Additional information is needed to properly evaluate if these receptors have the potential to be exposed to contaminants of concern.



NOTE:

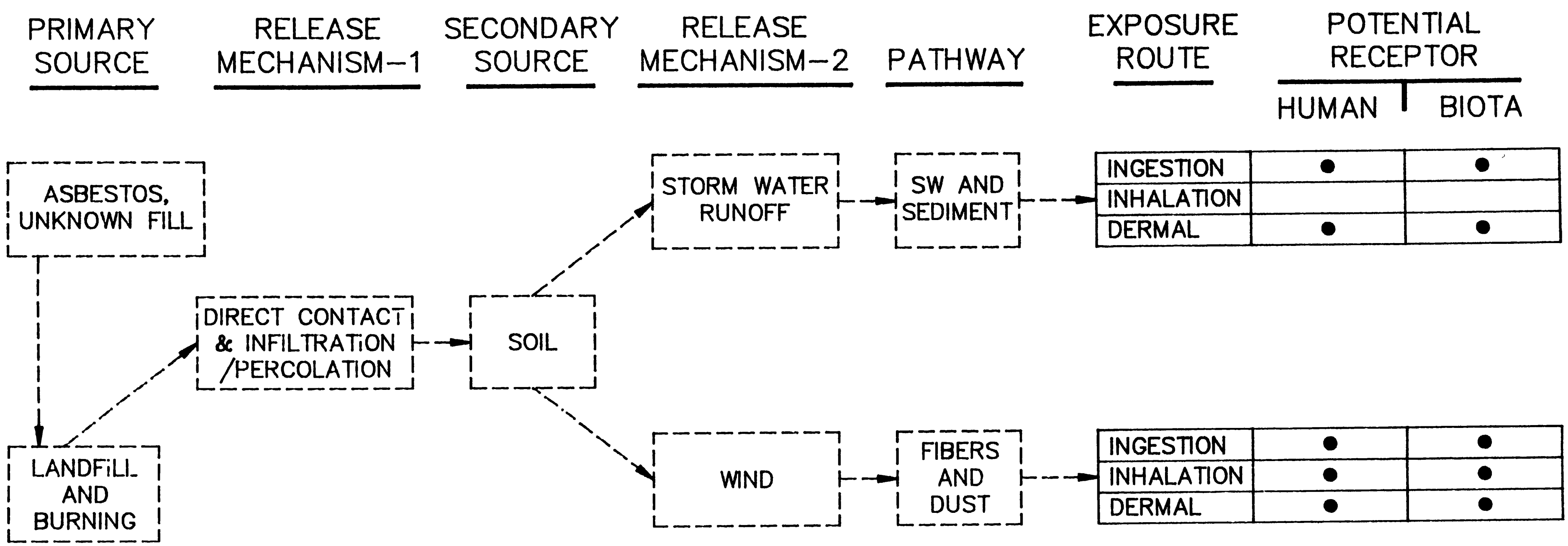
DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

CONCEPTUAL MODEL – AREA 1
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8–1
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

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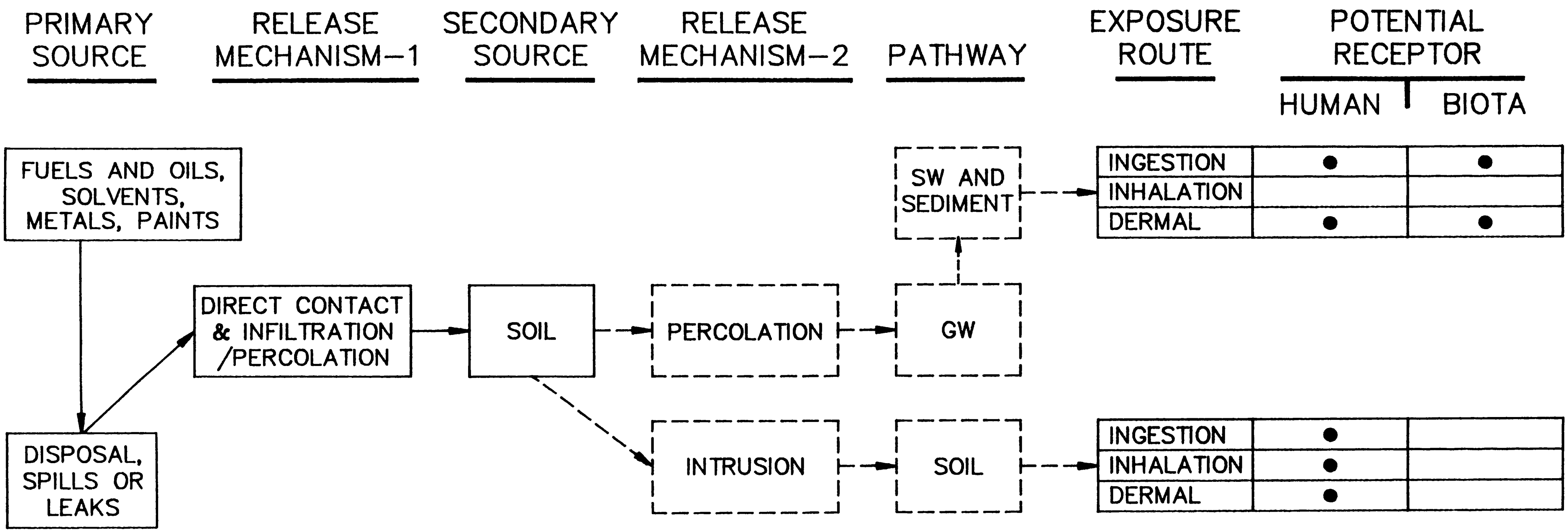
CONCEPTUAL MODEL – AREA 2
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8-2
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

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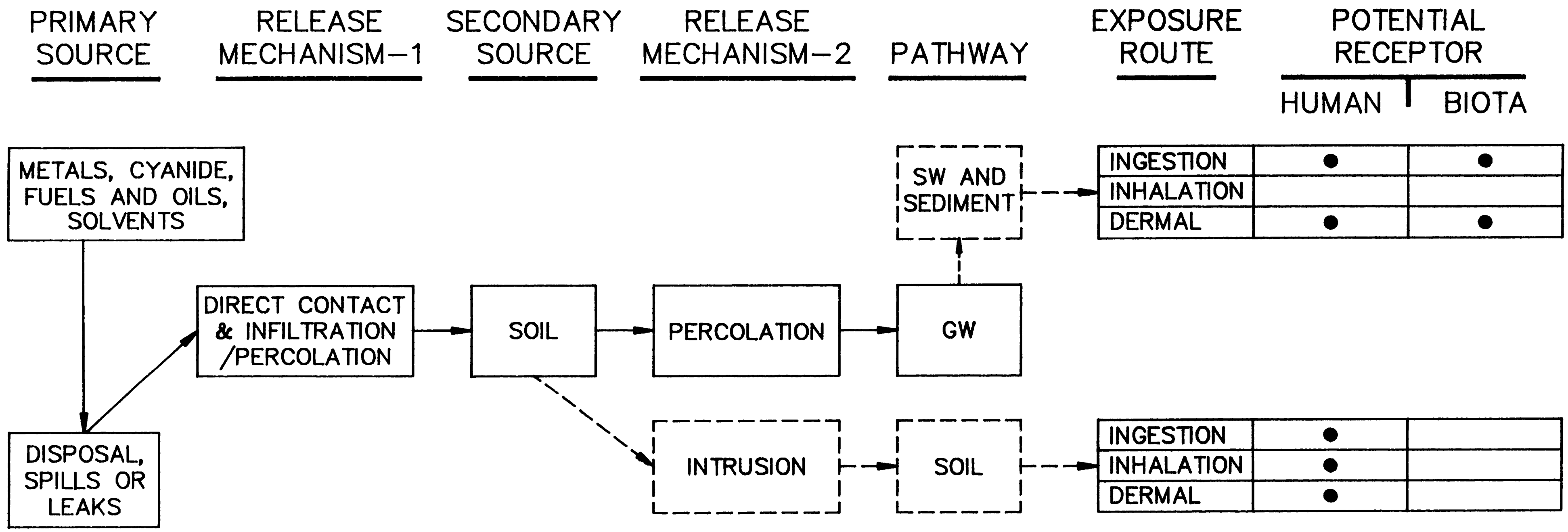
CONCEPTUAL MODEL – AREA 3
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8–3
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

Woodward-Clyde Consultants
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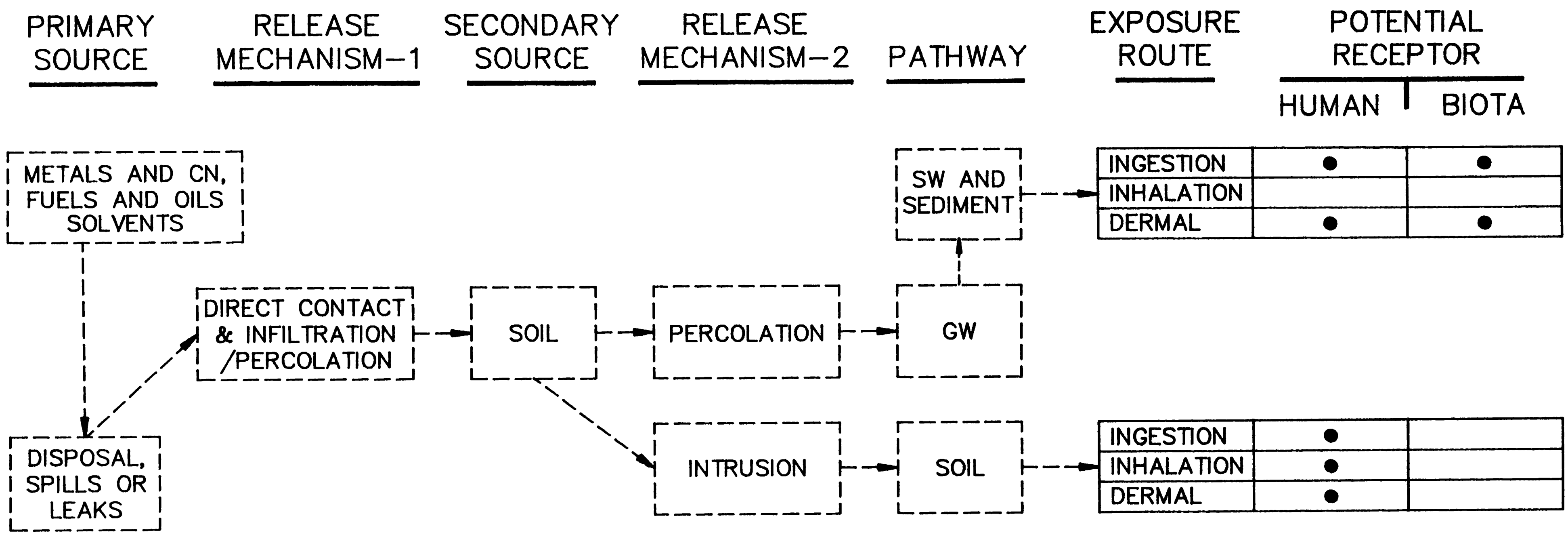
CONCEPTUAL MODEL – AREA 4
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8–4
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

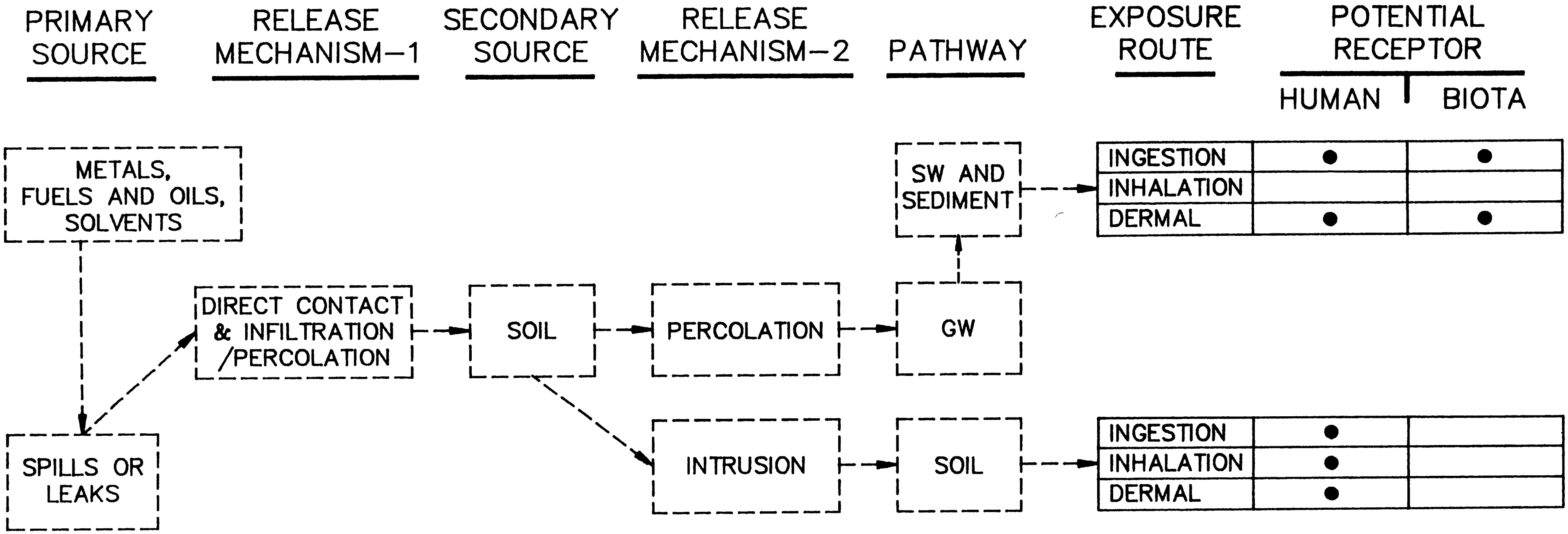
DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

Woodward-Clyde Consultants
ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

CONCEPTUAL MODEL – AREA 5
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO.		FIG. NO.
CHK'D BY JJH	DATE APRIL 1991	89MC114M		8-5



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

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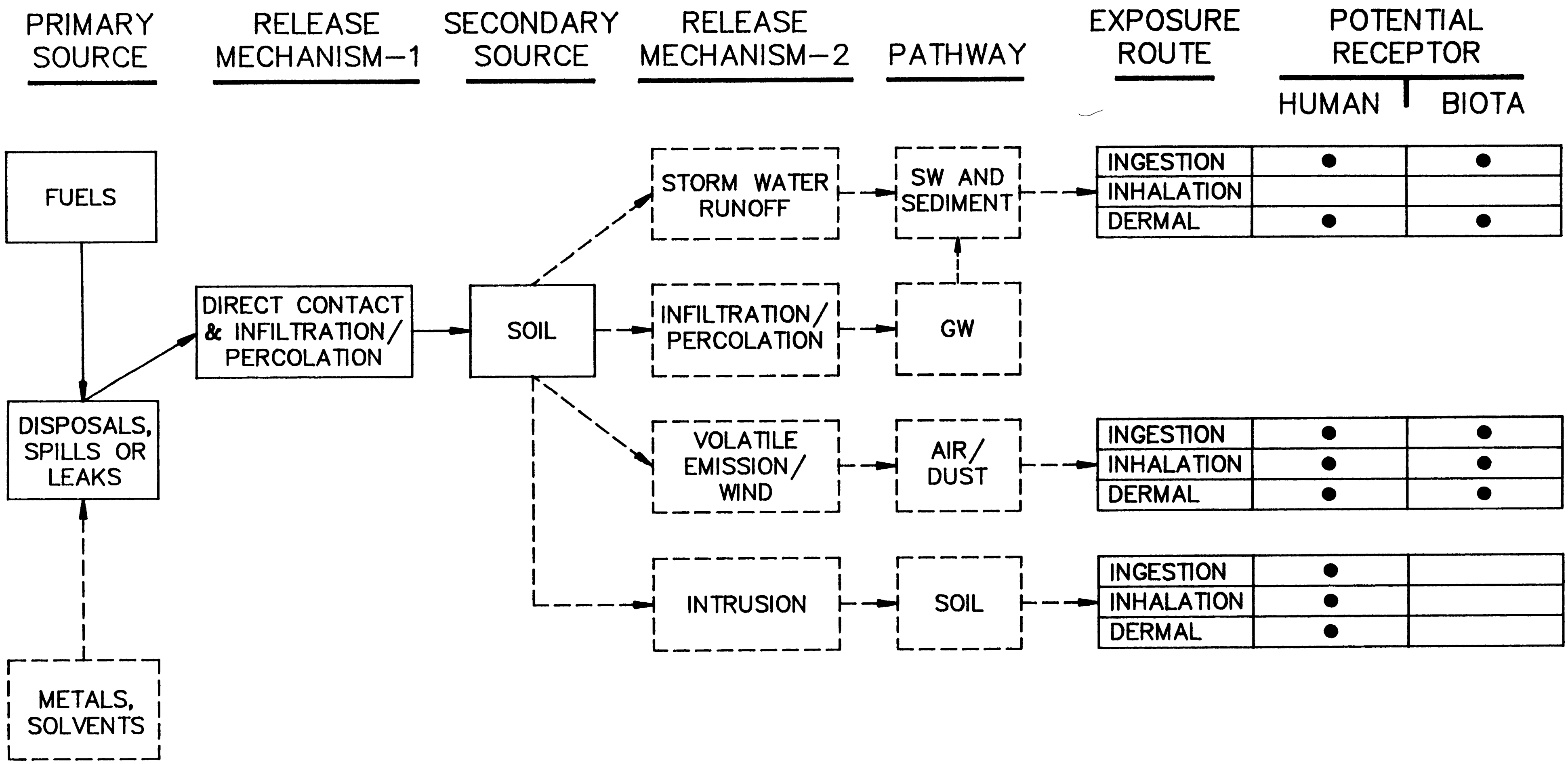
CONCEPTUAL MODEL – AREA 6
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8–6
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

Woodward-Clyde Consultants
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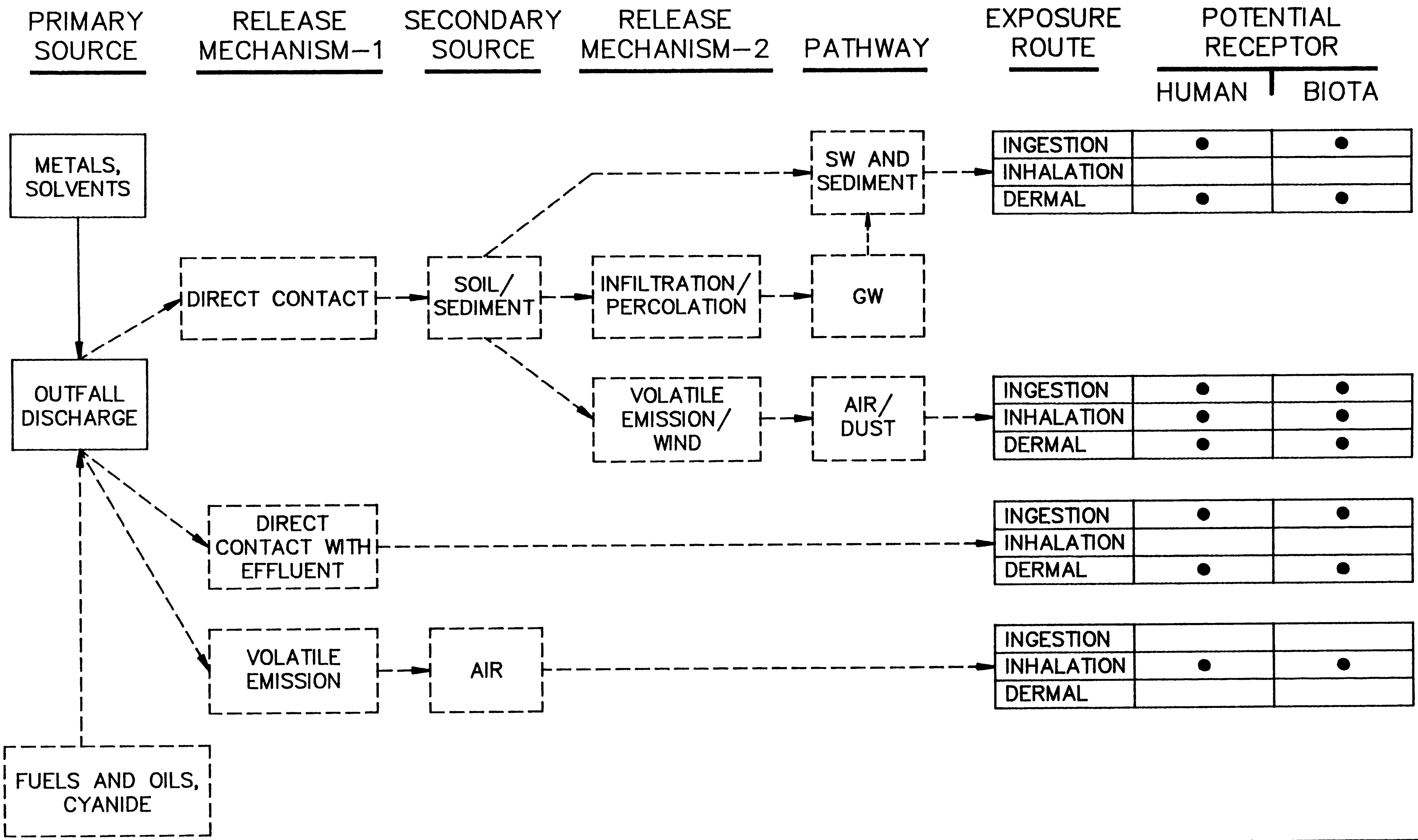
CONCEPTUAL MODEL - AREA 7
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8-7
CHK'D BY JJH	DATE APRIL 1991		



NOTE:

DASHED LINES REPRESENT POTENTIAL (UNVERIFIED) PATHWAYS FROM SOURCE TO POTENTIAL RECEPTORS.

SOLID LINES REPRESENT KNOWN PARTS OF PATHWAYS (BASED ON SI DATA) FROM SOURCE TO POTENTIAL RECEPTORS.

Woodward-Clyde Consultants
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CONCEPTUAL MODEL – AREA 8
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. 8–8
CHK'D BY JJH	DATE APRIL 1991		

9.0 RECOMMENDATIONS

Eight areas have been identified at SAEP as having the potential for release of contaminants to the environment (see Tables 6-1 through 6-8). The RCRA-closed lagoon sites were not included as one of these eight areas because of ongoing monitoring that appears to be sufficient to identify contaminants in groundwater and their movement. There is potential for building materials at SAEP to contain asbestos (see Table 4-7). There are known PCB-oil containing transformers on site (see Table 4-8); however, SAEP has replaced several transformers and will continue reduction as required.

Potential contaminants that may have been released to the environment at SAEP have been assessed for possible exposures to humans or biota, and each of the eight sites were found to have the potential to impact these populations. Based on the findings of this study, inadequate data are available at this time to identify site-specific contaminants or to conduct a risk assessment. Since the sites have potential to cause environmental disruption, but inadequate data are available to identify environmental contamination, a sampling phase investigation is warranted for each of the eight identified areas at SAEP.

Recommendations for future remedial work at SAEP include the following:

- A sampling phase study is recommended for the eight identified areas of potential contamination.

- An asbestos survey, including inspection and confirmation sampling, is recommended to identify the location and quantities of asbestos containing materials.

- Implementation of a removal program for PCB-oil containing transformers is recommended.

The sampling phase study should focus on the source and/or secondary source media identified by the conceptual models for each site, shown schematically in Figures 8-1 through 8-8. The transport pathways and potential exposure (or release) points should be addressed, with emphasis on "sensitive" populations (e.g., threatened or endangered species). Chemical analyses should be limited to those chemicals which are: (1) potentially toxic to humans and/or biota, and (2) have EPA defined critical toxicity criteria. At this time, the site hydrogeology is inadequately defined, i.e., groundwater movement patterns and tidal influences on groundwater are not known on a site-wide basis. A hydrogeologic study of the site is necessary because contaminant migration in groundwater is a potential pathway, and because the interaction of groundwater with the fluctuating tides is not defined.

The following objectives are recommended for the sampling phase study:

- Determine the presence or absence of contamination in the eight identified areas of concern

- Determine chemical concentrations at identified exposure (release) points; and

- Identify the site hydrogeology, including groundwater movement patterns and the influence of tidal effects on groundwater.

Sampling and analysis is necessary to confirm or refute the presence of contamination at each identified area of concern. Sampling media and contaminants of concern for each area are provided in Table 9-1. If confirmation sampling indicates the presence of contamination, additional sampling will likely be needed to identify the nature and extent of contamination. Additional sampling may require sampling of other media than shown on Table 9-1; for example, if sediments in the intertidal flats or drainage ditch are contaminated, it may be necessary to sample biota such as shellfish.

Groundwater monitoring wells will be required to collect groundwater samples for analysis and to define the site hydrogeology. A site-wide monitoring well network should be installed; this network should incorporate existing site monitoring wells located around the former lagoon area and between B-16 and B-5. The monitoring well network will require some well pairs and possibly well clusters of up to three wells to identify: vertical hydraulic gradients, vertical distribution of potential contaminants, and the presence of a freshwater/saltwater interface. Two-inch-diameter wells are recommended, and wells that penetrate the peat/silt layer should be double-cased.

Initially, monitoring wells should be used to collect groundwater samples for analysis, complete in situ hydraulic conductivity tests, measure groundwater levels, and determine the groundwater's response to tidal fluctuations. If contamination sources are identified during the sampling phase, additional wells will likely be required to define the extent of contamination in groundwater and to determine background levels. A groundwater pumping test may also be necessary in the future.

TABLE 9-1
RECOMMENDED SAMPLING MEDIA AND CONTAMINANTS OF CONCERN FOR THE EIGHT IDENTIFIED AREAS OF POTENTIAL ENVIRONMENTAL CONCERN AT SAEP[1]

Area	Sampling Media	Contaminants of Concern[2]
1 - Intertidal Flats	Sediment and Surface Water	Metals, Cyanide, PCBs, SemiVOCs, and VOCs
2 - Causeway	Soil	Asbestos, Metals, and PAHs
3 - Shoreline Fill	Soil and Groundwater	Metals, PCBs, SemiVOCs, and VOCs
4 - Plating and Manufacturing	Soil and Groundwater	Metals, Cyanide, SemiVOCs, and VOCs
5 - Building 2	Soil and Groundwater	Metals, SemiVOCs, and VOCs
6 - Research and Development	Soil and Groundwater	Metals, SemiVOCs, and VOCs
7 - Testing	Soil and Groundwater	Metals, SemiVOCs, and VOCs
8 - Drainage Ditch	Soil, Sediment, and Surface Water	Metals, Cyanide, PCBs, SemiVOCs, and VOCs

(1) The eight sites are shown on Figure 6-1.

(2) SemiVOCs = Semivolatile organic compounds
VOCs = Volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
PCBs = Polychlorinated biphenyls

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APPENDIX A
PHOTO DOCUMENTATION OF
STRATFORD ARMY ENGINE PLANT

This appendix contains reconnaissance photodocumentation of the site for the EBS at SAEP. A photographic log that describes each photograph is given first, followed by the photographs which are keyed to this log. The photographs have been arranged according to the identified 8 sites of potential environmental concern.

Area 1

1-1	Outfall 001, looking north from dike.
1-2	Outfall 002 and 003, looking north from dike.
1-3	Outfall 007 from OATP and Outfall 004, looking south from waterline.
1-4	Discharge from Outfall 007, looking southwest.
1-5	Outfall 005, looking west from waterline.
1-6	Outfall 006, looking north from dike.
1-7	Intertidal flats, north of outfall 001, looking north.
1-8	Intertidal flats, south of causeway, looking south.
1-9	Housatonic River, looking north from causeway.
1-10	Housatonic River, looking south from causeway.

Area 2

2-1	West end of causeway, looking northeast.
2-2	East end of causeway, looking northeast.
2-3	Roofing material on east end of causeway., looking north.
2-4	Construction rubble and debris on causeway, looking west.
2-5	Construction rubble and debris on causeway, looking southeast.
2-6	B-59, looking east.

Area 3

3-1	Typical storm drain station, looking southeast.
3-2	Magnesium/Thorium storage yard, looking east.
3-3	Satellite storage area at B-58, looking north.
3-4	Tank farm, looking east.
3-5	Empty drums at hazardous materials storage area, looking southwest.
3-6	Hazardous materials storage area, looking east.
3-7	Raw material storage outside southeast side of B-15, looking northwest.
3-8	Drain near waste oil and fuel pit fill boxes at north side of B-13, looking southeast.
3-9	Waste oil pit fill boxes at north side of B-13, looking southeast.

3-10	Metal cutting bin west of B-13, looking north.
3-11	Oil Abatement Treatment Plant, looking southeast.
3-12	Oil Abatement Treatment Plant, looking northeast.
3-13	400,000-gallon No. 6 fuel oil tank located between B-44 and B-48, looking north.
3-14	Liner around 400,000-gallon No. 6 fuel oil tank, looking north.
3-15	Drum storage within B-8, looking southeast.
3-16	Drum storage area outside west side of B-7, looking northeast.
3-17	Liquids on pavement near storm drain between B-7 and B-9, looking east.
3-18	Location of underground storage tanks south of B-9, looking west.
3-19	Area between east side of B-16 and fence, looking southeast.
3-20	Waste oil disposal docks located on east side of B-16 (waste oil was poured into bowsers from docks after use in engine tests), looking north.
3-21	Area between east side of B-16 and fence, looking northwest.
3-22	Cooling tower and diesel fuel tanks located south of B-16, looking east.
3-23	Fuel tanks located south of B-16, looking north.
3-24	Engine test cell P10A located in B-16, looking east.
3-25	Satellite waste material storage located in B-16, looking southwest.
3-26	Drum storage east of B-5 and north of B-19, looking north.
3-27	JP-4 storage tanks north of B-19, looking southeast.
3-28	Area between east side of B-19 and fence, looking south.

<u>Area 4</u>

4-1	B-70, looking north.
4-2	B-70 and B10, looking northeast.
4-3	B-3, B-3A, B-4, and B-67, looking.
4-4	B-3 and B-70, looking southeast.
4-5	B-2 and B-70, looking south.
4-6	Area between B-2 and B-10, looking north.
4-7	Empty carbouys outside east side of B-2, looking southwest.
4-8	Hazardous materials storage outside east side of B-2, looking west.
4-9	Heat treating area in B-2, looking southwest.
4-10	Area under metal grates in heat treating area, looking northwest.
4-11	Drainage trough in heat treating, looking north.
4-12	Rectifier room in B-2 (black material on floor behind plating tank), looking southeast.
4-13	Typical vapor degreasing tank located in B-2, looking west.

4-14	Plating room in B-2, looking north.
4-15	HAE room in B-2, looking south.
4-16	Anodize room in B-2, looking south.
4-17	Area under floor in computer center (former plating shop) of B-3.
4-18	Floor drain in B-10, looking north.
4-19	Maintenance area in B-12, looking west.

<u>Area 5</u>

5-1	Receiving area north of B-2, looking east.

<u>Area 6</u>

6-1	Drum storage east of B-4, looking west.

<u>Area 7</u>

7-1	North side of B-6, looking west.
7-2	Salvage materials area east of B-53, looking southeast.
7-3	Area between B-6 and B-53, looking west.
7-4	Monitoring wells south of B-6, looking northeast.
7-5	Closed sludge lagoon south of B-6, looking south.
7-6	Tanks at B-72, looking west.
7-7	Engine Test Cell D-5 in B-6.

<u>Area 8</u>

8-1	Tidal marsh east of B-18, looking east.
8-2	Closed equalization lagoon, tidal marsh to left, looking southeast.
8-3	Closed equalization lagoon, looking south.
8-4	Closed equalization lagoon near B-18, closed city landfill in background, looking southeast.

1–1

1–2

1–3

1–4

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB CHK'D BY JJH	DATE APRIL 1991 DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A–1

1-5

1-6

1-7

1-8

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-2
		CHK'D BY JJH	DATE APRIL 1991		

1-9


1-10

2-1

2-2

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-3
		CHK'D BY JJH	DATE APRIL 1991		

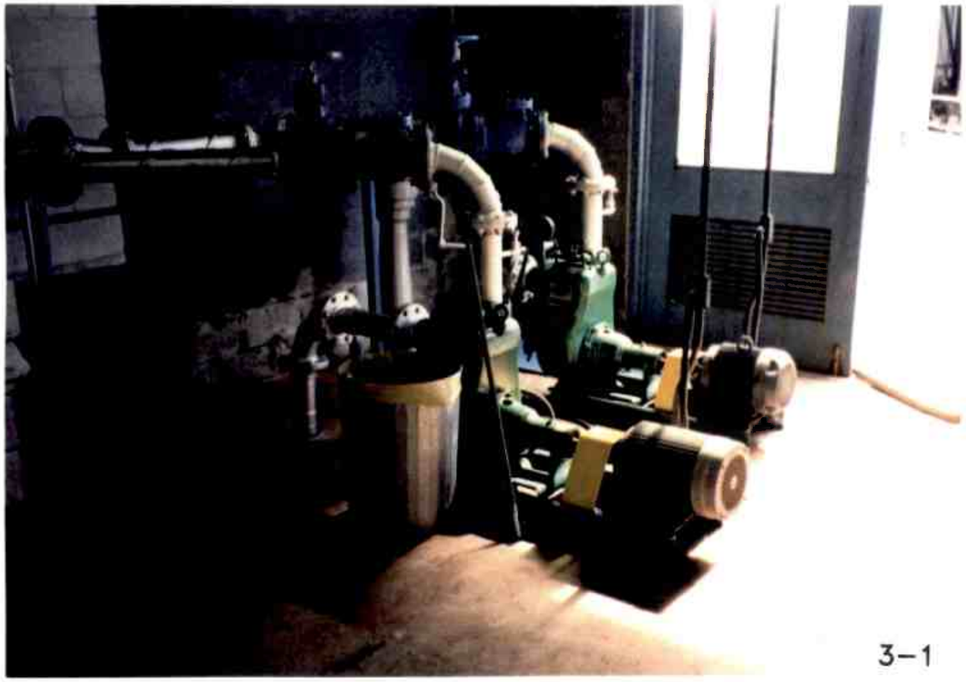
2–3

2–4

2–5

2–6

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A–4
		CHK'D BY JJH	DATE APRIL 1991		



3-1

3-2

3-3

3-4

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-5
		CHK'D BY JJH	DATE APRIL 1991		

3-5

3-6

3-7

3-8

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-6

3-9

3-10

3-11

3-12

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-7

3-13

3-14

3-15

3-16

Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-8
		CHK'D BY JJH	DATE APRIL 1991		

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-9
		CHK'D BY JJH	DATE APRIL 1991		

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB CHK'D BY JJH	DATE APRIL 1991 DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-10

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB CHK'D BY JJH	DATE APRIL 1991 DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-11

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-12

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-13

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-14

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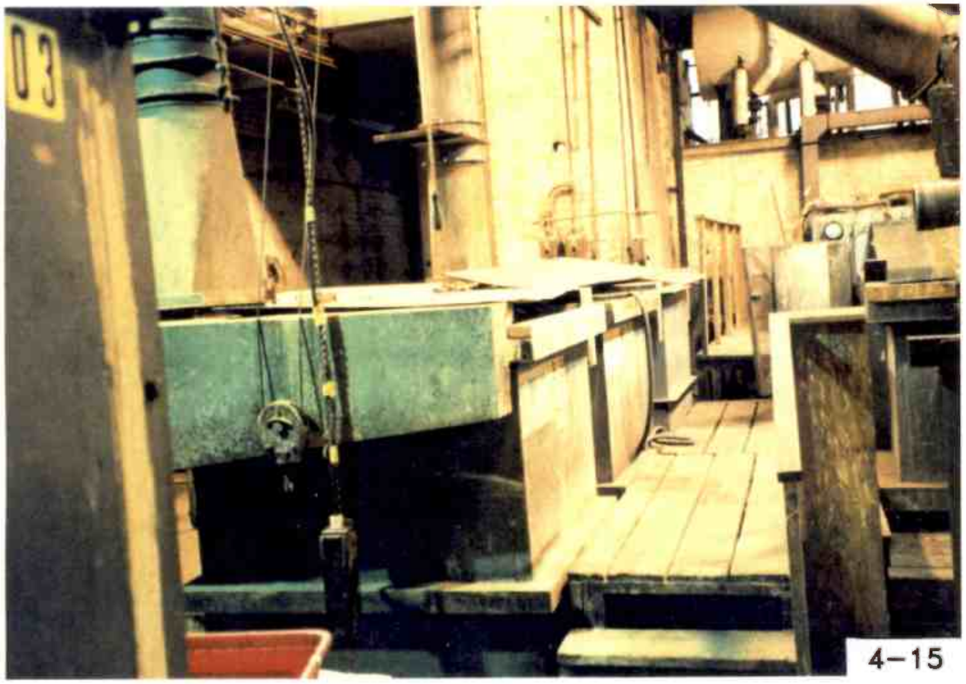

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO.	FIG. NO.
		CHK'D BY JJH	DATE APRIL 1991	89MC114M	A-15

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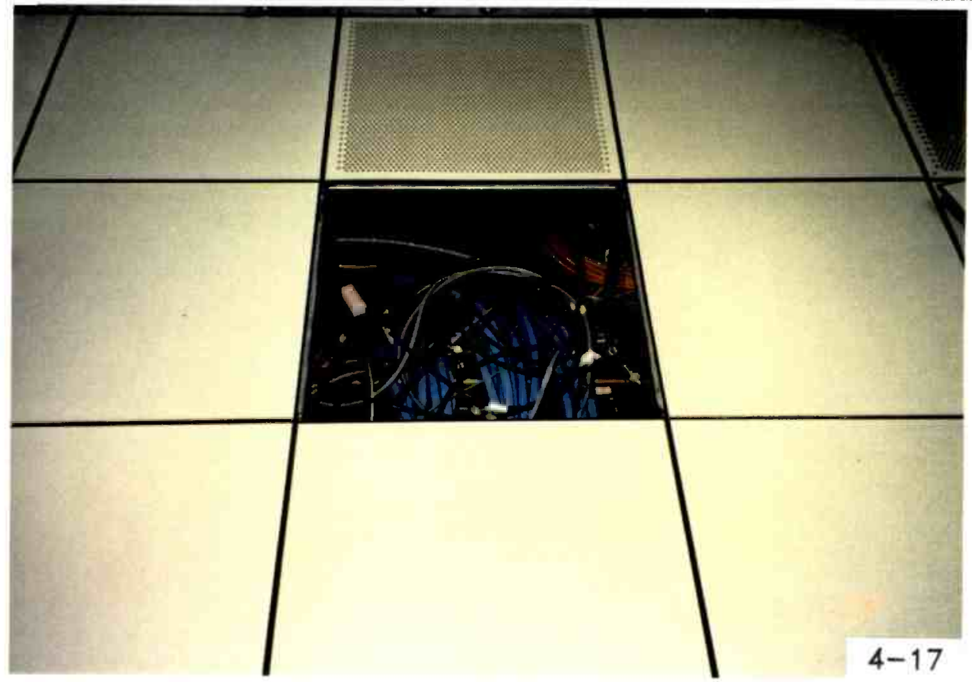

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-16
		CHK'D BY JJH	DATE APRIL 1991		

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A–17
		CHK'D BY JJH	DATE APRIL 1991		

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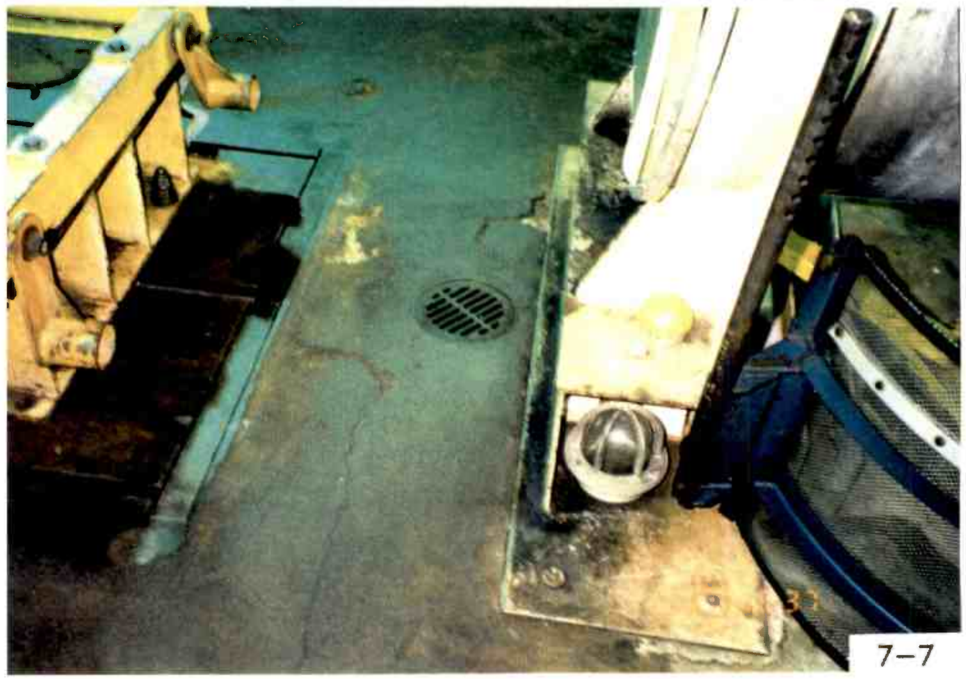

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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB	DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-18
		CHK'D BY JJH	DATE APRIL 1991		


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Woodward-Clyde Consultants ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS	SITE PHOTOGRAPHS STRATFORD ARMY ENGINE PLANT STRATFORD, CONNECTICUT	DRN BY EAB CHK'D BY JJH	DATE APRIL 1991 DATE APRIL 1991	PROJECT NO. 89MC114M	FIG. NO. A-19

APPENDIX B
LIST OF INTERVIEWEES

DEPARTMENT	INTERVIEWEE	YEARS EXPERIENCE AT SAEP
Engineering	Mr. Pete DiCarlo	34
Engineering	Mr. Ken Dangle	34
Engineering	Mr. Raymond Braining	37
Engineering	Mr. Ray Hines	32
Engineering	Mr. Joe Rotell	34
Engineering	Mr. Peter Chandler	35
Engineering	Mr. Stanley Marzak	35
Plant Engineering	Mr. Pete Bonitatebus	13
Plant Engineering	Mr. Quinto Carloni	12
Plant Engineering	Mr. Alan Monelli	8
Plant Engineering	Mr. Robert Carr	13
Plant Engineering	Mr. Tom Silva	28
Plant Engineering	Mr. George Guinta	40
Plant Engineering	Mr. Neil Sansone	34 (retired 1985)
Plant Engineering	Mr. Frank Brunyansky	30 (left SAEP 1981)
Plant Maintenance	Mr. Bill Eaton	29
Plant Maintenance	Mr. William Hickey	5
Plant Maintenance	Mr. Paul Segala	32 (retired 1984)
Plant Maintenance	Mr. Bill Fantasia	32 (retired 1983)
Manufacturing	Mr. Robert Dennis	27
Manufacturing	Mr. William Ezarik	36
Manufacturing	Mr. Joe Losardo	45 (retired 1982)
Manufacturing	Mr. Dave Carpenter	12
Environmental	Mr. John Fleming	6
Environmental	Mr. Robert Kelley	1
Environmental	Ms. Beverly Gaal	1
Other	Mr. Jack Sherman	33
Other	Mr. Larry O'Connell	

APPENDIX C
SITE CHRONOLOGY OF
STRATFORD ARMY ENGINE PLANT

1928	Sikorsky Aviation Corporation (subsidiary of United Aircraft and Transport) purchases approximately 26 acres in Stratford, Connecticut; A. C. Dickinson, President; Igor Sikorsky, Vice President of Engineering.
1929	Construction starts on Bldgs. 1, 2, and 10; Sikorsky Aviation Corporation becomes subsidiary of United Aircraft and Transport Corporation (now United Technologies); purchase of approximately 11 acres of land.
1930	Construction of Bldg. 3 and a "vertical-type" wind tunnel for models.
1931	Production of the S-40 "Flying Clipper" amphibian aircraft begins.
1933	Production of S-42 "Pan-American Clipper" flying boat begins.
1935	Production of S-44.
1938	First flight of X052U-2, "The King Fisher".
1939	Production of S-43 begins; Sikorsky Aviation Corporation becomes Vought-Sikorsky Aircraft Division; extensive plant refurbishment begins; first flight of VS-300 helicopter; construction of Bldg. 8.
1940	Production of the OS2U-2, "The King Fisher" begins; first flight of XF4U-2 "Corsair".
1941	Construction of additions to Bldgs. 1, 2, 3, and 10/11. Construction of Bldg. 12; purchase of approximately 15 acres of land including riparian rights.
1942	Production of VS-300/R-4 helicopter, F4U-1 "Corsair"; construction of addition to Bldg. 2; construction of Bldgs. 7 and 9; purchase of approximately 39 acres of land including riparian rights.
1943	Sikorsky Aircraft Division leaves plant and Chance Vought stays; Construction of additions to Bldgs. 1 and 2; construction of Bldg. 3A; purchase of approximately 3 acres of land and riparian rights.

1944	Construction of additions to Bldg. 2; construction of Bldgs. 5, 6, 13, 19, 42, and 43; purchase of approximately 6 acres of land and riparian rights; shoreline extension.
1945	Construction of Bldgs. 4 and 15.
1948	Production of XF6U-1, "The Pirate" - Chance Vought's first jet aircraft; Chance Vought moves company to Dallas, Texas.
1948-51	Plant site abandoned.
1949	A major flood of the Housatanic River renders plant's 1,580,000 sq. ft. of manufacturing space unusable; plant site put up for sale.
1951	U.S. Air Force procures plant and names it USAF Plant No. 43; Bridgeport-Lycoming Division of Avco takes over plant through U.S. Air Force contract to produce T-53 jet engines; becomes Avco-Lycoming; dike construction begins.
1952	Production begins on Curtis-Wright 9-cylinder R1820 radial engine; production begins on major components for J-47 jet aircraft; construction of B-17; purchase of approximately 15 acres of land.
1953	Construction of Bldgs. 16, 33, 34, 36, 37, 38, 40, 41; first flight of T-53 helicopter engine.
1958	Construction of Bldgs. 18 and 63 (chemical waste treatment plant); production of T-53 helicopter engine.
1961	Production of T-55 helicopter engine; production of ALF502 turbofan engine; construction of Bldgs. 44, 48, and 53.
1962	Construction of Bldgs. 7A and 52.
1963	Production of T-55 helicopter engines for cargo helicopters.
1964	Development of engines for amphibious hydrofoils.

1965	Development of AGT1500 vehicular turbine engines.
1966	Construction of Bldg. 6A.
1967	Construction of Bldg. 58.
1968	Construction of Bldgs. 59 and 60.
1969	Construction of Bldg. 61.
1972	Production of gas turbine engines for the first commercially powered hovercraft in U.S.; manufacturing of re-entry vehicles for the Titan and Minuteman ICBM programs.
1975	Construction of Bldgs. 64-1 and 64-2 (oil abatement plant).
1976	USAF Plant No. 43 transferred to U.S. Army and plant renamed Stratford Army Engine Plant; operated by Avco-Lycoming; production of "Super TF" marine and industrial engine begins.
1977	U.S. Aviation Systems Command (AVSCOM) becomes responsible for SAEP.
1978	Avco wins M-1 Abrams tank engine contract.
1982	Beginning of Industrial Productivity Improvement/Industrial Resource Enhancement Program (IREP); easement granted to Town of Stratford for sewer line running across SAEP.
1984	Construction of Bldg. 72.
1985	Textron merges with Avco to become Textron-Lycoming Stratford Division; continues production of turbine engines for military and commercial aircraft and land vehicles; construction of Bldgs. 67 and 69.
1986	Construction of Bldgs. 68, 70, and 71; modification to chemical waste treatment plant.

1988	Encapsulation of B-19.
1990	Construction of Bldg. 65 begins.

APPENDIX D
MATERIAL SAFETY DATA SHEETS FOR STRATFORD ARMY ENGINE PLANT

This appendix contains the database of Material Safety Data Sheets for SAEP. This database was prepared by SAEPs Safety Office.

Record#	PRODUCT	COMPOUND	VENDOR	USE	TELEPHONE	DATE
1	1687	Hydrochloric Acid		Acid		12/20/82
2	30068,30121	PolyoxyPropyleneDiamine,EpoxyR		Resurfacing Compound		/ /
3						/ /
4	30114	Sodium Hydroxide		Cleaner, metal		10/10/80
5	Sodium Hypochlorite, Bleach	Sodium Hypochlorite		Bleach		/ /
6						/ /
7	312 Ceramic Fiber	Aluminaborosilicate fibers	3-M	Ceramic Fiber	612-733-1110	05/11/90
8	3M Brand Type 148 Toner	Resin Mixture	3M	toner	612-733-1110	08/29/90
9	Ammonia Absorber Pack	Citric Acid	3M	Absorbant	612/733-1110	12/01/89
10	252 Developer Premix	Carrier (iron)	3M	Developer	612/733-1110	07/21/88
11	6065 Scotch Spray Mount Ahesiv	1,1,1-Trichlor 50-60%	3M	Adhesive	612/733-1110	12/30/89
12	"Stamark" Contact Cement E-44	Hexane	3M	Cement	612/733-1110	02/20/86
13	852 Developer Premix	Iron Particles	3M	Developer Premix	612/733-1110	07/21/88
14	CD-5 Developer	Sodium Hydroxide, Pot. Bromide	3M	Developer	612/733-1110	09/30/87
15	152 Developer Premix	Iron Particles	3M	Developer Premix	612/733-1110	07/21/88
16	EC-3524 (Part A)	N/A	3M	Adhesive, coating	612/733-1110	12/03/85
17	EC-3524 (Part B)	N/A	3M	Adhesive, plastic	612/733-1110	12/03/85
18	Dry Silver Paper Type 735	Paper (backing)	3M		612/733-1110	02/09/88
19	Diskette Head Cleaning Kits	Isopropyl Alcohol 67-69%	3M	Cleaner	612/733-1110	10/29/86
20	Scotchfil Elect Insul Putty	Resin, epoxy	3M	Adhesive	612/733-1110	11/11/85
21	Scotchcast Brand 4 Elec Insul	Resin, liquid epoxy	3M	Adhesive,epoxy	612/733-1110	10/18/85
22	Scotch-Grip Rbr+Gskt Adh 880	Petroleum Distillate	3M	Adhesive	612/733-1110	10/01/85
23	Products W/Aluminum Oxide Min.	Aluminum Oxide Mineral	3M	various	612-733-1110	04/11/90
24	Scotch-Brite Gamma Ind. Surf.	mixture of material	3M	Wheels, Pads, Rolls	612-733-1110	06/15/90
25	Scotch-Weld Ep Adh 2214 Hi-Tem	Resin Blend, epoxy	3M	Adhesive, epoxy	612/733-1110	07/25/86
26	Scotch-Grip 1711 Rbr+Gskt Adh	Toluene/Petroleum Distillate	3M	Adhesive, rbr + gskt	612/733-1110	03/11/88
27	Scotch-Grip Plastic Adh 1099	Acetone	3M	Adhesive, plastic	612/733-1110	11/02/85
28	Scotch Br 6065 Spra-Mount Adh	1,1,1-Trichloroethane	3M	Adhesive	612/733-1110	12/01/81
29	Scotch-Grip 1357 Adhesive	mixture petroleum distillate	3M	HP Contact Adhesive	612-733-1110	04/12/90
30	Scotch-Seal Indus. Sealant 612	Polysulfide Rubber	3M	Insulation	612/733-1110	11/02/85
31	Quantimatic Toner Type 748F	Resin, polystyrene	3M	Toner, quantimatic	612/733-1110	07/21/88
32	R Process Gum	Water 80-90%	3M		612/733-1110	04/18/89
33	R Scratch Remover	Water50-60%,Stoddard Sol20-30%	3M	Cleaner	612/733-1110	04/18/89
34	Scotch-Weld Ep Adh 2214 Hi-Fle	Resin Blend (epoxy),aluminum p	3M	Adhesive, epoxy	612/733-1110	01/20/87
35	793/795 Dry Silver Paper	paper backing	3M	Paper	612-733-1110	08/07/90
36	Type 248 Toner	Resin, styrene acrylic	3M	Toner	612/733-1110	12/19/89
37	Type 148 Toner	Resin Mixture	3M	Toner	612/733-1110	12/19/89
38	Type 028 Fix	Ammon.Thiosulfate,Amm.Thiocyan	3M	Fixer	612/733-1110	08/04/87
39	Type 735 Dry Silver Paper	Paper Backing	3M		612/733-1110	11/28/89
40	Anti-Static Cleaner/Staticide	Isopropanol	ACL	Cleaner	312/981-9212	/ /
41	Staticide Wipes	N/A	ACL	Medical	312/981-9212	04/30/87
42	Specialty/Stainless Steel	Steel, specialty/stainless	AL	Alloy	518/273-4110	11/06/85
43	Copper Base Alloy Castings,etc	Copper	Aapco	Alloy (casting)	414/645-3750	11/25/85

44	Lubricating Oil	Proprietary Ashless Compound	Abbalube	Lubricant	203/457-1599	04/28/88
45	523005...524099	Steel	Abex	Alloy	414/542-0741	11/01/85
46	38-27E...317GG	Asbestos	Abex	Insulation	703/662-3871	11/12/85
47	Diamond and CBN Wheels	Nickel Bonded Abrasive	Abrasive Technology	Abrasive Wheel	614-548-4100	06/06/88
48	All Diamond/CBN Dress/Cut Tool	N/A	Accurate Diamond	Tool,dressing/cuttin	201/342-0226	/ /
49	Diamond/CBN...Plated Products	N/A	Accurate Diamond	Abrasive	201/265-8868	07/12/90
50	Diamond/CBN Grind Prod,Res,Met	Diamond+CBN Products	Accurate Diamond	Tool	201/342-0226	/ /
51	Natural Diamond...Cutting Tool	N/A	Accurate Diamond	Abrasive	201/265-8868	07/12/90
52	Sodium-NitroBenzene Sulfonate	Sodium-NitroBenzene Sulfonate	Aceto		212/898-2300	/ /
53	E-Kote 40 Aerosol	N/A	Acme	Coating	203/562-2171	09/16/88
54	All Cem Tungsten Carbide Grade	TungstenCarbide mixed w/cobalt	Adamas	Metal Removal	201/241-1000	11/25/85
55	Mirrocut/Mirromil	Titanium Carbide	Adamas	Grinding	201/241-1000	11/25/85
56	Aeroquip Hose	N/A	Aeroquip		419/238-1190	08/06/86
57	Dynuba 100	Mixture	Aerosol Systems Inc.	Solvent	216-467-4195	08/12/88
58	High Perform-Heat Resist Alloy	N/A	Aerospace	Alloy	203/649-0092	/ /
59	Carbon Dioxide	N/A	Air Prod.	Gas	215/481-4911	02/16/81
60	Helium	N/A	Air Prod.	Gas	215/481-4911	02/16/81
61	Oxygen	Oxygen	Air Prod.	Gas	215/481-4911	02/01/89
62	Nitrogen	Nitrogen	Air Prod.	Gas	215/481-4911	08/27/87
63	Argoshield Gas 8C, 25C	Argon, Carbon Dioxide	Airco	Gas Mixture	201/464-8100	07/10/89
64	Argon, Refrigerated Liquid	N/A	Airco	Gas	201/464-8100	08/07/89
65	Carbon Dioxide Solid	N/A	Airco	Gas	201/464-8100	07/01/86
66	Carbon Dioxide, Refrig. Liquid	N/A	Airco	Gas	201/464-8100	07/01/86
67	Helium, Gas	N/A	Airco	Gas	201/464-8100	07/07/89
68	Helium Refrigerated Liquid	N/A	Airco	Gas	201/464-8100	08/07/89
69	Hydrogen, Refrig Flamm Gas	N/A	Airco	Gas	201/464-8100	/ /
70	Nitrogen	Nitrogen	Airco	Gas	201/464-8100	07/01/86
71	Nitrogen, Refrigerated Liquid	N/A	Airco	Gas	201/464-8100	08/09/89
72	Oxygen	Oxygen, refrig. liquid	Airco		201/464-8100	07/01/86
73	Nitrous Oxide	Nitrous Oxide, refrig. liquid	Airco	Gas	201/464-8100	07/01/86
74	Airflex Models: 15 MSDS	N/A	Airflex/Eaton	Clutches,Brakes,Coup	216/281-2211	06/22/88
75	Steel	Metal	Al Tech Specialty Steel Corp.	Steel	716-366-1000	08/28/90
76	Methanol	Methyl Alcohol	Alberta	Solvent	403/527-8141	12/22/87
77	Alcan Aluminum Metal	4XXX Series Alloy	Alcan	Alloy	216/523-6800	11/01/85
78	Alcan Aluminum Metal	1XXX series alloy	Alcan	Alloy	216/523-6800	11/01/85
79	Alcan Aluminum Metal	5XXX Series Alloy	Alcan	Alloy	216/523-6800	11/01/85
80	Alcan Aluminum Metal	3XXX Series Alloy	Alcan	Alloy	216/523-6800	11/01/85
81	Alcan Aluminum Metal	8XXX Series Alloy	Alcan	Alloy	216/523-6800	11/01/85
82	Alcan Aluminum Metal	7XXX Series Alloy	Alcan	Alloy	216/523-6800	11/01/85
83	Aluminum Alloys w/ Lead	N/A	Alcoa	Alloy	412/553-4001	11/11/85
84	Aluminum Alloys	N/A	Alcoa	Alloy	412/553-4001	03/10/88
85	Remelt Ingot	Aluminum	Alcoa		412/553-4001	06/19/85
86	Liqui-Nox	N/A	Alconox		212/473-1300	01/05/87
87	Alconox	Anionic Detergent	Alconox Inc.	Detergent	212-473-1300	01/10/86
88	Breakthru	Propylene Glycol Methyl Ether	Alfred		718/821-0909	02/10/86

89	Royal Treatment	Acrylic Floor Finish	Alfred	Hydrocarbon	718/821-0909	/ /
90	Royal Treatment	Hydrocarbon	Alfred-American Pad-Ex	Acrylic Floor Finish	212/456-9666	/ /
91	Category III-F:1625,1647,6601	Steel, specialty	Allegheny Ludlum	Alloy	412/226-5059	11/08/89
92	SMD 1 thru 11 + Categ. I-IV,VI	Steel, specialty	Allegheny Ludlum	Alloy	412/226-5059	10/22/85
93	Stainlees and Specialty Steel	Steel	Allegheny Ludlum Corporation	Stainless Steel	412-845-0320	11/12/90
94	Lithium batteries (2706-NB1)	N/A	Allen-Bradley			01/01/88
95	Acetone	Ketone	Allied	Cleaner	201/455-4157	12/02/88
96	Genesolv-D solvent-many grades	Trichlorotrifluoroethane	Allied	Solvent	201/455-4157	04/01/81
97	Chromic Acid	N/A	Allied	Acid	201/455-4157	12/01/84
98	Isopropyl Alcohol	N/A	Allied	Solvent	201/455-4157	11/19/82
99	Hydrofluoric Acid, aqueous	N/A	Allied	Acid	201/455-4157	01/06/89
100	Hydrochloric Acid	Hydrochloric Acid	Allied	Acid	201/455-4157	/ /
101	Sodium Dichromate	N/A	Allied		201/455-4157	/ /
102	Nickel Based Brazing Alloy Foi	N/A	Allied	Alloy (foil)	201/455-4157	05/01/89
103	Sodium Metabisulfite	N/A	Allied		201/455-4157	05/01/85
104	Sulfuric Acid	N/A	Allied	Acid	201/455-4157	11/01/77
105	Toluene	N/A	Allied		201/455-4157	10/01/78
106	Winsor Lube L-245X	Fatty diester and additives	Allied Kelite	Lubricant	203-342-0660	06/13/89
107	Cemented T.C. Grades	Tungsten Carbide 56-97%	Allied Machine & Engr.	Abrasive	216/339-2250	11/25/85
108	Spade Drill, H.S.S. Cutting To	N/A	Allied Machine & Engr.	Abrasive	216/339-2250	11/25/85
109	Acetone	N/A	Allied Signal	Abrasive	201/455-4157	05/01/89
110	Potassium Hydroxide, Pellet	N/A	Allied Signal	Alkali	201/455-2000	11/01/77
111	Tungsten Carbide Grades	TungstenCarbide mixed w/cobalt	Allied Tool	Metal Removal	414/355-8280	11/22/85
112	Allison, Economiser	Pressed Rubber Wheel	Allison-Campbell	Abrasive	203/929-5301	/ /
113	Allison, Economiser	Rubber Bonded Wheel	Allison-Campbell	Abrasive	203/929-5301	/ /
114	Allison, Challenger, Economise	Resin Bonded Wheel	Allison-Campbell	Abrasive	203/929-5301	/ /
115	Amdry 962 Plasma Spray Powder	Nickel Base Alloy	Alloy	Metal Powder	313/288-1200	03/25/86
116	Amdry 939	Nickel	Alloy	Brazing Powder	313/288-1200	07/08/86
117	Amdry 760:Nickel Base-Braz Pow	Ni 74%, Cr 14%	Alloy Metals	Alloy	313/288-1200	03/19/86
118	Almco 2250	Potassium Hydroxide 4%	Almco		507/377-2102	11/22/85
119	Aluminum (Plate)	N/A	Alumax	Alloy	714/683-0140	11/25/85
120	Alodine 1201	N/A	Amchem/Henkel	Acid	215/628-1364	05/15/89
121	ABC Dry Chemical	Muscovite Mica, Silica	Amerex		205/655-3271	06/22/88
122	Carbon Dioxide	N/A	Amerex	Gas	205/655-3271	06/22/88
123	AFFF Liquid Foam Concentrate	N/A	Amerex	Charger	205/655-3271	06/22/88
124	Anti-Freeze Charge	Potassium Carbonate/Acetate	Amerex	Charger	205/655-3271	06/22/88
125	FFFP Liquid Foam Concentrate	N/A	Amerex	Charger	205/655-3271	06/22/88
126	Graphite Dry Powder G Plus	Magnes Alum Silicate, Graphite	Amerex		205/655-3271	10/03/88
127	Halon 1211	Bromochlorodifluoromethane	Amerex		205/655-3271	02/10/89
128	Monnex Dry Chemical	PID, Mica, Silica, Carbon	Amerex		205/655-3271	06/22/88
129	Purple K Dry Chemical	N/A	Amerex		205/655-3271	06/22/88
130	RTV Footstand Adhesive	Acetoxysilane	Amerex	Adhesive	205/655-3271	06/22/88
131	Regular Dry Chemical	Sodium Bicarbonate	Amerex	Cleaner	205/655-3271	06/22/88
132	Solid AFFF Foam Cartridge	N/A	Amerex		205/655-3271	06/22/88
133	Super D Dry Powder	N/A	Amerex		205/655-3271	06/22/88

134	Viscosine Type 31	Naphth Oil50, Chlor Paraffin50	American Air Filter	Lubricant	502/637-0011	06/21/89
135	Merthiolate	Ethyl Alcohol 51%, Acetone 10%	American Caduceus	Cleaner	516/741-7100	/ /
136	Brazed Tungsten Carbide Tools	Tungsten Ccarbide 30-97%	American Carbide Tool	Abrasive	216/455-2009	11/25/85
137	Sodium Bichromate Crystals	Sodium Dichromate Dihydrate	American Chrome		512/883-6421	06/28/82
138	Sulfuric Acid	N/A	American Cyanamid	Acid	201/835-3100	08/06/82
139	Leak-Tec 372E	N/A	American Gas & Chem.		201/767-7300	05/18/89
140	Leak-Tec 16-OX	mixture	American Gas and Chemical Co.		201-767-7300	05/18/89
141	Ink Jet Printing Fluid	Polyol	American Ink	Ink	617/935-4475	/ /
142	Tap Magic Cutting Fluid	Hydrocarbon Mixture	American Interplex Corp.	Cutting Fluid	501-224-5060	/ /
143	Aircraft Lube Oil	Polyol Ester	American Oil	Oil, aircraft lube	201/589-0250	/ /
144	Lenox Band Saw Blades	Steel	American Saw and Mfg Co.	Saw Blade	413-5253961	06/26/87
145	Copper Sulfate	N/A	Americhem	Inorganic Salt	215/335-0990	02/29/88
146	Kadel E-1140	Fiberglass, polyketone	Amoco		312/856-3304	04/26/88
147	NT-45 Process Oil	Hydrocarbons	Amoco Oil Co.	Metalworking Fluid	312-856-5371	12/08/87
148	Amodex Hand Cleaner 1-0079	N/A	Amodex Products	Cleaner	203/335-1255	/ /
149	Glaze Off	Mineral Spirits 66/3 50-60%	Anchor/Lithkemko	Cleaner	904/264-3500	10/05/88
150	Pam X Red	N/A	Anchor/Lithkemko	Cleaner	904/264-3500	06/23/89
151	Winsor L110	Mineral Oil	Anderson	Solvent, hydrocarbon	312/767-8447	07/10/90
152	Winsor Rust Preventative 1161X	Mineral Oil Corrosion Inhib.	Anderson Oil	Rust Preventive	203/342-0660	/ /
153	Windsor Lube L-245X	Diester Lubricant Base	Anderson Oil and Chemical Co.	Metalworking Fluid	203-342-0660	04/28/86
154	Slikwik Absorbent Soc	N/A	Andersons	Ceramic	419/893-5050	01/02/87
155	Foray Dry Chem. Exting Agent	Monoammonium Phosphate >75%	Ansul	Fire Protection	715/735-7411	06/01/86
156	Met-L-Kyl Dry Chem. Exting Age	Sodium Bicarbonate >60%	Ansul	Fire Protection	715/735-7411	06/01/86
157	Met-L-X Dry Powder Exting Agen	Sodium Chloride >85%	Ansul	Fire Protection	715/735-7411	06/01/86
158	Lith-X Dry Powder Exting Agent	Graphite >90%	Ansul	Fire Protection	715/735-7411	06/01/86
159	Plus-Fifty C Dry Chem. E. Agen	Sodium Bicarbonate >90%	Ansul	Fire Protection	715/735-7411	06/01/86
160	Na-X Dry Powder Exting Agent	Sodium Carbonate >85%	Ansul	Fire Protection	715/735-7411	06/01/86
161	985-P14 Fluores Dye Penetrant	Distillate, hydro. middle	Ardrox		714/739-2821	06/01/89
162	Ardrox 9D4A	Magnesium Oxide,Pentaerythrito	Ardrox		714/739-2821	04/03/89
163	Ardrox 9D6/D495A	1,1,1-Trichloroethane	Ardrox		714/739-2821	01/02/90
164	Ardrox 9PR-12 Emulsifier	Diethylene Glycol	Ardrox		714/739-2821	04/03/89
165	Ardrox 9PR551/K410C	1,1,1-Trichloroethane	Ardrox		714/739-2821	09/27/88
166	Ardrox PC L610	Dichloromethane	Ardrox		714/739-2821	01/03/89
167	Tracer Tech P-135D	Distillate, hydro. middle	Ardrox		714/739-2821	06/01/89
168	985-P14 Fluorescent Dye	mixture	Ardrox Inc.	Dye penetrant	800-424-9300	06/01/89
169	MP-164	Distillates,refined paraffinic	Argent	Oil, petroleum	313/427-5533	05/14/87
170	Rigidax WI	N/A	Argueso		914/698-8500	05/28/86
171	Stainless Steel Products	Steel, stainless	Armco	Alloy	513/425-2964	10/01/85
172	Titanium Alloys: 11 MSDS	Titanium	Armco	Alloy	513/425-5864	10/15/89
173	CP-06968V Non Drying ZnCr Pain	Xylene	Armitage	Paint Product	201/402-9000	04/02/90
174	EB-02359V Epoxy Catalyst	Xylene, Methyl Isobutyl Ketone	Armitage	Epoxy Component	201/402-9000	06/14/90
175	EB-07961V Epoxy Varnish Catal	Xylene	Armitage	Paint Product	201/402-9000	12/05/86
176	EA-07365V Blue Adh Epoxy A	Xylene	Armitage	Epoxy Component	201/402-9000	05/10/90
177	EA-02833V E Gray Epoxy EnamelA	Petroleum Distillate, Xylene	Armitage	Epoxy Component	201/402-9000	06/14/90
178	EA-07961V Clear Epoxy Varn A	Xylene	Armitage	Paint Product	201/402-9000	12/05/86

179	EB-07961 Epoxy Catal Varnish	Xylene	Armitage	Paint Product	201/402-9000	11/08/86
180	EB-07365V Blue Epoxy B	Xylene	Armitage	Epoxy Component	201/402-9000	05/10/90
181	TH-00299V Epoxy Thinner	Toluene, PGME	Armitage	Solvent	201/402-9000	04/05/90
182	TH-00131A Xylol	Xylene	Armitage	Solvent	201/402-9000	05/10/90
183	TH-00299 Epoxy Thinner	Toluene	Armitage	Paint Product	201/402-9000	11/07/86
184	Investment Castings	Beryllium-Copper+Chrome Copper	Arwood	Alloy (casting)	207/767-0600	01/10/86
185	Investment Castings	Nickel	Arwood	Alloy	201/767-0600	01/10/86
186	Investment Castings	Copper+Manganese-Copper Based	Arwood	Alloy (casting)	207/767-0600	01/10/86
187	Invetsment Castings	Leaded-Zinc-Copper Based Alloy	Arwood	Alloy (casting)	207/767-0600	01/10/86
188	Investment Castings	Aluminum Alloys	Arwood	Alloy (casting)	201/767-0600	01/10/86
189	Investment Castings	Steel,carbon/Low-Hi Alloy/Tool	Arwood	Alloy	201/767-0600	01/10/86
190	Investment Castings	Steel, stainless	Arwood	Alloy	201/767-0600	01/10/86
191	Investment Castings	Magnesium Alloys	Arwood	Alloy (castings)	201/767-0600	01/10/86
192	Investment Castings	Cobalt	Arwood	Alloy (casting)	201/767-0600	01/10/86
193	Mineral Spirits Nonexempt	Mineral Spirits	Ashland	Solvent	606/324-1133	03/01/81
194	Nitric Oxide	Nitric Oxide	Ashland	Gas	201/754-7700	11/25/85
195	Tectyl 910A	Aliphatic Petroleum Distillate	Ashland	Rust Preventative	606/324-1133	06/23/85
196	Tectyl 900	Aliphatic Petroleum Distillate	Ashland	Rust Preventative	606/324-1133	12/22/88
197	Tectyl 502C	Aliphatic Petroleum Distillate	Ashland	Rust Preventative	606/324-1133	01/01/87
198	Carbon Steel-700 Series Alloy	Steel, carbon	Atlas	Alloy	206/475-4600	10/01/85
199	Alloy Steel-800 Series Alloy	Steel	Atlas	Alloy	206/475-4600	10/01/85
200	Nickel Base-500 Series Alloy	Steel, nickel	Atlas	Alloy	206/475-4600	10/01/85
201	Stainless Steel-900 Series	Steel, stainless	Atlas	Alloy	206/475-4600	10/01/85
202	Unichrome Strip Salt 80-X	Mixture	Atochem North America	Stripper	201-738-3099	05/17/89
203	All Carbide Grades	TungstenCarbide mixed w/cobalt	Atrax	Metal Removal	617/531-7132	11/05/85
204	Cemented Carbide:Co,Ni,BrazToo	Tungsten Carbide 41-97%	Atrax	Abrasive	501/636-0349	09/01/89
205	????????	Ethylene Dichloride	Aurora	Adhesive	312/859-2030	03/16/88
206	Bearings:RodEnd,Spher,MountBal	N/A	Aurora	Alloy	312/859-2030	03/16/88
207	Carbon/Stainless Steel	Steel, carbon/stainless	Aurora	Alloy	312/859-2030	03/16/88
208	Black Oxide	N/A	Aurora	Alloy	312/859-2030	03/16/88
209	Adhesive	MEK, Ethyl alcohol	Aurora	Adhesive	312/859-2030	03/16/88
210	Cadmium Plating	Cadmium	Aurora	Alloy	312/859-2030	03/16/88
211	Grease #2	Grease	Aurora	Lubricant	312/859-2030	03/16/88
212	Chrome Plating	Chromium	Aurora	Alloy	312/859-2030	03/16/88
213	Dry Film Lubricant	MEK,Xylene,Toluene,n-Butyl Alc	Aurora	Lubricant	312/859-2030	03/16/88
214	Nickel Plating	Nickel	Aurora	Alloy	312/859-2030	03/16/88
215	Zinc Plating	N/A	Aurora	Alloy	312/859-2030	03/16/88
216	Woven Nylon Teflon Liner	N/A	Aurora	Insulation	312/859-2030	03/16/88
217	Autobags,Autosleeves,Zipvelope	N/A	Automated Packaging Systems	Packaging	216/425-4242	11/01/85
218	Carbon, Alloy, and Tool Steels	Steel	Avondale	Alloy	414/387-3000	11/21/85
219	Die Set Lube 2696-A	Petroleum Hydrocarbon	Avondale	Lubricant	414/387-3000	04/14/86
220	Aqua Ammonia	Ammonium Hydroxide	Axton Cross		617/429-6766	02/01/87
221	B&B 786RE	Sodium Silicate	B&B Chemical Company Inc.		305-888-5247	05/01/87
222	Alpha-Cryl Colors/AT Bases	Xylene: No lead	BASF	Paint Product	419/877-5308	12/19/89
223	850 Universal Flatting Concent	Xylene	BASF	Paint Product	419/877-5308	12/18/89

224	B & B 3100	Solvent Blend, aromatic	BB	Cleaner	305/888-5247	10/01/77
225	BCS L-33,L-33C	Sodium Nitrite	BCS	Cleaner	203/923-9575	11/01/85
226	BCS L-883 & L-885	N/A	BCS	Cleaner, liquid	203/923-9575	/ /
227	BCS L-36	N/A	BCS	Cleaner	203/923-9575	06/01/86
228	BCS ND-2D	Triethanolamine,sodium nitrite	BCS	Cleaner	203/923-9575	05/01/86
229	Proprietary Solvent 83-200	Ethyl Alcohol	BP	Solvent		08/28/89
230	Group 5A	RespirableNuisanceDust,PhosAci	Babcock & Wilcox	Insulation	404/796-4200	10/07/85
231	Group 5B	RespirableNuisanceDust,PhosAci	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
232	Group 6	Respirbale Nuisance Dust	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
233	Group 9B	RespirableNuisanceDust,graphit	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
234	Group 3	Respirable Nuisance Dust	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
235	Group 5	N/A	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
236	Group 4	Respirbale Nuisance Dust	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
237	Group 7	N/A	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
238	Group 8	N/A	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
239	Group 16	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
240	Group 22	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/21/85
241	Group 2	Respirable Nuisance Dust	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
242	Group 25	Aluminoborosilicate (3/4)	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
243	Group 15	Aluminosilicate, chrome	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
244	Group 18	Fiber,refractory ceramic	Babcock & Wilcox	Insulation	404/796-4200	10/10/85
245	Group 23	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
246	Kaowool Blanket 2300	Aluminosilicate fiber	Babcock & Wilcox	Insulation	404/796-4200	05/04/83
247	Group 10	N/A	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
248	Kaowool Rigidizer: Group 21	Silicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
249	Group 14	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
250	Group 13	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
251	Group 12	Fiber,refractory ceramic	Babcock & Wilcox	Insulation	404/796-4200	09/24/85
252	Group 17	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
253	Group 1	Respirable Nuisance Dust	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
254	Group 11	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
255	Unikote M+S: Group 24	Aluminosilicate	Babcock & Wilcox	Insulation	404/796-4200	10/01/85
256	Kaowool Cement A+B: Group 20	Aluminosiliacte	Babcock and Wilcox	Insulation	404/796-4200	10/01/85
257	Kaowool Tamping Mix: Group 19	Aluminosilicate	Babcock and Wilcox	Insulation	404/796-4200	10/01/85
258	Group 9	Respirable Nuisance Dust	Babcock and Wilcox	Brick	404/796-4200	10/01/85
259	Boric Acid	N/A	Baker	Acid	201/859-2151	09/26/85
260	Ammonium Persulfate	N/A	Baker		201/859-2151	03/09/89
261	Aniline	N/A	Baker		201/859-2151	10/02/85
262	Citric Acid, anhydrous	N/A	Baker	Acid	201/859-2151	03/09/89
263	Cupric Sulfate, 5-Hydrate	N/A	Baker		201/859-2151	10/19/85
264	Ferric Chloride	N/A	Baker		201/859-2151	10/09/85
265	N-Heptane	N/A	Baker		201/859-2151	09/24/85
266	O-Dichlorobenzene	N/A	Baker		201/859-2151	10/02/85
267	Sodium Chloride	N/A	Baker	Salt	201/859-2151	03/09/89
268	Sodium Hydroxide	N/A	Baker	Caustic	201/859-2151	03/09/89

269	Selenium Dioxide	N/A	Baker	Cleaner, metal	201/859-2151	08/08/89
270	Potassium Persulfate	Potassium Persulfate	Baker	Oxidizer	201/859-2151	10/04/88
271	Styrene (stablilized)	N/A	Baker		201/859-2151	10/17/88
272	Titanium Nitride Coating	Titanium	Balzers Tool Coating	Coating	716/694-6012	11/01/85
273	Titanium Nitride Coating	Titanium Nitride	Balzers Tool Coating	Coating	716-694-6012	11/01/85
274	Titanium Nitride Coating	Titanium Nitride	Balzers Tool Coating Inc.	Coating	716/694-6012	11/01/85
275	Diamond/CBN Abrasive Products	N/A	Bay State	Abrasive	508/366-4431	12/31/86
276	Diamond/CBN Grinding Wheel	Diamond/Cubic Boron Carbide	Bay State	Abrasive	617/366-4431	11/14/85
277	Gritcloth:2 Open Mesh Abra Clo	Sili Carbi/Alum Oxide +20%each	Bay State	Abrasive	508/366-4431	02/12/86
278	Resin Bonded Silicon	Resinoid Silicon Carbide	Bay State	Abrasive	617/366-4431	11/14/85
279	Rubber Silicon Carbide Abr Pro	Silicon Carbide +50%	Bay State	Abrasive	508/366-4431	05/10/88
280	Resin Bonded Aluminum	Resinoid Aluminum Oxide	Bay State	Abrasive	617/366-4431	11/14/85
281	Resinoid Silicon Carbide Abr P	Silicon Carbide +50%	Bay State	Abrasive	508/366-4431	04/07/89
282	Rubber Bonded AlumOxide AbrPro	Aluminum Oxide +50%	Bay State	Abrasive	508/366-4431	05/10/88
283	Rubber Bonded Aluminum	Rubber Bonded Aluminum Oxide	Bay State	Abrasive	617/366-4431	11/14/85
284	Rubber Bonded Silicon	Rubber Silicon Carbide	Bay State	Abrasive	617/366-4431	11/14/85
285	Resinoid AlumOxide Abras Produ	Aluminum Oxide +50%	Bay State	Abrasive	508/366-4431	04/07/89
286	Vitrified AlumOx Abrasive Prod	Aluminum Oxide Abrasive +50%	Bay State	Abrasive	508/366-4431	12/31/86
287	Vitreous Bonded Alumina	Vitrified Aluminum Oxide	Bay State	Abrasive	617/366-4431	11/14/85
288	Vitreous Bonded Silicon	Vitrified Silicon Carbide	Bay State	Abrasive	617/366-4431	11/14/85
289	Vitrified Silicon Carbide Ab P	Silicon Carbide +50%	Bay State	Abrasive	508/366-4431	12/31/86
290	Diamond Wheel CBN Wheel	Diamond or Cubic Boron Nitride	Bay State Abrasives	Abrasive Wheel	508-366-4431	12/31/86
291	Gritcloth	Silicon Carbide Abrasive Cloth	Bay State Abrasives	Abrasive	508-366-4431	02/12/86
292	Rubber Bonded Abrasive Product	Rubber/Aluminum Oxide	Bay State Abrasives	Abrasive	617-366-4431	11/14/85
293	Resin Bonded Silicon	Resinoid Silicon Carbide	Bay State Abrasives	Abrasive	508-366-4431	12/31/86
294	Rubber Bonded Silicon	Rubber Silicon Carbide	Bay State Abrasives	Abrasive	508-366-4431	05/10/88
295	Rubber Bonded Aluminum	Rubber Bonded Aluminum Oxide	Bay State Abrasives	Abrasive	508-366-4431	05/10/88
296	Resin Bonded Aluminum	Resinoid Aluminum Oxide	Bay State Abrasives	Abrasive	508-366-4431	12/31/86
297	Plastic Bonded Aluminum Oxide	Resinoid Aluminum Oxide	Bay State Abrasives	Abrasive	508-366-4431	12/19/88
298	Plastic Bonded Silicon Carbide	Resinoid Silicon Carbide	Bay State Abrasives	Abrasive	508-366-4431	12/19/88
299	Vitreous Bonded Silicon	Vitrified Silicon Carbide	Bay State Abrasives	Abrasive	508-366-4431	12/31/86
300	Vitreous Bonded Alumina	Vitrified Aluminum Oxide	Bay State Abrasives	Abrasive	508-366-4431	12/31/86
301	Carbide Cemented Coated Tools	Carbide	Bay State Carbide Products	Cement or Coating	603-335-2111	05/07/90
302	CDA182..954,AMPCO12..25,SAE...	Copper	Bearing Bronze	Alloy (bearing)	216/641-6520	11/25/85
303	Anti-Static Spray	Alkyl Quat Ammo Salt,Alc & Wat	Benjamin	Cleaner	516/753-0700	/ /
304	Screen Cleaner	Alkyl Quat Ammo Salt,Alc & Wat	Benjamin	Cleaner	516/753-0700	11/30/87
305	Brass Babbitts	Tin,lead	Bethlehem	Alloy (babbitt)	215/694-5105	11/01/85
306	Alloy Steel Grades	Steel, alloy	Bethlehem	Alloy	215/694-5105	11/01/85
307	Cast Iron Products	Iron	Bethlehem	Alloy	215/694-5105	11/01/85
308	Galvalume/Bethalume Steel Prod	Steel, galvanized	Bethlehem	Alloy	215/694-5105	11/01/85
309	Cast Bronze Products	Steel,copper	Bethlehem	Alloy	215/694-5105	11/01/85
310	Galvanized Steel Products	Steel, galvanized	Bethlehem	Alloy	215/694-5105	11/01/85
311	Mild Steel Grades	Steel	Bethlehem	Alloy	215/694-5105	11/01/85
312	Low Alloy Steel Grades	Steel, alloy	Bethlehem	Alloy	215/694-5105	11/01/85
313	Inconel Steel	Steel	Bethlehem	Alloy	215/694-5105	11/01/85

314	Ingot Mold	Steel	Bethlehem	Alloy	215/694-5105	11/01/85
315	Leaded Steel Grades	Steel, leaded	Bethlehem	Alloy	215/694-5105	11/01/85
316	Steel Foundry Products	Steel	Bethlehem	Alloy	215/694-5105	11/01/85
317	Stainless Steel	Steel, stainless	Bethlehem	Alloy	215/694-5105	11/01/85
318	Steel Forgings	Steel	Bethlehem	Alloy	215/694-5105	11/01/85
319	Tin-Coated Steel Products	Steel, tin	Bethlehem	Alloy	215/694-5105	11/01/85
320	Tool Steel	Steel, tool	Bethlehem	Alloy	215/694-5105	11/01/85
321	Intercoat Bonding Agent 2	Propylene Glycol Meth.Eth.Acet	Bio-Lab	Resin, epoxy	404/378-1753	06/30/86
322	Jurex Accelerator	Dibutyltin dilaurate	Bio-Lab	Urethane	404/378-1753	06/30/86
323	Jurex Floor Coating 213 Clear	Castor Oil, modified (Polyol)	Bio-Lab	Coating, floor	404/378-1753	06/30/86
324	Jurex Thinner	Propylene Glycol Meth.Eth.Acet	Bio-Lab	Solvent	404/378-1753	06/30/86
325	Intercoat Bonding Agent 1	Ethyl Alcohol	Bio-Lab	Curing Agent, epoxy	404/378-1753	06/30/86
326	Aluma Black A15	Water >87%	Birchwood Casey	Dilute Aqueous Acid	612/937-7940	11/01/88
327	Grinding Wheel	N/A	Blanchard	Abrasive	617/868-8210	/ /
328	Blasocut 4000 Strong	Mineral Oil, hydrotreat 30-50%	Blaser	Coolant, Metal Worki	914/294-3200	02/01/90
329	Blasocut 3000 Ferro,Art.Nr.873	Mineral Oil	Blaser	Fluid, cutting	914/997-6931	/ /
330	Krylon Fluorescent Spray Paint	Hexane,heptane,isobutane	Borden	Paint Product	614/457-5200	11/25/85
331	Krylon Penetrating Oil	1,1,1-Trichloroeth.	Borden	Oil, penetrating	614/457-5200	11/22/85
332	Krylon Int/Ext Enamel or Engin	Acetone	Borden	Paint Product	614/457-5200	12/04/85
333	Krylon In/Ext: 1501-2505	Acetone, MEK	Borden	Spray Paint	614/431-6600	12/04/88
334	Krylon 1348 Sili Spra Mold Rel	Hexane	Borden	Paint Product	614/457-5200	11/25/85
335	Krylon Int. Ext. Enamel	paint	Bordon	paint	614-431-6600	12/04/86
336	Krylon Int./Ext. Enamel	Spray Paint Aerosol	Bordon	Spray Paint	614-431-6600	06/19/86
337	Vitreus Bonded Alumina	Vitrified Aluminum Oxide	Boride	Abrasive	616/946-2100	11/01/85
338	Tin 96.5% Silver 3.5% Alloy	Tin, silver	Bow	Alloy	201/686-6040	/ /
339	Alloy Steel	Steel	Bowsteel	Alloy	203/688-8393	11/01/87
340	Bowsteel Alloys	Steel	Bowsteel	Alloy	800/641-4140	/ /
341	Stainless Steel	N/A	Bowsteel	Alloy	203/688-8393	11/01/87
342	Braemow Aisi M-2	Steel, tool	Braeburn	Alloy	412/224-6900	11/20/85
343	Braevan Aisi M-3 (Type 1)	Steel, tool	Braeburn	Alloy	412/224-6900	11/20/85
344	Boric Acid	N/A	Brand-NU Labs	Acid	614/889-3333	09/01/88
345	Hydrochloric Acid Re Acs 6X6#	N/A	Brand-NU Labs	Acid	614/889-3333	04/10/89
346	Brayco Micronic 762	N/A	Bray	Fluid, hydraulic	213/575-1212	02/01/79
347	Brayco Micronic 772	Tricresyl Phosphate (TCP)	Bray	Fluid, hydraulic	213/575-1212	/ /
348	Jennison-Wright Lamilite Adhes	Acetate, polyvinyl	Brooks	Adhesive	617/828-1150	03/11/87
349	Potassium Permanganate	N/A	Browning	Salt, inorganic	212/867-0600	11/25/85
350	Permanganate of Potash	Potassium Permanganate	Browning	Inorganic Salt	212/867-0600	11/25/85
351	Tool Steel	Steel	Brubaker Tool Corporation	Steel		11/01/85
352	Bruning PD Activator	Ethylene Glycol	Bruning	Glycol	203/453-5294	03/07/86
353	PD Activator 28-80,110,111,222	Ethylene Glycol	Bruning	Activator,developer	203/453-5294	10/21/85
354	Alloy 165, UNS No. C17000	Beryllium Copper	Brush Wellman	Alloy	419/862-2745	10/08/85
355	Alloy 10, UNS No. C17500	Beryllium Copper	Brush Wellman	Alloy	419/862-2745	10/08/85
356	Alloy 25,190,UNS No. C17200	Beryllium Copper	Brush Wellman	Alloy	419/862-2745	10/08/85
357	Fuel Oil 4	N/A	Buckley	Lubrcant	203/336-3541	/ /
358	Aluminum Oxide Grinding Wheels	N/A	Bullard	Abrasive	617/366-4465	/ /

359	Silicon Carbide Grinding Wheel	N/A	Bullard	Abrasive	617/366-4465	/ /
360	Penetrox A	Grease(non-toxic),zinc(non-tox	Burndy	Lubricant	203/838-4444	11/14/84
361	Busch R-540 Oil	Petroleum Distillates	Busch	Lubricant	804/463-7800	01/03/90
362	Busch R-580 Oil	N/A	Busch	Lubricant	804/463-7800	01/03/90
363	Busch R-590 Oil	Mineral Oil 95-99.99%	Busch	Lubricant	804/463-7800	01/03/90
364	Busch R-530 Oil	Petroleum Distillates 95-99.9%	Busch	Lubricant	804/463-7800	01/03/90
365	Norway Saltpeter	Ammonium Nitrate	C-I-L		416/226-6117	/ /
366	Hydrochloric Acid	N/A	CIL	Acid	203/323-3500	11/01/86
367	Diamond Tool	Diamond	CITCO	Tool	216/285-9181	11/20/85
368	Grinding Wheel	Diamond/CBN Resin Bond	CITCO	Abrasive	216/285-9181	11/20/85
369	Cast Copper Diamond Tool	Diamond, cast copper	CITCO	Tool	216/285-9181	03/14/88
370	Grinding Wheel	Diamond/CBN Metal Bond	CITCO	Abrasive	216/285-9181	11/20/85
371	Diamond Rotary/Block Dresser	N/A	CITCO	Resurfacer	216/285/9181	11/20/85
372	Polycrystalline Cutting Tool	Polycrystalline	CITCO	Tool, cutting	216/285-9181	11/20/85
373	TungstenCarbide mixed w/Cobalt	N/A	CJT	Metal Removal	312/543-7144	11/25/85
374	Easco Low Aro-30	Petroleum Hydrocarbon Distilla	CLC Lubricants	Lubricant	312/232-7900	05/03/89
375	Copper Cyanide	N/A	CP	Cyanide	201/636-4300	09/01/85
376	Cyanide of Soda	Sodium Cyanide	CP	Cyanide	201/636-4300	08/01/88
377	Sodium Dichromate, Anhydrous	N/A	CP		201/636-4300	09/01/85
378	Copper Cyanide	Cuprous Cyanide	CP Chemicals Inc.	Plating	201-636-4300	/ /
379	3-36 (Bulk) 3006,3009,3011	Petroleum Distillate	CRC		215/674-4300	11/01/85
380	Cab-O-Sil	Amorphous Silica	Cabot		215/921-5000	11/01/81
381	High Perform Heat Resis Alloys	Steel:C300	Cabot	Alloy	215/921-5000	11/01/85
382	High Perform-Corros Resis Allo	Steel:C100	Cabot	Alloy	215/921-5000	11/01/85
383	High Nickel Alloys	Steel, nickel:N100	Cabot	Alloy	215/921-5000	11/01/85
384	High Perform-Heat Resis Alloys	Steel:C200	Cabot	Alloy	215/921-5000	11/01/85
385	High-Performance Alloys	N/A	Cabot	Alloy	215/921-5000	/ /
386	Nickel Alloys	N/A	Cabot	Alloy	215/921-5000	/ /
387	Super Satinless Steel Alloys	Steel, stainless	Cabot	Alloy	215/921-5000	11/01/85
388	Titanium/Titanium Alloys	Titanium	Cabot	Alloy	215/921-5000	11/01/85
389	Various	High Perform-Heat Resist Alloy	Cabot	Alloy	215/921-5000	11/01/85
390	Cadmium Copper RWMA Class 1	Copper,cadmium	Cadi	Alloy	203/574-0520	02/06/87
391	Beryllium Copper RWMA Class 4	Copper	Cadi	Alloy	203/574-0520	02/06/87
392	Beryllium Free Copper All-CL3	Copper	Cadi	Alloy	203/574-0520	02/06/87
393	Beryllium Copper RWMA Class 3	Copper	Cadi	Alloy	203/574-0520	02/06/87
394	Copper Tungsten	Tungsten, copper	Cadi	Alloy	203/574-0520	12/12/86
395	Copper CDA 110	Copper	Cadi	Metal	203/574-0520	12/12/86
396	Chrome Copper RWMA Class 2	Copper,chromium	Cadi	Alloy	203/574-0520	02/06/87
397	Molybdenum	Molybdenum	Cadi	Metal	203/574-0520	12/12/86
398	Zirconium Copper Alloy 910	Copper,zirconium	Cadi	Alloy	203/574-0520	12/12/86
399	Tungsten	N/A	Cadi	Metal	203/574-0520	12/12/86
400	R-50	Anionic Polymer	Calgon	Polymer	412/777-8000	08/10/84
401	"Defensite" Polyurethane 5350	Xylene	California	Polyurethane	617/887-5926	09/11/87
402	Defensite	Xylol	California	Urethane Clear Finis	617/547-5300	01/06/86
403	Ox-line Ruberol Latex Flat	paint	California Products Corp.	Latex Flat Paint	617-547-5300	08/18/87

404	Dielektrol I (DK I)	DEHP, 1-tetradecene	Capacitor	Capacitor	518/761-7322	11/25/85
405	Dielektrol V (DK V)	DEHP,PXE	Capacitor	Capacitor	518/761-7322	12/26/85
406	Kleen Sweep Sweeping Compound	oil base	Capital Soap Corp.	cleaner	201-779-8601	/ /
407	All Carbide Grades except 616	TungstenCarbide mixed w/cobalt	Carboloy	Metal Removal	313/497-5510	11/11/85
408	Carboloy Seco Cemented Carbide	Cemented Carbide Cobalt Bind.	Carboloy-Seco Tool Company	Cutting Tool	313-497-5510	02/14/89
409	All Class I Products	Papers,cloths	Carborundum	Abrasive	716/695-8120	/ /
410	Fiberfrax Yarn	Ceramic Fiber	Carborundum		716-278-2000	07/27/90
411	Carbon, activated	N/A	Carbtrol		203/226-5642	05/25/86
412	Model L-1 Canister	Carbon	Carbtrol		203-226-5642	05/25/86
413	Carbon Dioxide, Refrig Liquid	N/A	Cardox	Gas	415/977-6500	06/15/89
414	Standard Clear PVC Solvent Cem	MEK48-54, Tetrahydrofuran26-32	Carlon	Adhesive	303/623-5716	02/11/86
415	Richguard R-202 (A-side)	4,4-MDI	Carpenter Pack.	Insulation	804/233-8391	08/08/86
416	Richguard R-202 (B-side)	Polyalkyleneoxy Polyol Resin S	Carpenter Pack.	Resin	804/233-8391	08/08/86
417	Richguard-50G (A-side)	4,4-MDI	Carpenter Pack.	Insulation	804/233-8391	08/08/86
418	Richguard-50G (B-side)	Polyalkyleneoxy Polyol Resin S	Carpenter Pack.	Resin	804/233-8391	08/08/86
419	Richpak 70 (A-side)	4,4-MDI	Carpenter Pack.	Insulation	804/233-8391	08/08/86
420	Richpak R-150 (B-side)	Polyalkyleneoxy Polyol Resin S	Carpenter Pack.	Resin	804/233-8391	08/08/86
421	Richpak R-200 (A-side)	4,4-MDI	Carpenter Pack.	Insulation	804/233-8391	08/08/86
422	Richpak-70 (B-side)	Polyalkyleneoxy Polyol Resin S	Carpenter Pack.	Resin	804/233-8391	08/08/86
423	Richpak R-150 (A-side)	4,4-MDI	Carpenter Pack.	Insulation	804/233-8391	08/08/86
424	Custom 455 ELC HF OAG FORG QUA	Steel	Carpenter Tech.	Alloy	215/371-2000	11/01/85
425	Consumet Silicon Iron B HF ANL	Steel	Carpenter Tech.	Alloy	215/371-2000	04/07/87
426	Custom 450	Iron 75.5%, Chromium 15%	Carpenter Tech.	Alloy	215/371-2000	05/08/89
427	Custom 450 ESR	Iron	Carpenter Tech.	Alloy	215/371-2000	04/07/87
428	Custom 450 Stainless	Steel, stainless	Carpenter Tech.	Alloy	215/371-2000	11/01/85
429	Pyromet 625 Hi Temp Alloy	Nickel	Carpenter Tech.	Alloy	215/371-2000	11/01/85
430	Pyrowear 53	Fe 90%,Mo 3%,Cu 2%,Ni 2%,Cr 1%	Carpenter Tech.	Alloy	215/371-2000	05/08/89
431	Pyromet 718 Hi Temp Alloy	Nickel	Carpenter Tech.	Alloy	215/473-2000	12/23/85
432	Pyromet 355 Rotary Forged Equa	Steel	Carpenter Tech.	Alloy	215/371-2000	11/01/85
433	Pyromet 355 Hi Temp Alloy	Iron	Carpenter Tech.	Alloy	215/371-2000	01/10/86
434	Specialty Metals	N/A	Carpenter Tech.	Metals, specialty	215/371-2000	01/03/84
435	Silicon Iron	Iron 98%	Carpenter Tech.	Alloy	215/371-2000	05/08/89
436	Type 347 Forg Qual	Iron	Carpenter Tech.	Alloy	215/371-2000	01/19/86
437	Type 410 Forge Qual	Steel	Carpenter Tech.	Alloy	215/371-2000	04/21/86
438	Type 316 Forg Qual	Iron	Carpenter Tech.	Alloy	215/371-2000	01/16/86
439	Type 405 HF UNL Forge Qual	Iron	Carpenter Tech.	Alloy	215/371-2000	12/02/85
440	Waspaloy HF Unl Forge Qual	Nickel	Carpenter Tech.	Alloy	215/371-2000	03/24/88
441	Type 430 HF UNL Forge Qual	Iron	Carpenter Tech.	Alloy	215/371-2000	01/17/86
442	Vim/Var 4340 ANL RT Forge Qual	Ironl	Carpenter Tech.	Alloy	215/371-2000	04/03/86
443	Pyrowear 53 Alloy	Iron	Carpenter Technology	Alloy	215-371-2000	/ /
444	Globo Quad Oil	Naphth Lub Oil 36%,kerosene33%	Casten	Rust Preventive	312/525-2553	/ /
445	Aluminum Alloys	1XXX-7XXX :Leaded 2011 & 6262	Castle	Alloys	617/853-4500	11/25/85
446	Alloy Steel	N/A	Castle	Alloy	312/455-7111	11/25/85
447	Carbon Steel-HR & CR/Leaded	Steel	Castle	Alloy	312/455-7111	11/25/85
448	Bronze	Copper	Castle	Alloy	312/455-7111	11/25/85

449	Carbon Steel	N/A	Castle	Alloy	312/455-7111	11/25/85
450	Brass	Copper,zinc	Castle	Alloy	312/455-7111	11/25/85
451	Nickel Based Alloy Steel	N/A	Castle	Alloy	312/455-7111	11/25/85
452	Stainless Steel	N/A	Castle	Alloy	312/455-7111	11/25/85
453	Titanium	N/A	Castle	Alloy	312/455-7111	11/25/85
454	Brayco 460	Petroleum Hydrocarbons	Castrol	Lubricant-Jet Oil	714/660-9414	12/16/86
455	Come-Clean 900	Blend: various ingredients	Castrol	Cleaner	215/443-7080	09/11/89
456	Castrol Honilo 171	Petroleum Oil 70-100%	Castrol Industrial Central		312/454-1000	06/08/90
457	Van Straaten 708	Petroleum Oils 30-50%	Castrol Industrial Central		312/454-1000	05/23/89
458	Van Straaten 5510-R	Petroleum Oils 30-50%	Castrol Industrial Central		312/454-1000	04/25/89
459	Van Straaten 5468	Petroleum Oil 50-70%	Castrol Industrial Central		312/454-1000	04/25/89
460	Van Straaten 838	N/A	Castrol Industrial Central		312/454-1000	01/26/90
461	Van Straaten 5299-M	Petroleum Oil 70-100%	Castrol Industrial Central		312/454-1000	04/25/89
462	Van Straaten 5700	Petroleum Oil 50-70%	Castrol Industrial Central		312/454-1000	04/25/89
463	Van Straaten 653	Petroleum Oils 70-100%	Castrol Industrial Central		312/454-1000	06/08/90
464	Van Straaten 826	Diethanolamine 5-10%	Castrol Industrial Central		312/454-1000	05/23/89
465	Hyspin AWS 68	Petroleum Distllates 20-30%	Castrol Industrial East		215/443-7080	07/26/90
466	Hyspin AWS 32	Petroleum Distillates 70-100%	Castrol Industrial East		215/443-7080	07/26/90
467	TLS-996	Petroleum Distillates 5-10%	Castrol Industrial East		215/443-7080	04/12/90
468	Syntilo 2838	N/A	Castrol Industrial East		215/443-7080	03/08/90
469	Rustilo DW-924	Stoddard Solv,ButylCarbitol<5%	Castrol Metalworking	Rust Preventive	215/443-7080	01/12/89
470	Van Straaten Conditioner 11	5-chloro...CAS# 26172-55-4	Castrol Metalworking		215/443-7080	09/21/87
471	Pink Tergent	N/A	Cello	Cleaner	301/939-1234	10/14/88
472	A-418 High Temp Ceramic Coatin	Chromium Oxide, chromic	Ceramic	Coating	412/846-4000	12/07/87
473	Fusible, Low Melt Alloys	N/A	Cerro	Alloy	814/355-6370	04/16/90
474	Aqua-Sol	Sodium Metasilicate Pentahydra	Certified Labs		214/438-0286	/ /
475	Grrr		Certified Labs	Liquid, semi-viscous	214/438-0286	/ /
476	Saf-Sol 20/20	Aliphatic Petroleum Distillate	Certified Labs	Hydrocarbon	214/438-0286	06/01/84
477	Workable Matte Fixative 40-002	Chartpak Matte Fixative	Chartpak Matte?	Adhesive	213/321-4220	03/25/90
478	Nickel Based Alloy Castings	Nickel	Chemical Milling	N/A		/ /
479	Ammonium Bifluoride	N/A	Chemtech	Acid Salt	314/966-9900	07/10/86
480	Styles 1774,2073,2074	N/A	Chesterton	Synthetic Yarn	617/438-7000	05/01/86
481	SRI Grease 2	refined oil	Chevron	base oil	415-233-3737	07/21/88
482	CGL 1330	Formulated Epoxy Resin	Ciba-Geigy	Pre-Cat Preimp Fabri	517/351-5900	09/26/89
483	Araldite AW 106	Epoxy Adhesive Resin	Ciba-Geigy	Epoxy	517/351-5900	08/16/89
484	DW 0133 Resin	Epoxy	Ciba-Geigy	Red Color Paste	517/351-5900	08/16/89
485	DW 0137 Resin	Epoxy	Ciba-Geigy	Black Color Paste	517/351-5900	08/16/89
486	DW 0135 Resin	Epoxy	Ciba-Geigy	Blue Color Paste	517/351-5900	08/16/89
487	DW 0132 Resin	Epoxy	Ciba-Geigy	Yellow Color Paste	517/351-5900	08/16/89
488	Hardener HV 953	Polyamide/Amine	Ciba-Geigy	Adhesive Hardener	517/351-5900	12/10/88
489	RP 3270 Hardener	Amine	Ciba-Geigy	Casting Hardener	517/351-5900	05/30/89
490	RP 3270 Resin	Epoxy	Ciba-Geigy	Laminating Resin	517/351-5900	08/16/89
491	RP 6405 Hardener	Polyurethane	Ciba-Geigy	Polyol	517/351-5900	12/10/88
492	RP 3269 Resin	Epoxy	Ciba-Geigy	Casting Resin	517/351-5900	08/16/89
493	RP 6414 Hardener	Amine	Ciba-Geigy	Polyurethane	914/347-4700	05/31/88

494	RP 6414 Resin	Isocyanate	Ciba-Geigy	Urethane	517/351-5900	06/01/89
495	Pramitol 25E	Prometon	Ciba-Geigy	Herbicide	800/334-9748	03/12/85
496	Pur-Fect Tool I Hardener	Polyol	Ciba-Geigy	Polyurethane Casting	517/351-5900	11/09/89
497	RP 6422 Resin	Isocyanate	Ciba-Geigy	Polyurethane	517/351-5900	06/01/89
498	RP 78 Parting Agent	Silicones	Ciba-Geigy	Release Agent	517/351-5900	12/15/89
499	RP 3269 Hardener	N-(2-Aminoethyl)-1,2-ethanedia	Ciba-Geigy	Hardener	517/351-5900	05/30/89
500	RP 79 Parting Agent	Release Agent	Ciba-Geigy	Fluoropolymer	517/351-5900	12/15/89
501	RP 803	Wax Dispersion	Ciba-Geigy	Release Agent	517/351-5900	11/13/89
502	R 380 B	N/A	Ciba-Geigy	Polyamide	517/351-5900	01/01/79
503	R-380A	Asbestos	Ciba-Geigy	Epoxy	517-351-5900	/ /
504	RP 1129 Hardener	Amine	Ciba-Geigy	Surface Coat Hardene	517/351-5900	05/30/89
505	RP 1129 Resin	Epoxy	Ciba-Geigy	Surface Coat Resin	517/351-5900	08/16/89
506	RP 6422 Hardener	Amine	Ciba-Geigy	Polyurethane	517/351-5900	12/09/88
507	RP 6405 Resin	Isocyanate	Ciba-Geigy	Polyurethane	517/351-5900	06/01/89
508	RP 6414-1 Hardener	Amine	Ciba-Geigy	Polyurethane	517/351-5900	12/09/88
509	Ren Shape 450	Cured Polyurethane	Ciba-Geigy	Modelign Stock	517/351-5900	12/10/88
510	TDT 186-1 Resin	Isocyanate	Ciba-Geigy	Clear Castable Ureth	517/351-5900	06/01/89
511	TDT 186-1 Hardener	Isocyanate	Ciba-Geigy	Urethane, clear cast	517/351-5900	06/01/89
512	Ren Shape (R) 450	Cured Polyurathane	Ciba-Geigy Corperation		800-888-8372	12/10/88
513	TDT 178-34 Additive	Phthalate Plasticizer	Ciba-Geigy Corperation	Polyurethane Plastic	517-351-5900	02/20/90
514	TDT 178-34 Resin	Isocyanate	Ciba-Geigy Corperation	Polyurethane Resin	517-351-5900	06/01/89
515	Copper Sulfate	Copper Sulfate Pentahydrate	Cities	Inorganic Salt	404/261-9100	/ /
516	Sodium Metabisulfite, Anhydrou	N/A	Cities		404/261-9100	/ /
517	C83450...C99750	Copper	Cleveland	Alloy (casting)	216/391-9494	11/25/85
518	Clevite F-153 and F-154	Alum-Sili-Cadm Alloy	Clevite	Alloy	216/481-7221	03/25/86
519	Clevite 66 and 85	Alum-Lead Alloy,SteelBack ALA	Clevite	Alloy	216/481-7221	03/25/86
520	Lead Base Alloy	Lead, antimony	Clevite	Alloy	216/481-7221	03/25/86
521	Leaded Bronze Powder	Copper,lead	Clevite	Alloy	216/481-7221	08/27/86
522	Tin Base Babbitt	Tin	Clevite	Alloy	216/481-7221	07/24/86
523	Formula 409 All Purpose Cleane	Ethylene Glycol Monobutyl Ethe	Clorox	Cleaner	415/847-6100	08/01/87
524	Cogemicanite 505.3 & 505.4	Mica	Cogebi		603/749-6896	/ /
525	ATL Winter Lubricants	Ethylene Glycol, non-haz 60%	Coilhose	Lubricant	201/752-5000	/ /
526	ATL Air Tool Lubricant	Petroleum Oil, paraff distil	Coilhose	Lubricant	201/752-5000	03/04/86
527	All T.C. Grades exc Solid T.C.	TungstenCarbide mixed w/cobalt	Cole	Metal Removal	313/536-9130	11/20/85
528	All Solid Titanium Carbide Gra	Titanium carbide mixed w/Co+Ni	Cole	Metal Removal	313/536-9130	11/20/85
529	Labelle SIL 2	Steel	Colt	Alloy	315/487-4111	11/18/85
530	EDM 244	Hydrocarbon, paraffinic	Commonwealth	Fluid, dielectric	519/738-3503	10/01/88
531	Conap S-8 Solvent	Toluene, PGMEA	Conap	Solvent	716/372-9650	05/30/89
532	Aluminum Alloys 2124-7175	N/A	Consolidated	Alloy	618/452-5190	08/14/84
533	Aluminum/Magnesium Casting	Chemical Mixture	Controlled Castings	Alloy (casting)	516/349-1717	11/25/85
534	Cool 5682	Oil, petroleum-based soluble	Cook's	Lubricant	201/862-2500	02/03/89
535	Cook Cut B-1	Lubricating Oil, petrol-based	Cook's	Lubricant	201/862-2500	07/12/90
536	Royco Hydraulic Fluid	Oil, petroleum-based	Cook's	Lubricant	201/862-2500	05/08/89
537	Zinc Iodide	N/A	Cooper Chem.		201/876-3231	10/28/86
538	GD-800	Mineral Oil, refined	Cooper Ind.	Coolant,compressor	217/222-5400	/ /

539	Aluminum Alloys	Aluminum	Copper and Brass Sales	Alloy	313/775-7710	02/01/89
540	Copper/Copper Alloys	N/A	Copper and Brass Sales	Alloy	313/775-7710	02/01/89
541	Micarta	N/A	Copper and Brass Sales		313/775-7710	02/01/89
542	Nickel Base Alloy	N/A	Copper and Brass Sales	Alloy	313/775-7710	02/01/89
543	Stainless Steel	N/A	Copper and Brass Sales	Alloy	313/775-7710	02/01/89
544	Steel Products	N/A	Copperweld	Alloy	216/841-6011	11/01/85
545	Hydrogen Nitrate	Nitric Acid	Corco	Acid	215/295-5006	10/01/85
546	Yttria Spray Powder	Zirconium Oxide	Corning	Coating	216/248-0500	05/15/80
547	Glass Code 7940	Fused Silica	Corning Incorporated		607-974-8002	08/01/90
548	Supreme Semi Lustre	Mineral Spirits	Coronado	Paint Product	904/428-6461	/ /
549	VCI-132 Pads/VCI-137 Foam roll	N/A	Cortec	Insulation	612/224-5643	04/14/88
550	First Aid Cream	Benzocaine,BenzylAlc,Phen,Alla	Corwood Labs	Medical	516/273-7373	11/24/87
551	Cotronics 900 Series Adhesives	Refractory Ceramic	Cotronics Corporation		718-646-7996	08/08/90
552	Cotronics 1529 Duraseal	Methylphenysiloxane Solution	Cotronics Corporation	Résin	718-646-7996	12/20/89
553	Cotronics Epoxy Hardeners	Mixture	Cotronics Corporation		718-646-7996	09/01/89
554	Cotronics 700 Series Castables	Refractory Ceramic	Cotronics Corporation		718-646-7996	10/31/90
555	Cotronics Ceramic Fiber	Aluminosilicate	Cotronics Corporation	Ceramic Fiber	718-646-7996	01/08/90
556	Cotronics Epoxy Resins	Modified Epoxy Resin	Cotronics Corporation	Epoxy Resin	718-646-7996	01/01/90
557	Brass	N/A	Covac	Alloy	203/757-9277	01/01/89
558	Rubberized Abrasive Finishers	Silicon Polymers w/ copol/neop	Cratex	Abrasive	707/746-1700	/ /
559	Javel Water Bleach,Soda Bleach	Sodium Hypochlorite	Crevit, H.	Bleach	203/772-3350	05/01/82
560	Chico A Sealing Compound	Calcium Aluminate Cem,calc.gyp	Crouse-Hinds	Insulation	315/477-7000	/ /
561	Chico X Sealing Fiber	Alumina-Silica Composition	Crouse-Hinds	Insulation	315/477-7000	/ /
562	7411 Bright Orange Enamel	MEK 27%,Xylene 13.7%	Custom-Pak	Paint Product	414/251-6180	05/14/87
563	Beige Design Line	Acetone 24.5%,Toluene 14.3%	Custom-Pak	Paint Product	414/251-6180	03/02/87
564	ANSI 61 Light Gray	Acetone 26%,Toluene 13.7%	Custom-Pak	Paint Product	414/251-6180	04/06/87
565	Blue Acrylic	Acetone 17%,Methylene Chlor15%	Custom-Pak	Paint Product	414/251-6180	12/01/87
566	Gray Hammertone	Acetone 33%,Xylene 14.2%	Custom-Pak	Paint Product	414/251-6180	03/02/87
567	Gray Epoxy	Acetone 31.2%	Custom-Pak	Paint Product	414/251-6180	06/23/87
568	Gray Primer	Acetone 29%,Toluene 12.3%	Custom-Pak	Paint Product	414/251-6180	03/02/87
569	Dark Brown Design Line	Acetone 17%,Methylene Chlor14%	Custom-Pak	Paint Product	414/251-6180	12/01/87
570	Green Epoxy	Acetone 30.5%,Xylene 14.2%	Custom-Pak	Paint Product	414/251-6180	10/01/87
571	High Solid Gray Primer	Acetone 26.9%,Toluene 12.3%	Custom-Pak	Paint Product	414/251-6180	03/02/87
572	Orange Enamel	Toluene 16%,Methylene Chlor15%	Custom-Pak	Paint Product	414/251-6180	04/21/86
573	Stain Gray Enamel	Acetone 29%,Xylene 12.6%	Custom-Pak	Paint Product	414/251-6180	06/23/87
574	White Enamel	Acetone 19%,Xylene 12.1%	Custom-Pak	Paint Product	414/251-6180	05/14/87
575	Specialty Steels: 10 MSDS	Steel, specialty	Cytemp Specialty Steel/Cyclops	Alloy	814/827-3641	09/16/85
576	Dacco Guard 2336	Oil Based Rust Preventative	D.A. Stuart Oil Co.	Rust Preventative	312-655-4595	/ /
577	DAP 33 Glazing	Glazing Compound	DAP Inc.		800-543-3840	05/17/88
578	Vitrified Bench Grinding Wheel	Alpha Alumina	Darex	Abrasive	503/488-2224	/ /
579	Vitrified Bench Grinding Wheel	Silicon Carbide	Darex	Abrasive	503/488-2224	/ /
580	VW 35L Creped	Diethylaminoethanol	Daubert	Coating	312/409-5100	05/24/89
581	Uniwrap 200	Diethylaminoethanol 8%	Daubert		708/409-5100	01/02/90
582	Grinding Wheel	Diamond/CBN	Dessau	Abrasive	212/759-3434	04/19/86
583	5-Minute Epoxy-Hardener	2,4,6-Tri(Dimethylaminometh) P	Devcon	Polymercaptan	617/777-1100	10/01/85

584	Devcon F	Aluminum Putty	Devcon	Adhesive	617/777-1100	09/01/75
585	Rust-Lick G-25-J	N/A	Devcon/Rust Lick	Lubricant	617/777-1100	10/17/85
586	Cutzol 711	Naphthenic Distillate 60-70%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
587	Cutzol EDM-30	Petrol/Paraf Distillate 40-60%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
588	Cutzol WS-500-A	Naphthenic Distillate 70-80%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
589	Cutzol WS-5050	Naphthenic Distillate 40-50%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
590	Cutzol PB-10	Naphthenic Distillate 40-50%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
591	Cutzol SCFO-504	Naphthenic Distillate 70-80%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
592	Cutzol WS-15	Naphthenic Distillate 17%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
593	Cutzol WS-11	Naphthenic Distillate 70-80%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
594	Cutzol WS-10	Naphthenic Distillate 60-70%	Devcon/Rust-Lick	Lubricant	617/777-1100	01/01/85
595	Kleenzol NPH	N/A	Devcon/Rust-Lick	Cleaner	617/777-1100	01/01/85
596	Kill-Cide 700	N/A	Devcon/Rust-Lick	Cleaner	617/777-1100	11/01/85
597	Kleenzol DY	Diethanolamine 5-10%	Devcon/Rust-Lick	Cleaner	617/777-1100	10/17/85
598	Rust-Lick 119-SO	Naphthenic Distillate 40-50%	Devcon/Rust-Lick	Lubricant	617/777-1100	11/01/85
599	Rust-Lick 123	Petroleum Solvent 40-50%	Devcon/Rust-Lick	Lubricant	617/777-1100	11/01/85
600	Rust-Lick 175-DS	Petroleum Solvent 60-75%	Devcon/Rust-Lick	Lubricant	617/777-1100	11/01/85
601	Rust-Lick 606	Petroleum Solvent 60-70%	Devcon/Rust-Lick	Lubricant	617/777-1100	11/01/85
602	Rust-Lick 631	Petroleum Naphtha 70%	Devcon/Rust-Lick	Lubricant	617/777-1100	03/09/87
603	Rust-Lick 660-JX	N/A	Devcon/Rust-Lick	Cleaner	617/777-1100	11/01/85
604	Rust-Lick B	N/A	Devcon/Rust-Lick	Corrosion Inhibitor	617/777-1100	11/01/85
605	Rust-Lick B-5J	N/A	Devcon/Rust-Lick	Corrosion Inhibitor	617/777-1100	11/01/85
606	Rust-Lick G-1066-D	N/A	Devcon/Rust-Lick	Lubricant	617/777-1100	10/17/85
607	Rust-Lick G-25-AH	N/A	Devcon/Rust-Lick	Lubricant	617/777-1100	10/17/85
608	Rust-Lick CV-11-E	Naphthenic Distillate 70-80%	Devcon/Rust-Lick	Lubricant	617/777-1100	11/01/85
609	Vytron-N	N/A	Devcon/Rust-Lick	Lubricant	617/777-1100	10/17/85
610	Tapzol	1,1,1-Trichlor 15-25%	Devcon/Rust-Lick	Lubricant	617/777-1100	/ /
611	Vytron Safety Coolant	N/A	Devcon/Rust-Lick	Coolant	617/777-1100	11/01/85
612	All High Speed Steel Cut Tools	Steel, high speed	Devlieg	Tool	313/280-1100	02/01/86
613	All Cemented Tungsten(Titan)C.	Tungsten Carbide	Devlieg	Metal Removal	313/280-1100	02/01/86
614	Ethanol	Ethyl Alcohol	Devon		609/443-6300	/ /
615	Ethyl Alcohol, 190 Proof	N/A	Devon	Solvent	609/443-6300	/ /
616	Proprietary Solvent 3-190	Ethyl Alcohol	Devon	Solvent	609/443-6300	/ /
617	Clor-D-Tect Q4000 Used Oil Qua	N/A	Dexsil	Oil Quantification K	203/288-3509	04/20/88
618	Clor-D-Tect 1000 Used Oil Scre	N/A	Dexsil	Oil Screening Kit	203/288-3509	08/16/88
619	M-310 HyComp Polyimide Molding	compound prepolymer/fillers	Dexter Corporation	Molding compound	216-234-2002	01/01/89
620	Nickel Plated Abrasive Product	Nickel	Di-Coat	Abrasive	313/349-1211	/ /
621	Diamond/CBN Grinding Wheel Bon	N/A	Diagrind	Abrasive	708/460-4333	09/01/89
622	Dacromet 200 Complete	Zinc	Diamond Shamrock	Alloy	214/922-2700	12/15/81
623	Chromic Acid-Flake	Chromic Acid	Diamond Shamrock	Acid	214/922-2700	06/09/86
624	Caustic Potash Standard Flake	Potassium Hydroxide	Diamond Shamrock		214/922-2700	05/13/86
625	Hot Dip Strippable Coating 1	Mineral Oil 65%	Dip Seal Plastics	Coating	815/398-3533	11/18/85
626	Lubricat Natural Graphite 635	Natural Graphite	Dixon Ticonderoga	Lubricant	201/244-7110	09/01/85
627	IN 100/600/625	Nickel Base Superalloy	Dover	Alloy	201/361-2310	02/19/86
628	Ni Resist	Iron-base alloy	Dover	Alloy	201/361-2310	02/19/86

629	Antifreeze, Ethyl Glycol Base	Ethylene Glycol	Dow Chem.	Antifreeze	517/636-4400	05/03/72
630	Dowfrost Heat Transfer Fluid	Propylene Glycol	Dow Chem.	Fluid	517/636-4400	02/19/90
631	Dowex HCR-S,20-50 Mesh,H Catio	Sulfon.Polymer-Styrene+Div.Ben	Dow Chem.	Cation Exchange Resi	517/636-4400	10/16/85
632	Glycerine, USP, 99.5%	Glycerine, minimum 99.5%	Dow Chem.		517/636-4400	10/16/85
633	Dursban L.O. Insecticide	2921-88-2 41.5,64742-95-6 58.5	Dow Chem.	Cleaner	517/636-4400	01/14/86
634	Chlorothene SM Solvent	1,1,1-Trichlor 96.5%	Dow Chem.	Cleaner	517/636-4400	01/20/90
635	Caustic Soda Solution 50%	Sodium Hydroxide	Dow Chem.	Cleaner, metal	517/636-4400	12/19/85
636	Papi 20,27,94,135,580,901	MDI	Dow Chem.	Polymeric Isocyanate	713/479-7666	03/03/86
637	Papi 135 Polymeric MDI	MDI	Dow Chem.	Polymer	517/636-4400	05/17/86
638	Voranol 270-370 Polyol	N/A	Dow Chem.	Polyol	517/636-4400	02/22/89
639	Voranol 490 Polyol	Polyether Polyol	Dow Chem.		517/636-4400	02/11/87
640	Voranol 370 Polyol	Polyether Polyol	Dow Chem.		517/636-4400	12/12/85
641	Voranol 240-490 Polyol	N/A	Dow Chem.	Polyol	517/636-4400	02/22/89
642	210H Fluid, 100 CS.	N/A	Dow Corning	Fluid	517/496-5900	02/24/88
643	704 Diffusion Pump Fluid	Silicone	Dow Corning	Fluid, pump	517/496-5900	10/20/87
644	Dow Corning 193 Surfactant	Polysiloxane	Dow Corning	Surfactant	517/496-5900	09/26/85
645	Dow Corning 111 Compound	Silicone	Dow Corning		517/496-5900	10/10/85
646	Dow Corning 200 Fluid, 50 CS	N/A	Dow Corning	Lubricant	517/496-5900	01/20/86
647	Dow Corning 710 Fluid	Silicone	Dow Corning	Fluid	517/496-5900	11/03/87
648	Dow Corning 200 Fluid, 2 CST	N/A	Dow Corning	Lubricant	517/496-5900	11/15/85
649	Molykote 106 Bonded Lubricant	Resin Solution	Dow Corning	Lubricant	517/496-5900	07/08/85
650	Molykote Metal Protector	Perchloroethylene 90%	Dow Corning	Coating	517/496-5900	07/31/87
651	Molykote 55M Grease	Grease	Dow Corning	Lubricant	517/496-5900	07/08/85
652	55 O-Ring Lubricant	Lubricant	Dow Corning Corporation	Lubricant	517-496-5900	07/14/89
653	Molykote Z Powder	Molybdenum Disulfide	Dow Corning Corporation	Powder	517-496-5900	09/07/85
654	330,331,3301,332,353,3532,360	Leaded Brass	Drawn	Alloy	716/879-6700	11/25/88
655	605,210,220,226,230,240,260...	Binary Brass	Drawn	Alloy	716/879-6700	11/25/88
656	443	Tin Brass	Drawn	Alloy	414/747-3524	11/25/88
657	110,1110,103,1103,1102,1105	Electrolytic Tough PitchCopper	Drawn	Alloy	716/879-6700	11/25/88
658	101,102,1021	Oxygen Free Copper	Drawn	Alloy	716/879-6700	11/25/88
659	UNS Alloy C-7525-18%	Nickel Silver 65-18%	Drawn	Alloy	716/879-6700	/ /
660	UNS Alloy C-706	Copper Nickel 10%	Drawn	Alloy	716/879-6700	/ /
661	UNS Alloy C-740	N/A	Drawn	Alloy	716/879-6700	/ /
662	Drewfloc 270 Flocculant	Acrylamide Polymer w/ Na Acryl	Drew	Insulation	201/263-7600	02/27/90
663	W&B Synlube E-55	Petroleum Oil	Dryden	Lubricant	301/574-5000	12/07/89
664	D-Smut	Chromic Acid	DuBois	Acid	513/554-4200	11/30/88
665	DuBois #422	Alkaline Power Washer Material	DuBois	Cleaner, alkaline	513/554-4200	07/05/83
666	Jettacin	N/A	DuBois	Cleaner	513/554-4200	06/21/90
667	Strypp Away	Potassium Cresylate,Pot.Hydrox	DuBois	Paint Stripper	513/769-4200	09/10/85
668	Sprex AC	Aluminum Safe Cleaner	DuBois	Cleaner	513/554-4200	10/14/85
669	30 Platin Gray PX Primer Surfa	Toluene	DuPont	Primer Surfacer	800/441-7515	02/05/90
670	Acetic Acid	Reagent	DuPont	Acid	302/774-2421	10/01/82
671	Black Lucite Acrylic Lacquer	Toluene	DuPont	Lacquer	800/441-7515	02/05/90
672	45828LH Brown	Toluene	DuPont	Paint Product	800/441-7515	02/05/90
673	5040L White	Toluene	DuPont	Paint Product	800/441-7515	02/05/90

674	78261L Green	Toluene	DuPont	Paint Product	800/441-7515	02/05/90
675	5027LH Monza Red	Toluene	DuPont	Paint Product	800/441-7515	02/05/90
676	Freon TF Solvent, Freon PCA	Trichlorotrifluoroethane	DuPont	Cleaner	302/774-1000	10/01/85
677	Freon TF- (550028-1)	Trichlorotrifluoroethane	DuPont	Cleaner	302/774-1000	/ /
678	Hydrochloric Acid	N/A	DuPont	Acid	302/774-2421	08/01/79
679	Methanol	Methanol	DuPont	Solvent	212/971-4000	02/09/82
680	Hydrogen Peroxide	N/A	DuPont	Oxide	302/774-2421	10/01/79
681	Sodium Cyanide	N/A	DuPont	Cyanide	212/971-4000	01/01/89
682	Sodium Cyanide	Sodium Cyanide	DuPont	Plating	800-441-9442	10/01/88
683	Nitric acid	Inorganic Acid	DuPont	Acid	800/441-9442	11/01/87
684	Nitric Acid Weak GR. 38/40/42	Nitric Acid	DuPont	Acid	800/441-9442	06/06/77
685	QIC II and QIC 2000	N/A	DuPont	Freon Product	302/774-1000	11/01/87
686	Sulfuric Acid	N/A	DuPont	Acid	302/774-2421	10/01/85
687	Jettacin	General Purpose Cleaner	Dubois Chemicals Inc.	Cleaner	513-554-4200	06/16/89
688	OK Solvent	Additive	Dubois Chemicals Inc.	Additive cleaner	513-554-4200	11/30/88
689	Protecto-Coat 1000 (Comp. A)	Resin Blend(epoxy),silica fill	Dudick		216/467-1970	/ /
690	Protecto-Coat 1000 (Comp. B)	Coal Tar	Dudick	Hydrocarbon	216/467-1970	/ /
691	Sodium Cyanide	Alkali Metal Cyanide	Dupont	Plating	800-441-9442	10/01/88
692	Fluorescein Green Concentrate	N/A	Dwyer		219/872-9141	05/18/87
693	Red Gage Oil	N/A	Dwyer	Lubricant	219/872-9141	05/12/87
694	Dykem Layout Fluids	Ethyl Alcohol,N-Butylacetate	Dykem	Fluid	314/423-0100	07/02/87
695	Dykem Remover & Thinner 138	Ethyl Alcohol, denatured	Dykem	Remover,thinner	314/423-0100	10/14/86
696	Dykem Steel Blue DX-100	Eth.Alc.(denat.),N-butyl aceta	Dykem	Coating	314/423-0100	10/14/86
697	Grade GC	Graphite 45%, Furfuryl Alc 25%	Dylon	Adhesive	216/234-1600	11/27/85
698	Dynasolve 170/170-15	Methanol60-80%,MethChlor20-40%	Dynaloy	Solvent	201/887-9270	09/01/89
699	Dynasolve 710/711/750	PGME 40-70%	Dynaloy	Cleaner	201/887-9270	09/01/89
700	Dynasolve 700	PGME 50-80%	Dynaloy	Solvent	201/887-9270	09/01/89
701	Dynaloy 190	Methanol 88-98%	Dynaloy	Solvent	201/887-9270	09/01/89
702	Uresolve 411	Methanol, Potassium Hydroxide	Dynaloy Inc.	Solvent	201-887-9270	09/01/89
703	Dynaflow Compounds	Naphthenic Oil, Hydrotreated	Dynetics	Lubricant	617/933-2680	/ /
704	Dynaflow Compounds	Mixture	Dynetics Corporation		617-933-2680	03/01/88
705	Cosmoline 1104	mixture- stoddard solvent	E.F. Houghton & Co.	Oil	215-666-4105	/ /
706	Gum Solvent	Mixture	E.F. Houghton & Co.	Solvent	215-666-4105	01/11/90
707	Cosmoline 1062	Petroleum Oil	E.F. Houghton and Co.	Metalworking Fluid	215-226-1535	03/07/88
708	Freon 12	Halogenated Hydrocarbon	E.I. Du Pont Co.	Refrigerant	302-774-2421	02/01/86
709	Freon 22	Halogenated Hydrocarbon	E.I. Du Pont Co.	Refrigerant	302-774-2421	02/01/86
710	1,4 Dioxane	Dioxane	E/M		317/497-6100	05/25/90
711	Lube-Lok 2006	Bonded solid film	E/M	Lubricant	317/497-6100	08/24/89
712	Lube-Lok 4396 Concentrate	Bonded Solid Film	E/M	Lubricant	317/497-6100	11/30/88
713	Perma-Slik G Aerosol	Solid Film Lubricant	E/M	Lubricant	317/497-6100	11/20/85
714	Lube Lok 4396 Concentrate	Complex Mixture	E/M Corporation	Film Lubricant	317-497-6100	11/30/88
715	Rust Veto 266	Combustible Liquid	EF Houghton Co.	Petroleum Oil	215-666-4105	02/07/86
716	Rust Veto 4214	Combustible Liquid	EF Houghton Co.	Petroleum Oil/Grease	215-666-4105	03/10/87
717	Wakefield A-4 Hardener	Aliphatic Amine blend	EG&G Wakefield Engineering		617-245-5900	11/01/88
718	Delta Cast 153 Blue	Epoxy Resin	EG&G Wakefield Engineering		617-245-5900	10/26/88

719	Wakefield C-4 Hardener	Modified Aromatic Amine	EG&G Wakefield Engineering		617-245-5900	10/26/88
720	Amicon Wakefield 84	Polyamine	EG&G Wakefield Engineering		617-245-5900	08/17/89
721	Wakefield 152 Blue	Epoxy Resin	EG&G Wakefield Engineering		617-245-5900	06/12/90
722	Teflon Fluorocarbon Resin	Resin	EI DuPont Co.	resin	800-441-3637	11/19/85
723	All Tungsten Carbide Grades	TungstenCarbide mixed w/cobalt	EJ	Metal Removal	615/563-5043	11/01/85
724	"Cellosolve";Ethyl Glycol Mono	2-ethoxyethanol	EM	Ether	609/354-9200	09/06/86
725	Sodium Chloride	N/A	EM	Inorganic Slat	609/354-9200	05/01/84
726	Silica Gel	Silica 99.6%	Eagle		205/452-9624	08/24/89
727	MarCon CDA836-933 E/P M37-66	Copper	Eagle-Picher	Alloy (bearing)	419/522-3323	06/01/85
728	Manganese Bronze/Alum Bronze	Copper	Eagle-Picher	Alloy (bearing)	419/522-3323	06/01/85
729	Kodak Coloredge Magenta Develo	Solid Mixture	Eastman Kodak Company	Developer	716-722-5151	03/05/90
730	Kodak Coloredge Cyan Developer	Solid Mixture	Eastman Kodak Company	Developer	716-722-5151	03/05/90
731	Yellow Developer	Solid Mixture	Eastman Kodak Company	Developer	716-722-5151	12/03/90
732	Ultragel II	N/A	Echo Ultrasound		717/667-3266	07/01/89
733	Tool and Carbon Steel	Steel	Eclipse Industrial Products	Steel	501-536-2233	10/01/89
734	Carbon, Alloy, and Tool Steels	Steel, carbon/tool	Economy Bushing	Alloy	414/643-1900	11/21/85
735	Aluminum Foundry Castings	Aluminum 70%	Electric Casting	Casting, finished	201/344-0333	/ /
736	Eccocoat 257	Nitrocellulose Lacquer	Emerson & Cuming	Coating	617/828-3300	07/24/74
737	Heli-Coil Inserts	Stainless Steel	Emhart Fastening Systems Group	Inserts	203-743-7651	/ /
738	Engaloy 255	Gold,nickel	Engelhard	Alloy	216/292-9200	10/01/87
739	Metal Cleaning Compound	Sodium Hydroxide	Engelhard	N/A	216/292-9200	03/30/89
740	Platinum Ink	Platinum	Engelhard	Ink	216/292-9200	11/14/85
741	Tumbling Compound	Borate Compound/Chemical Mix	Engelhard	Abrasive	216/292-9200	03/30/89
742	Kemtex 195DA	Chemical Mixture	Engelhard Corporation	Metal Cleaning	216-292-9200	05/04/89
743	Actane AAA	N/A	Enthone	Surfactant	203/934-8611	07/09/87
744	Enplate HT-1	Sulfuric Acid	Enthone	Acid	203/934-8611	03/30/89
745	Enplate NI-419C	Water	Enthone	Hypophosphite	203/934-8611	07/06/89
746	Enplate NI-419B	Water	Enthone	Ammonia	203/934-8611	07/06/89
747	Enstrip S	N/A	Enthone		203/934-8611	08/01/78
748	Enplate NI-418C	Sodium Hypophosphite	Enthone		203/934-8611	08/11/89
749	Enstrip A	Sodium Cyanide	Enthone		203/934-8611	10/02/89
750	Enplate AD-481	Ammonium Persulfate	Enthone	Oxidizer	203/934-8611	06/26/87
751	Enplate Activator 443	Water	Enthone	Tin, palladium	203/934-8611	01/19/89
752	Enplate Activator 444	Hydrochloric Acid	Enthone	Acid	203/934-8611	06/03/87
753	Enplate Stop-Off 1	Toluene	Enthone		203/934-8611	08/09/89
754	Enplate PA-491	Fluoboric Acid, Formic Acid	Enthone	Acid	203/934-8611	06/29/87
755	Enstrip TL Concentrate	N/A	Enthone	Stripper	203/934-8611	08/01/78
756	Enplate CU-404A	Formaldehyde, cupric nitrate	Enthone	Aldehyde	203/934-8611	07/06/89
757	Enplate PC-453	Sodium Hydroxide	Enthone	Cleaner, metal	203/934-8611	07/10/89
758	Enplate NI-418B	Water	Enthone	Thiourea	203/934-8611	07/06/89
759	Enplate NI-418A	Nickel Sulfate	Enthone		203/934-8611	07/06/89
760	Enplate CU-404C	Sodium Hydroxide	Enthone	Cleaner, metal	203/934-8611	01/01/79
761	Enplate CU-404B	Sodium Hydroxide, Methanol	Enthone	Cleaner, metal	203/934-8611	07/06/89
762	Enplate CU-404A	mixture	Enthone OMI Inc.	Plating	203-934-8611	10/24/90
763	Enstrip 110 Stabilizer	Mixture	Enthone OMI Inc.	Plating	203-934-8611	01/27/89

764	Enstrip 110A	Sulfamic Acid	Enthone OMI Inc.	Plating	203-934-8611	06/03/87
765	Enstrip 110B	Hydrogen Peroxide 50%	Enthone OMI Inc.	Plating	203-934-8611	06/10/87
766	Enstrip 110C	Mixture Water 90%	Enthone OMI Inc.	Plating	203-934-8611	02/09/89
767	Enplate PC-453	mixture-water caustic soda	Enthone-OMI Inc.	Plating	203-934-8611	10/23/90
768	Enplate Stop-Off #1	Toluene, Perchloroethylene	Enthone-OMI Inc.	Plating	203-934-8611	08/09/89
769	Heating Fuel 2	N/A	Environmental Health Center	Lubricant	415/233-3737	12/01/82
770	Cadabond 427		Epolux	Silicate	718/932-0620	/ /
771	Arc Shields (Ferrules)		Erico	Ceramic	609/235-6900	12/15/85
772	General Purpose Adhesive "77"	Modified Elastomer Solution	Erico	Polymer	609/235-6900	12/15/85
773	Industrial Laminates	Cured Melamine and Cellulose	Erico	Welding Accessories	609/235-6900	12/15/85
774	Phenolic & Cellulose Accessori	Phenolic, cellulose	Erico	Laminate,industrial	609/235-6900	12/15/85
775	Welding Accessories (Chucks)	Beryllium Copper	Erico	Alloy	609/235-6900	12/15/85
776	Weld Stud Aluminum Alloy	i,e, 6061-T6	Erico	Weld Stud	609/235-6900	12/15/85
777	Weld Studs Brass or Copper	Copper,zinc	Erico	Weld Stud	609/235-6900	12/15/85
778	Weld Studs Stainless Steel	Steel, stainless	Erico	Weld Stud	609/235-6900	12/15/85
779	Weld Studs Steel	Base Metal Iron	Erico	Weld Stud	609/235-6900	12/15/85
780	Welding Accessories	Epoxy Resin Glass Filled	Erico	Welding Access.	609/235-6900	12/15/85
781	B062-Eutecrod 1801	N/A	Eutectic	Brazing Rod	718/358-4000	09/18/86
782	AS90: Steeltectic N	Steel	Eutectic	Welding	718/358-4000	10/21/86
783	AQ 35: Staintrode D	N/A	Eutectic	Welding	718/358-4000	09/18/86
784	AK 75: Eutectrode 6800	N/A	Eutectic	Welding	718/358-4000	09/18/86
785	AC55: Xuper 22*33N	Steel, nickel	Eutectic	Welding	718/358-4000	09/04/87
786	Beautyweld	N/A	Eutectic	Arc Welding Electrod	718/358-4000	05/01/86
787	AS 05: Beautyweld	N/A	Eutectic	Welding	718/358-4000	09/18/86
788	AS 50: Eutectrode 680	N/A	Eutectic	Welding	718/358-4000	09/18/86
789	Eutecrod 1801	Silver,Copper,Zinc,Cadmium	Eutectic	Brazing Rod	718/358-4000	05/01/86
790	Eutector 1801 Flux	N/A	Eutectic	Flux	718/358-4000	05/01/86
791	DO 54: Eutector 1801 Flux	N/A	Eutectic	Flux	718/358-4000	09/18/86
792	Eutectrode 6800	N/A	Eutectic	Arc Welding Electrod	718/358-4000	05/01/86
793	Xuper 680 CGS	N/A	Eutectic	Arc Welding Electrod	718/358-4000	03/20/90
794	Xuper 22*33N	N/A	Eutectic	Arc Welding Electrod	718/358-4000	08/11/87
795	TQ 20: Tigtectic 66	Steel	Eutectic	Welding Rod	718/358-4000	09/18/86
796	Steeltectic N	N/A	Eutectic	Arc Welding Electrod	718/358-4000	10/16/86
797	TK25: Tigtectic 182	N/A	Eutectic	Welding	718/358-4000	09/18/86
798	Staintrode D	N/A	Eutectic	Arc Welding Electrod	718/358-4000	05/01/86
799	TG 10: Tigtectic 21	N/A	Eutectic	Welding	718/358-4000	09/18/86
800	Tigtectic 21	Aluminum, Silicon	Eutectic	GTAW Electrode	718/358-4000	05/01/86
801	Tigtectic 66	Iron, Manganese	Eutectic	GTAW Electrode	718/358-4000	05/01/86
802	Peel-Coat: Type I	N/A	Evans	Coating	313/583-9890	07/12/90
803	Peel-Coat Type I	Cellulose	Evans Manufacturing Inc.	Hot Dip Plastic Coat	313-583-9890	/ /
804	Abrasive Flow Media	N/A	Extrude Hone	Abrasive	412/863-5900	/ /
805	AC-20 Asphalt	Asphalt	Exxon		713/656-3424	04/10/86
806	627 Solvent (MineralSpirits135	Petroleum Hydrocarbons	Exxon	Solvent		09/06/85
807	Acetone	Ketone	Exxon	Cleaner	713/870-6000	05/23/85
808	Exxon Gasoline	Petroleum Hydrocarbons	Exxon	Gasoline	713/656-3424	04/10/86

809	Diesel 2	N/A	Exxon	Fuel	713/656-3424	07/10/86
810	Exxon Extra Unleaded Gasoline	Petroleum Hydrocarbons	Exxon	Gasoline, unleaded	713/656-3424	04/10/86
811	Mineral Spirits 135	Petroleum Solvent	Exxon	Solvent	713/656-3424	09/06/85
812	Isopar M	Petroleum Solvent	Exxon	Solvent	713/656-3424	/ /
813	Kutwell 82	Propietary Additives	Exxon	Lubricant	713/656-3424	04/10/86
814	Isopar L	Hydrocarbon Solvent	Exxon	Solvent	713/656-3424	05/18/82
815	Oakite Draw Clean M	Solvent-Soap Based Lubricant	Exxon	Lubricant	713/656-3424	06/01/89
816	Univolt 60	Petroleum Distillate	Exxon	Oil, insulating	713/656-3424	04/10/86
817	Varsol 2	Petroleum Naphtha,hydrotreated	Exxon	Solvent	713/656-3424	07/01/85
818	Turbo Fuel A	Petroleum Distllate,hydrotreat	Exxon	Fuel	713/656-3424	04/10/86
819	Univis J-13	Petroleum Hydrocarbon	Exxon	Oil, hydraulic	713/656-3424	04/16/79
820	Teresstic	Petroleum Lubericating Fluid	Exxon	Lubricant	713/656-3424	04/10/86
821	Turbo Oil 2380	Aviation Synthetic Lubricant	Exxon	Lubricant	713-656-3424	06/01/89
822	Varsol 3	Mineral Spirits	Exxon	Solvent	713/656-3424	07/29/85
823	Turbo Oil 2380	Base Lubr Pol Est+Prop Addit	Exxon	Lubricant	713/656-3424	06/01/89
824	Varsol 18	Mineral Spirits	Exxon	Solvent	713/656-3424	04/10/86
825	Varsol 1 AVCO-SPC3	Mineral Spirits	Exxon	Solvent, hydrocarbon	713/656-3424	04/10/86
826	Varsol 1	Stoddard Solvent	Exxon	Solvent	713/656-3424	12/04/86
827	Phosphoric Acid (70-85%)	N/A	FMC	Acid	215/299-6000	07/01/81
828	Falk Long Term Grease	Petroleum Oil	Falk	Lubricant	414/342-3131	04/01/89
829	All Tungsten Carbide Grades	TungstenCarbide mixed w/cobalt	Fansteel	Metal Removal	312/689-5000	05/01/89
830	Cast Cobalt Alloy	Cobalt	Fansteel	Alloy	312/689-5000	11/22/85
831	VR65 and W588	TungstenCarbide mixed w/nickel	Fansteel		312/689-5000	11/05/85
832	Cemented T.C. Mixed w/cobalt	Tungsten Carbide 62-97%	Fansteel VR/Wesson	Abrasive	203/628-4705	04/27/89
833	Aluminum/Magnesium Casting	N/A NOTE: THORIUM IS PRESENT	Fansteel/Wellman	Alloy	515/782-8521	12/28/88
834	5500 Rust Preventive/Lubricant	Petroleum Naphtha	Far West	Lubricant	818/768-3119	11/01/85
835	Dyno-Might Heavy Duty Degrease	N/A	Federal Int'l	Degreaser		/ /
836	Super Contreat	Hydrochloric Acid	Federal Int'l	Acid		01/06/87
837	Cemented T.C. Cutting Tools	Tungsten Carbide	Federal Mogul	Metal Removal	501/636-0539	04/30/86
838	Free All Deep Penetrating Oil	Methyl Isobutyl Ketone (MIK)	Federal Process	Oil, penetrating	216/464-6440	09/16/86
839	Clover Aluminum Oxide Grease	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
840	Clover Aluminum Oxide Pat-Gel	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
841	Clover Boron Carbide Grease	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
842	Clover Cryocut Grinding Aid	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
843	Clover Garnet Grease Mix	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
844	Clover Silicon Carbide Grease	Silicon Carbide, grease	Fel-Pro		312/761-4500	01/10/90
845	Clover Gramil Kool Grinding Ai	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
846	Clover Silicon Carbide Pat-Gel	N/A	Fel-Pro	Lubricant	312/674-7700	10/03/85
847	Tight	N/A	Fel-Pro	Dimethacrylate Monom	312/674-7700	10/18/85
848	Fel-Pro Nickel-Ease		Fel-Pro Incorporated		708-674-7700	08/11/89
849	All High Speed Steels/T.C.	Steels,tungsten carbides	Fellows	Metal Removal	802/886-8333	03/01/86
850	FBX Mineral Fiber Blanket	Mineral Fiber and Additives	Fibrex	Insulation	312/896-4800	/ /
851	Prestone A.F. antifre/coolant	Ethylene Glycol	First Brands	Antifreeze/Coolant		06/16/87
852	2-Propanol	N/A	Fisher		201/796-7100	06/11/86
853	Buffer Solutions pH 9.0-11.0	Water	Fisher	Acid	201/796-7100	05/04/89

854	Buffer Solutions	Water	Fisher	Acid	201/796-7100	05/04/89
855	Buffer Solutions pH 3,4,5	Water	Fisher	Acid	201/796-7100	05/04/89
856	Ammonium Chloride	N/A	Fisher		201/796-7100	05/19/80
857	Ethyl Ether	N/A	Fisher		201/796-7100	05/08/86
858	Mercury	Mercury, inorganic metal	Fisher	Metal	201/796-7100	03/25/86
859	Petroleum Ether	N/A	Fisher		201/796-7100	12/09/86
860	Stannous Chloride Dihydrate	N/A	Fisher		201/796-7100	02/09/88
861	Sulfuric Acid	N/A	Fisher	Acid	201/796-7100	06/27/83
862	Lubriplate Air Tool Lubricant	Petroleum Hydrocarbons	Fiske Bros.	Lubricant	201/589-9150	11/01/85
863	Lubriplate Mo-Lith No. 2	Lithium Soap, Mineral Oil	Fiske Bros.	Lubricant	201/589-9150	05/01/87
864	Lubriplate Lithium Series	Lithium Soap, Mineral Oil	Fiske Brothers Refining Co.	Grease	201-589-9150	06/01/89
865	Autostic-Rocksett-Adhaesium	Mg,Al,Na,Fe,Ca (SiO4)	Flexbar	Clay, inorganic	516/582-8440	/ /
866	Facsimile Powder	N/A	Flexbar		516/582-8440	/ /
867	Flexbar Release Agent	N/A	Flexbar	Cleaner	516/582-8440	/ /
868	Facsimile Liquid	N/A	Flexbar		516/582-8440	/ /
869	Reprorubber Putty	Vinyldimethylpolydimethylsilox	Flexbar	Adhesive	516/582-8440	/ /
870	Brass	Copper,zinc	Flexonics	Alloy	312/837-1811	11/25/85
871	Alloy Steel	N/A	Flexonics	Alloy	312/837-1811	11/25/85
872	Aluminum Alloys	1XXX-7XXX: Leaded 2011 & 6262	Flexonics	Alloys	312/837-1811	11/25/85
873	Bronze	Copper	Flexonics	Alloy	312/837-1811	11/25/85
874	Carbon Steel	N/A	Flexonics	Alloy	312/837-1811	11/25/85
875	Copper - CR & HR	N/A	Flexonics	Sheet	312/837-1811	11/25/85
876	Nickel Based Alloy Steel	Steel, nickel	Flexonics	Alloy	312/837-1811	11/25/85
877	Titanium	N/A	Flexonics	Alloy	312/837-1811	11/25/85
878	Stainless Steel	Steel, stainless	Flexonics	Alloy	312/837-1811	11/25/85
879	Tungsten Carbide	TitaniumCarbide w/ Ni/molybd.	Form-A-Tool	Insulation	216/961-0516	12/17/85
880	Franco Super...Heat+Air Settin	Fireclay Plastics	France	Insulation	814/387-6811	10/25/85
881	France Non Spall...Medal P4	Fireclay Brick	France	Insulation	814/387-6811	10/25/85
882	High Alumina Brick	Aluminum Oxide	France	Insulation	814/387-6811	10/25/85
883	Plastics. High Alumina	Aluminum Oxide	France	Plastic	814/387-6811	10/25/85
884	Titanium	N/A	Frankel	Alloy	313/366-5300	11/22/85
885	Gray Epoxy S.G. Touch-Up Ename	Xylol 43%	Frost	Paint Product	612/789-8871	08/08/85
886	GN-5	N/A	Fuji		312/569-3500	01/22/87
887	DN-5M	N/A	Fuji		312/569-3500	11/01/85
888	GR-D1	Hydroquinone<6.6%,Pot Hyd<4.6%	Fuji		312/569-3500	10/01/86
889	GR-F1	Acetic Acid 2.9%	Fuji		312/569-3500	01/22/87
890	SG Storage Gum	Water >70%, Gum arabic <15%	Fuji		312/569-3500	07/25/88
891	Fullsan (984)1,5,55 gallons	Sodium Carbonate	Fuller	Cleaner	316/792-1711	08/06/85
892	Cemented Carbide Product	Refractory Metal Carbide	Fullerton Tool Company	Grinding	517-799-4550	11/25/85
893	M-Pyrol	N-Methylpyrrolidone	GAF		201/628-3000	08/01/86
894	7526F	Blue Alkyd	GE	Adhesive	518/237-3330	11/21/85
895	AF60	Silica, hazardous colloidal	GE		518/237-3330	10/21/85
896	Antimony Metal/Powder	Antimony	GE		518/237-3330	10/22/80
897	BZN*tool blanks and inserts	TungstenCarbide mixed w/cobalt	GE	Tool	614/438-2205	11/12/85
898	G322L Silicone Grease	Zinc Chromate	GE	Lubricant	518/237-3330	10/21/85

899	Compax Die Blanks	Polycrystalline Diamond	GE	Abrasive	614/438-2205	11/12/85
900	G330M Polysiloxane Grease	Grease	GE	Lubricant	518/237-3330	10/21/85
901	G624	Dimethyl Siloxane w/silica	GE		518/237-3330	10/21/85
902	G661 Polysiloxane Grease	Grease	GE	Lubricant	518/237-3330	10/21/85
903	G627	Silicone	GE		518/237-3330	11/17/89
904	Lexan Resin	Bisphenol-A-Polycar	GE	Plastic	812/838-7236	02/20/90
905	RTV88 Silicone Rubber	Ethyl Silicate	GE		518/237-3330	03/23/88
906	SS4044: 2 MSDS, 1 in solvent	Acetone, isopropanol	GE	Primer	518/237-3330	10/21/85
907	SS4179	Ethyl Acetate	GE	Primer	518/237-3330	10/21/85
908	RTV102,103...IS808: 13 MSDS	Methyltriacetoxysilane	GE	Insulation	518/237-3330	10/21/85
909	RTV851B	Silicone	GE	Foaming Agent	518/237-3330	10/21/85
910	RTV851A	Polysiloxane, black	GE	Foam	518/237-3330	10/21/85
911	RTV 106	N/A	GE	Sealant, silicone	518/237-3330	03/05/90
912	RTV9950	????????	GE	Catalyst	518/237-3330	03/22/88
913	RTV-88	Ethyl Silicate	GE	Catalyst	518/237-3330	04/13/71
914	Molybdenum Metal	Refractory Metal	GTE	Alloy	717/265-2121	08/21/84
915	MILC 7024B Calibr Fluid	Petroleum Naphtha	Gage	Fluid, calibration	313/564-6530	07/29/01
916	Sealed Lead Battery closed cyl	Lead-Lead Oxides 69%	Gates		816/429-2165	03/01/90
917	Gatke 3853 or 3758	Asbestos Fiber, chrysotile	Gatke	Lining, brake	219/267-3171	11/25/85
918	Gatke 3610 Brake Lining	Asbestos Fiber	Gatke	Insulation	219/267-3171	11/25/85
919	Solid Carbide Cutting Tools	TungstenCarbide mixed w/cobalt	Gay-Lee	Metal Removal	313/435-5800	02/26/86
920	Silicon Carbide	N/A	General Abrasive		716/278-1234	/ /
921	Silicon Carbide Carbonite	Refractory Carbide	General Abrasive	Abrasive	716-286-1221	08/28/89
922	Chromic Acid	N/A	General Chem.	Acid	201/455-5630	09/01/86
923	Potassium Hydroxide, Pellets	N/A	General Chem.		201/455-5630	10/01/86
924	Sulfuric Acid	N/A	General Chem.	Acid	201/515-1840	10/01/87
925	Potassium Fluoride	Potassium Fluoride	General Chemical		201-455-3700	11/01/89
926	RTV 106	Silicopne Sealant	General Electric	sealant	518-237-3330	10/21/85
927	Grinding Wheel	Diamond/CBN Mtl/Vtrfd/Pltd	General I.D.	Abrasive	201/884-2500	11/21/85
928	Grinding Wheel	Diamond/CBN Resin Bonded	General I.D.	Abrasive	201/884-2500	11/21/85
929	Diamond/CBN Grinding Wheels	N/A	General Industrial Diamond	Abrasive	201/884-2500	11/21/85
930	Methanol	Methyl Alcohol	Georgia	Solvent	404/395-4585	08/06/86
931	Methanol	Aliphatic Alcohol	Georgia Gulf		504-685-2500	04/30/89
932	Gerin Neutral Solution	Isopropanol 50%	Gerin	Solvent	201/774-3256	02/11/87
933	Isopropanol	Oxygenated Hydrocarbon Mixture	Gerin		201/774-3256	02/11/87
934	Potassium Hydroxide Solution	N/A	Gerin		201/774-3256	04/14/87
935	All carbon grades, strip+ wire	Steel, carbon	Gibbs	Alloy	203/621-0121	05/30/86
936	Copper Base Strip or Wire	N/A	Gibbs	Alloy	203/621-0121	05/30/86
937	Stainless Steel	Steel, stainless	Gibbs	Alloy	203/621-0121	05/30/86
938	Liquid Paper Dust Remover	Dichlorodifluoromethane	Gillette Labs	Cleaner	301/424-2000	05/08/87
939	Liquid Paper Keyboard Cleaner	N/A	Gillette Labs	Cleaner	301/424-2000	06/11/87
940	Liquid Paper Anti-Static Spray	N/A	Gillette Labs	Cleaner	301/424-2000	05/20/87
941	Liquid Paper CRT Screen Cleane	N/A	Gillette Labs	Cleaner	301/424-2000	05/21/87
942	Acetone	Ketone	Glyptal	Cleaner	617/884-6918	11/01/85
943	Glyptal Red Insulating Enamel	MEK,acetone	Glyptal	Coating	617/884-6918	11/01/85

944	Glyptal Thinner 1500	Xylene,VM&P Naphtha	Glyptal		617/884-6918	11/01/85
945	Glyptal Adhesive Cement 1276	Ethyl Acetate,cellulose nitrat	Glyptal	Cement	617/884-6918	11/01/85
946	Glyptal Alkyd 1201B	Talc,xylene	Glyptal	Resin	617/884-6918	11/01/85
947	Glyptal Alkyd 1202	Xylene	Glyptal		617/884-6918	11/01/85
948	Glyptal	Hi-Temp Aluminum Silicone Enam	Glyptal	Enamel	617/884-6918	04/09/90
949	Glyptal Alkyd 1201	Xylene,talc	Glyptal	Resin	617/884-6918	11/01/85
950	Brake Lining (EBL164)	Phenol-Formaldehy Resin 20-25%	Goodyear	Brake Component	216/796-2121	04/01/85
951	923 & 858 Brazing Adaptors	Brass	Gordon	Insulation	815/678-2211	06/23/86
952	Beryllium Oxide Insulation	Beryllium Oxide	Gordon	Insulation	815/678-2211	06/23/86
953	Fibrous Glass/Felted Servtex I	Glass,fibrous	Gordon	Insulation	815/678-2211	06/23/86
954	Ceramic Fiber Insulation	Ceramic Fiber	Gordon	Insulation	815/678-2211	06/23/86
955	Magnesium/Aluminum Oxide Insul	Magnesium Oxide,Aluminum Oxide	Gordon	Insulation	815/678-2211	08/18/86
956	Metal Sheathed Cable	N/A	Gordon	Insualtion	815/678-2211	06/23/86
957	Kapton Insulation, Tefzel Ins	N/A	Gordon	Insulation	815/678-2211	06/23/86
958	PVC Insulation	N/A	Gordon	Insulation	815/678-2211	06/23/86
959	Vitreous Silica Insulation	Silica, amorphous	Gordon	Insulation	815/678-2211	06/23/86
960	Xactseal	Xylene	Gordon	Insulation	815/678-2211	06/23/86
961	699 Iodide Iodate	Iodide Iodate	Gotham		203/324-3230	/ /
962	Acid Starch Powder	Sulfamic Acid	Gotham	Acid	203/324-3230	/ /
963	602P Stannous Chloride Powder	N/A	Gotham	Reducer	203/324-3230	/ /
964	Aqua-Cide 100	Potassium N-Methyldithiocarbam	Gotham	Bactericide	203/324-3230	10/01/85
965	Alkaline Boil Out	N/A	Gotham		203/324-3230	08/02/85
966	706 Silver Nitrate	Silver Nitrate	Gotham		203/324-3230	/ /
967	Aqua-Cide 55	Poly...(CAS# 31075-24-8)	Gotham	Bactericide	203/324-3230	06/27/88
968	Formular P-67	N/A	Gotham		203/324-3230	08/02/85
969	Formular P	N/A	Gotham		203/324-3230	12/14/89
970	Formular 22 SS	1,1,1-Trichlor	Gotham	Adhesive	203/324-3230	12/14/89
971	Gothosperse	Isopropyl Alcohol <50%	Gotham		203/324-3230	12/14/89
972	Formular 170	Sodium Hydroxide	Gotham	Caustic	203/324-3230	08/02/85
973	Gothamine	Cyclohexylamine <25%	Gotham		203/324-3230	09/07/89
974	Formular 170L	N/A	Gotham		203/324-3230	05/16/89
975	Fuel-Rite	Aromatic Petrol Distillate<90%	Gotham	Lubricant	203/324-3230	09/07/89
976	Chromate Indicator	Potassium Chromate	Gotham	Inorganic Salt	203/324-3230	/ /
977	Molybdate Reagent	Sulfuric Acid,sodium molybdate	Gotham	Acid	203/324-3230	/ /
978	Oxy-Solve L	Sodium Sulfite <40%	Gotham	Solvent	203/324-3230	12/14/89
979	Phenol Red Code 2211	N/A	Gotham		203/324-3230	/ /
980	Poly Chor P-67	N/A	Gotham		203/324-3230	08/02/86
981	Sludge Gon	Sodium 2-mercaptobenzothiazole	Gotham		203/324-3230	12/14/89
982	Resin Cleaner	Organic Acid	Gotham	Cleaner	203/324-3230	11/29/89
983	Polycor BWI	N/A	Gotham	Alkaline	203/324-3230	/ /
984	Polycor BWT	Sodium Hyd<25%, Sodium Sul<20%	Gotham		203/324-3230	12/14/89
985	Phenolphthalein Indicator	Phenolphthalein(isop.alcohol)	Gotham		203/324-3230	/ /
986	Polytreet 300	Potassium Hydroxide 5.5%	Gotham	Cleaner	203/324-3230	12/14/89
987	Tower Cleaner A	N/A	Gotham	Cleaner	203/324-3230	12/14/89
988	Sulfuric Acid	N/A	Gotham	Acid	203/324-3230	/ /

989	Tower Cleaner B	N/A	Gotham	Cleaner	203/324-3230	02/09/90
990	Gothosperse	Isopropyl Alcohol (50%)	Gotham Technologies		203-324-3230	12/14/89
991	Electrostatic Toner Premix	Petroleum Hydrocarbon,Isoparaf	Graphic	Toner, electrostatic	716/853-7500	07/01/85
992	Clear Dispersant	Petroleum Hydrocarbon,Isoparaf	Graphic	Dispersant, clear	716/853-7500	07/01/85
993	Fast Dry Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
994	Code 30 Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
995	G.C. Corporate Thermal Cote	Polymer Compound	Graphic	Coating	716/853-7500	07/01/85
996	Fixative Spray/smoked charts	Toluol	Graphic	Coating	716/853-7500	11/01/85
997	Medium Dry Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
998	High Humidity Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
999	Slow Dry Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
1000	Plotter Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
1001	Water Removable Film Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
1002	Toner Concentrate	Petroleum Hydroc(iso),acetate	Graphic	Toner	716/853-7500	07/01/85
1003	Thermactive Ink	Polymer Compound	Graphic	Ink	716/853-7500	07/01/85
1004	Transfast Ink	Acid Dye	Graphic	Ink	716/853-7500	10/03/85
1005	300 Series Stainless Steels	Steel, stainless	Gray-Syracuse	Alloy	315/687-0014	/ /
1006	Hardenable Stainless Steels	Steel, stainless	Gray-Syracuse	Alloy	315/687-0014	/ /
1007	Nickel Base Superalloy	Steel, nickel	Gray-Syracuse	Alloy	315/687-0014	/ /
1008	Plain Carbon+Low Alloy Steels	Steel	Gray-Syracuse	Alloy	315/687-0014	/ /
1009	'Sairset	Cristobalite,quartz,NaSilicate	Green Refrac.	Insulation	314/473-3626	05/31/88
1010	G-26 Insulating Firebrick	Mullite, glass	Green Refrac.	Insulation	314/473-3626	04/21/83
1011	Empire DP High Duty Firec Bric	Mullite, glass	Green Refrac.	Insulation	314/473-3626	05/04/83
1012	Champion SM...S-1 SM	Refractory Bricks	Green Refrac.	Insulation	314/473-3626	03/03/88
1013	KS-4V...R-8002 Plus	Cristobalite,refractory cement	Green Refrac.	Insulation	314/473-3626	03/03/88
1014	Kast-O-Lite 25 & K-O-L 25 Plus	Refractory Cement	Green Refrac.	Insulation	314/473-3626	03/03/88
1015	Kast-Set & Kast-Set Plus	Refractory Cement	Green Refrac.	Insulation	314/473-3626	03/03/88
1016	Inswool Blankets & Bulks	Refractory Fiber	Green Refrac.	Insulation	314/473-3626	03/17/88
1017	Sairset	Refractory Mortar	Green Refrac.	Insulation	314/473-3626	06/25/86
1018	Alloy Steel: 9 MSDS	Steel	Green River	Alloy	502/926-4400	11/05/85
1019	Steel Bars	Steel, chrome	Green River	Alloy	502/926-4400	07/27/84
1020	High Speed Steel Cutting Tools	Iron Oxide 55.5-88.25%	Greenfield	Abrasive	404/863-7708	09/01/88
1021	High Speed Steel Cutting Tools	Ferrous Alloy	Greenfiled Industries	Cutting Tools	404-863-7708	09/01/88
1022	Gem1,Gem2,Gem9,LM55,LM56,GSN	Aluminum Oxide,zirconium oxide	Greenleaf	Ceramic	814/452-3232	10/01/85
1023	Cemented T.C. mixed w/cobalt	Tungsten Carbide 55-97%	Greenleaf	Abrasive	814/452-3232	10/01/85
1024	Greenleaf WG-300	Aluminum Oxide,silicon carbide	Greenleaf	Ceramic	814/452-3232	10/01/85
1025	Calibration Fluid MIL-C-7024C	Petroleum Hydrocarbons	Guard All	Fluid, calibration	203/838-5515	/ /
1026	Guhring,Inc.Twist Drills-Regri	Cobalt	Guhring	Twist drills-regrind	414/784-6730	/ /
1027	Twist Drills - Regrinding	Metal Alloy	Guhring	Drills	414-784-6730	/ /
1028	536-B1 Dry Compound	Sodium Cyanide	HM	Cyanide (plating)	313/875-5148	/ /
1029	536-B1 Liquid	Sodium Cyanide	HM	Cyanide (plating)	313/875-5148	/ /
1030	Buffer Solution Hardness 1	Aminomethylpropanol	Hach	Buffer Solution	515/232-2533	10/03/85
1031	CyaniVer 5 Cyanide Reagent	Potassium & Sodium Phosphate	Hach		515/232-2533	12/12/85
1032	Cyaniver 3 Cyanide Reagent	Potassium & Sodium Phosphate	Hach		515/232-2533	11/25/85
1033	ChromaVer 3	Potassium Pyrosulfate	Hach		515/232-2533	04/18/86

1034	Free Copper Reag Powd Pillows	Monohyd.Potas.,Sodi.Tartrate	Hach	Reagent powder pillo	515/232-2533	10/08/85
1035	FerroVer Iron Reagent 854	Sodium Hydrogen Sulfite	Hach	Reagent, iron	515/232-2533	04/17/86
1036	Chromium 2 Reagent	Sulfosalicylic Acid, dehydrate	Hach		515/232-2533	04/12/84
1037	EDTA Reagent	Ethylenediaminetetraacetic Aci	Hach	Acid	515/232-2533	09/06/85
1038	FerroVer Iron Reagent 927	Sodium Hydrogen Sulfite	Hach	Reagent, iron	515/232-2533	04/15/86
1039	Chromium 1 Reagent	Lithium Hydroxide	Hach		515/232-2533	02/28/86
1040	CyaniVer 4 Cyanide Reagent	Sodium Sulfate, anhydrous	Hach		515/232-2533	08/15/85
1041	Iron Phenanthroline	Alcohol	Hach		515/232-2533	11/22/85
1042	Handi Softener	Resin, cation	Hach	Softener	515/232-2533	11/05/85
1043	ManVer Hardness Indicator	Propylene Glycol	Hach	Hardness Indicator	515/232-2533	01/07/86
1044	Indicator Solution .3%	Dimethyl Formamide	Hach	Indicator	515-232-2533	09/13/85
1045	Precipitation C Solution	Potassium Hydroxide	Hach		515/232-2533	04/12/84
1046	Precipitation D Solution	8-Hydroxyquinoline,sulfuric ac	Hach	Acid	515/232-2533	10/23/85
1047	Soap Solution for Hardness Dem	Propylene Glycol	Hach	Hardness Demonstrati	515/232-2533	10/23/85
1048	Phthalate-Phosphate Reagent	Potassium Acid Phthalate	Hach	Acid	515/232-2533	09/16/85
1049	Titrant Solution Hardness 3	Propylene Glycol	Hach		515/232-2533	12/26/85
1050	Wide Range pH Indicator Ampule	Methyl Alcohol	Hach	Indicator	515/232-2533	04/12/84
1051	Wide Range 4 pH Indicator Soln	Isopropanol	Hach	Indicator	515/232-2533	04/12/84
1052	Rubber Bonded Grd Whl/Drs Stk	N/A	Hall	Abrasive	609/784-6700	/ /
1053	Halocarbon 27 Oil	N/A	Halocarbon Products	Lubricant	201/343-8867	/ /
1054	Halocarbon 4.2 Oil	N/A	Halocarbon Products	Lubricant	201/343-8867	/ /
1055	Anhydrous Ammonia	N/A	Hamler	Cleaner	708/757-5320	04/14/89
1056	Anhydrous Ammonia UN1005	N/A	Hamler	Gas	312/757-5320	/ /
1057	Anhydrous Ammonia	Ammonia	Hamler Industries Inc.	Liquid/Gas Ammonia	708-757-5320	04/14/89
1058	EasyFlo3 AWS Spec. A5.8 BAg-3	Silver 50%	Handy & Harman	Brazing Filler	212/752-3400	11/15/84
1059	Trimet 258	Ag 50%,Cu 15.5%,Zn 15.5%,Cd 16	Handy & Harman	Alloy	212/752-3400	11/15/84
1060	Handy Flux	Potassium Salts Fluorine Boron	Handy & Harmen	Sliver Brazing Flux	212-207-2632	01/16/89
1061	Handy Flux	Potassium salt Fluorine Boron	Handy and Harmon	Brazing Flux	212-752-3400	/ /
1062	Ct-11	Synthetic Lubricant	Hangsterfer's Laboratories	Lubricant	609/468-0216	11/01/88
1063	Steel Bodies in Cutting Tool	Alloys	Hannibal Carbide Tool	Cutting Tool	314-221-2775	12/01/88
1064	High Speed/Cem T.C. Cut Tools	N/A	Hanson-Whitney	Abrasive	203/249-9381	/ /
1065	4043 Aluminum	Aluminum	Harris	Alloy (silicon)	513/891-2000	02/14/85
1066	Kemtex 195DA	Sodium Hydroxide	Harshaw		216/292-9200	10/02/87
1067	Nickel chloride Spec 101	Nickel Chloride	Harshaw		216/292-9200	04/19/72
1068	Copper Sulfate Solution	Copper Sulfate Pentahydrate	Harstan	Inorganic Salt	212/435-8225	/ /
1069	Strong Arm Clean Degreas 1513	2-Butoxyethanol	Hartford	Cleaner	203/549-3131	12/30/85
1070	Finished Profile...CPVC Thermo	N/A	Harvel Plastics		215/252-7355	11/01/84
1071	Corrosion Resistant Alloys	Hastelloy B2......FM-259	Haynes	Alloy	317/456-6625	02/01/89
1072	Heat-Resistant Alloys	Haynes 263...Haynes HR-160	Haynes	Alloy	317/456-6625	02/01/89
1073	Titanium+Titanium Alloys	N/A	Haynes	Alloy	317/456-6625	02/01/89
1074	Welding Consumables	N/A	Haynes	Alloy	317/456-6625	05/01/89
1075	Melt-Blown Polypropylene Sorbe	N/A	Haztek	Sorbent	203/753-7099	07/06/90
1076	TA100 Tubular Absorbent	Natural Corncob Fractions	Haztek	Absorbent	203/753-7099	07/06/90
1077	Inserts:Free Running/Screw Loc	Staniless Steel	HeliCoil/Emhart	Alloy	203/743-7651	/ /
1078	Cemented T.C. mixed w/ cobalt	Tungsten Carbide 56-97%	Hertel	Abrasive	615/481-6000	10/13/87

1079	Cemented TitanCarb w/Ni & Mo	Titanium Carbide 30-90%	Hertel	Abrasive	615/481-6000	10/13/87
1080	Aluminum Core Honeycomb	Aluminum	Hexcel	Panel,aluminum core	800/433-5072	01/28/86
1081	HRH BLO,Amsterdam II,Tapered C	N/A	Hexcel	Phenolic Resin	800/433-5072	01/15/86
1082	HRH-10,310,78	Fiberglass	Hexcel	Phenolic Resin	800/433-5072	01/15/85
1083	HRH-327	Fiberglass	Hexcel	Polyamide Resin	800/433-5072	01/15/86
1084	HRH-49	Fiberglass	Hexcel	Resin, epoxy	800/433-5072	01/15/86
1085	HFT NP HRP	Fiberglass	Hexcel	Panel,phenolic resin	800/433-5072	01/15/86
1086	Hexgard 540 type 1 2	Metallic Honeycomb panel	Hexcel	Panel	800/433-5072	05/13/86
1087	Hexgard I-D	Fiberglass, graphite	Hexcel	Nonmet.honeycomb pan	800/433-5072	05/13/86
1088	Hexgard Panel- Type 1,2 & D	Fiberglass	Hexcel	Phenolic Resin	800/433-5072	01/21/86
1089	Hexcelite Type 4	Laminate composite panels	Hexcel	Laminated panels	800/433-5072	05/13/86
1090	WR-II	Fiberglass	Hexcel	Phenolic Resin	800/433-5072	01/15/86
1091	Metal/M.Alloys: Al,Cu,Pb,Steel	N/A	Hillman	Alloy	215/659-6010	11/25/85
1092	CB 120 Filler Foam	Trichlorofluoromethane	Hilti	Polyurethane	918/252-6000	05/23/89
1093	CB 120-R1	Acetone	Hilti	Cleaner for CB120 ff	918/252-6000	02/28/89
1094	Safety Boosters	N/A	Hilti	Power Loads	918/252-6000	06/27/88
1095	Aluminum Castings-800 Series	SC-000-058 REV:0	Hitchcock	Alloy (casting)	612/887-7800	11/19/85
1096	Aluminum Cast-Ser 300(no bery)	SC-000-052 REV:0	Hitchcock	Alloy (casting)	612/756-5111	11/20/85
1097	Aluminum Castings-200 Series	SC-000-047 REV:1	Hitchcock	Alloy (casting)	612/887-7800	11/20/85
1098	Aluminum Cast-300 Ser(w/ bery)	SC-000-048 REV:1	Hitchcock	Alloy (casting)	612/887-7800	11/20/85
1099	Aluminum Castings-203-2	SC-000-051 REV:0	Hitchcock	Alloy (casting)	612/887-7800	11/19/85
1100	Aluminum Castings-100 Series	SC-000-050 REV:0	Hitchcock	Alloy (casting)	612/887-7800	11/11/85
1101	Aluminum Castings-700 Series	SC-000-057 REV:0	Hitchcock	Alloy (casting)	612/887-7800	11/20/85
1102	Aluminum Castings-500 Series	SC-000-056 REV:1	Hitchcock	Alloy (castings)	612/887-7800	11/20/85
1103	Aluminum Castings-400 Series	SC-000-055 REV:0	Hitchcock	Alloy (casting)	612/887-7800	11/20/85
1104	Copper-Silicon Alloys	SC-000-023 REV:1	Hitchcock	Alloy	612/887-7800	10/31/85
1105	Magnesium/Thorium Alloy Castin	Magnesium,thorium	Hitchcock	Alloy	612/887-7800	11/25/85
1106	Magnesium Alloy Castings	Magnesium	Hitchcock	Alloy (casting)	612/887-7800	11/20/85
1107	Leaded Red Brasses	SC-000-020 REV:0 or 1?	Hitchcock	Alloy	612/887-7800	10/18/85
1108	Red Brasses (low lead)	SC-000-018 REV:0	Hitchcock	Alloy	612/887-7800	10/31/85
1109	Yellow Brasses	SC-000-021 REV:1	Hitchcock	Alloy	612/887-7800	10/31/85
1110	Carbon+Alloy Cast Steels	SC-000-009 REV:1	Hitchiner	Alloy	603/673-1100	11/22/85
1111	Austenitic Ductile Irons	Iron	Hitchiner	Alloy	603/673-1100	11/20/85
1112	Chromium Alloyed Steel Casting	SC-000-019 REV:1	Hitchiner	Alloy	603/673-1100	11/22/85
1113	Chromium/Nickel Alloyed	SC-000-015 REV:1	Hitchiner	Alloy	603/673-1100	10/11/85
1114	Chromium Based Steel Castings	SC-000-029 REV:1	Hitchiner	Alloy	603/673-1100	11/22/85
1115	High Alloyed Cast Steels	SC-000-002 REV:2	Hitchiner	Alloy	603/673-1100	12/17/85
1116	High Cobalt Steel Castings	SC-000-049 REV:1	Hitchiner	Alloy	603/673-1100	11/22/85
1117	Nickel Based Cast Steels	SC-000-008 REV:2	Hitchiner	Alloy	603/673-1100	11/22/85
1118	Nickel Alloyed	SC-000-016 REV:1	Hitchiner	Alloy	603/673-1100	11/22/85
1119	Nickel Based Foundry Products	Nickel	Hitchiner	Alloy	603/673-1100	11/22/85
1120	Tool Steels	Steel, tool	Hitchiner	Alloy	603/673-1100	11/01/85
1121	Abrasion Resistant Cast Iron	Iron	Hitchiner Manufacturing	Alloy	603/673-1100	11/20/85
1122	Irish Refrasil	Silica	Hitco	Insulation	513/425-5864	06/01/81
1123	Gas Metal Arc Welding Stainles	Steel	Hobart	Alloy	513/332-4000	06/01/88

1124	GasMetal(2)/FluxCored(1) A.W.	Groups A-C	Hobart	Alloy	513/332-4000	04/01/88
1125	Flux Cored Arc Welding	Groups A-D	Hobart	Alloy	513/332-4000	04/01/90
1126	Gas Metal Arc Welding Solid Wi	Steel	Hobart	Alloy	513/332-4000	/ /
1127	Electrodes-Stainless Steel,Low	Groups A-B	Hobart	Alloy	513/332-4000	03/01/88
1128	Mild Steel Electrodes	Steel	Hobart	Alloy	513/332-4000	05/01/90
1129	Rutile Coated (Titania)SSElect	Groups A-C	Hobart	Alloy	513/332-4000	10/01/89
1130	Shielded Metal Arc Welding	Groups A-C	Hobart	Alloy	513/332-4000	03/01/90
1131	Smootharc(5)/Soudostel(1)	Groups A-F	Hobart	Alloy	513/332-4000	10/01/89
1132	Nickel Base Electrodes	N/A	Hobart	Alloy	513/332-4000	09/01/89
1133	Submerged Arc Flux	Groups A-C	Hobart	Alloy	513/332-4000	04/01/90
1134	Ethylene Glycol	N/A	Hoechst Celanese		214/689-4000	01/31/90
1135	A-HCI-5E,A-HCI-10E	N/A	Hoffman	Corrosion Inhibitor	612/422-2755	06/01/87
1136	A-HCI-1DV,A-HCI-60R,A-HCI-240R	N/A	Hoffman	Corrosion Inhibitor	612/422-2755	06/01/87
1137	Brass	Copper,zinc	Holbrook	Alloy	617/853-4500	11/25/85
1138	Carbon steel	Steel, carbon	Holbrook	Alloy	617/853-4500	11/25/85
1139	Bronze	Copper	Holbrook	Alloy	617/853-4500	11/25/85
1140	Aluminum Alloys	1XXX-7XXX: Leaded 2011 & 6262	Holbrook	Alloys	312/455-7111	11/25/85
1141	Alloy Steel	Steel	Holbrook	Alloy	617/853-4500	11/25/85
1142	Copper - CR & HR	N/A	Holbrook	Sheet	617/853-4500	11/25/85
1143	Nickel Based Alloy Steel	Steel, nickel	Holbrook	Alloy	617/853-4500	11/25/85
1144	Stainless Steel	Steel, stainless	Holbrook	Alloy	617/853-4500	11/25/85
1145	Titanium	N/A	Holbrook	Alloy	617/853-4500	11/25/85
1146	Commercial Liquid Alum Sulfate	Aluminum Sulfate	Holland	Salt	413/743-1292	04/01/90
1147	LPS Tap-All	Water	Holt Lloyd		404/934-7800	01/03/85
1148	LPS 1 Greaseless Lubricant	Aliphatic Hydrocarbon	Holt Lloyd	Lubricant,greaseless	404/934-7800	09/20/85
1149	Nickel Based Alloy Billets	Nickel	Homogeneous	Alloy	315/839-5421	11/25/85
1150	Image Intensifier	Ammonium Thiocyanate	Horizons		216/475-0555	10/23/89
1151	Odis Sealing Additive	Nickel Acetate Tetrahydrate	Horizons	Adhesive	216/475-0555	03/29/89
1152	Zip Fixer or Tray Fixer	Water 39%	Horizons	Fixer	216/475-0555	10/23/89
1153	Zip Developer	Water 78%	Horizons	Developer	216/475-0555	10/23/89
1154	Cosmoline 1104	Stoddard Solvent	Houghton	Rust Preventative	215/666-4105	08/04/89
1155	Cosmoline 1095	Petroleum Oil	Houghton	Lubricant	215/666-4105	07/19/85
1156	Hydraulic Fluid 872-24	Mineral Oil	Houghton	Fluid, hydraulic	215/666-4105	01/03/86
1157	Quicklight A	Coke,charcoal,barium carbonate	Houghton	Hardener	215/666-4105	01/26/87
1158	Rust Veto 377	Stoddard Solvent	Houghton	Rust Preventative	215/666-4105	02/06/89
1159	694	Cobalt	Howmet	Alloy	201/361-2310	02/19/86
1160	300 Series Stainless Steels	Steel, stainless	Howmet	Alloy	201/361-2310	02/19/86
1161	400 Series Stainless Steels	Steel, stainless	Howmet	Alloy	201/361-2310	02/19/86
1162	BC-22/23 Diffusion Coating	Platinum,aluminum	Howmet	Coating	616/894-5686	06/16/86
1163	ECY768	Cobalt	Howmet	Alloy	201/361-2310	02/19/86
1164	FXS414...WI52	Cobalt	Howmet	Alloy	201/361-2310	02/19/86
1165	MDC-42	N/A	Howmet	Coating, aluminide	616/894-5686	06/16/86
1166	MDC-9 Diffusion Aluminide Coat	Aluminum,cobalt	Howmet	Alloy	616/894-5686	06/16/86
1167	IN 100,600,625: Nickel Alloys	N/A	Howmet	Alloy	313/455-2200	12/22/89
1168	How 1A, MP35N	Cobalt	Howmet	Alloy	201/361-2310	02/19/86

1169	How 6	Cobalt	Howmet	Alloy	201/361-2310	02/19/86
1170	How 1,3,6,12,25,36,F,J;98M2	Cobalt	Howmet	Alloy	201/361-2310	02/19/86
1171	LDC-2E Diffusion Coating	Platinum,aluminum	Howmet	Coating	616/894-5686	01/30/86
1172	IN 713	Nickel Alloy	Howmet Corp.	Nickel Alloy blades	201-361-2310	12/22/89
1173	Lusterlume 1	Soap, liquid-Surfactant	Hubbard-Hall	Cleaner	203/756-5521	08/12/80
1174	Lusterbrite AP	Surfactant/Mild Acid/Alcohol	Hubbard-Hall		203/756-5521	12/23/85
1175	Lusterclean 35	Isopropyl Alcohol	Hubbard-Hall	Cleaner	203/756-5521	06/04/86
1176	Aosyn Jet II Synth Turbine Oil	N/A	Huls	Lubricant	201/763-7173	03/23/90
1177	Aosyn Oil Mil-C-8188C	Aliphatic Diester Oil	Huls America Inc.	Metalworking Fluid	201-763-7173	02/27/90
1178	Hurri-Safe Hot Immersi Degreas	2-Butoxyethanol	Hurri-Kleen	Degreaser	205/655-8808	01/01/86
1179	Frekote 1 Dry Lubr (Aerosol)	Trichloromonofluoromethane	Hysol	Lubricant, dry	603/474-5541	06/11/87
1180	KS4007 Part A	Silver	Hysol	Resin, epoxy	818/968-6511	07/25/86
1181	KS4007 Part B	Silver	Hysol	Amine Hardener	415/687-4201	07/25/86
1182	EA 9394 Part B	Alkylamines <85%	Hysol/Dexter	Adhesive	415/687-4201	06/24/88
1183	EA 9394 Part A	Aluminum Powder <40%	Hysol/Dexter	Adhesive	415/687-4201	06/24/88
1184	Arklone P	1,1,2, Trichloro 1,2,2 trifluo	ICA Americas Inc.	Solvent	302-886-3000	09/24/89
1185	Talon-G Rodenticide Bait Pack	N/A	ICI	Cleaner	302/575-3000	07/01/85
1186	WeatherBlok Bait	N/A	ICI	Cleaner	302/575-3000	11/01/85
1187	Victrex Pek 220CA30	Victrex Pek 66-76%	ICI Advanced Materials		215/363-4500	07/17/90
1188	Victrex Peek PDX-88447	Victrex Peek 56-66%	ICI Advanced Materials		215/363-4500	07/17/90
1189	Arklone P	1,1,2-Trichl-1,2,2-Trifl 99.9%	ICI Americas		302/575-3000	10/02/87
1190	Copper Cyanide	N/A	ICI Americas	Electroplating	302/575-3000	10/01/85
1191	Saffil Alumina	Aluminum Oxide	ICI Americas	Insulation	302/575-3000	03/16/78
1192	Sodium Bicarbonate	N/A	ICI Americas		302/575-3000	11/01/85
1193	Specialty Steel	Steel, specialty/stainless	IRI	Alloy	806/665-3701	11/01/85
1194	5-Minute Epoxy Resin	Epoxy Resin	ITW Devco Corporation	Epoxy	508-777-1100	01/07/88
1195	Putty Hardener 200	Polyamines	ITW Devcon Corporation	Putty Hardener	800-424-9300	09/10/90
1196	Aluminum Putty Resin	Metal-filled epoxy resin	ITW Devcon Corporation	epoxy resin	800-424-9300	12/12/89
1197	Yellow 77	Mineral Oil, Paraffin Wax	Ideal	Lubricant	815/895-5181	12/06/85
1198	Wire Lube	Mica, sodium nitrite	Ideal	Lubricant, wire	815/895-5181	12/06/85
1199	Impco Liquid Detergent 356	Alkylate, linear	Impco	Cleaner	401/521-2490	/ /
1200	RC-2/140 Viscosity Regulator R	Styrene Co-reac.,Malea.Phth.Po	Impco	Resin, polyester	401/521-2490	/ /
1201	Clevite R-60 and R-64 Powders	Copper	Imperial Clevite	Alloy	216/481-7221	03/25/86
1202	Brightray, Ferry	N/A	Inco	Alloy	304/526-5436	05/01/85
1203	Incoloy alloys 800..DS	N/A	Inco	Alloy	304/526-5436	05/01/85
1204	Monel Alloys	Mixture	Inco	Alloy	304/526-5436	05/01/85
1205	Inco alloys HX..317LM	N/A	Inco	Alloy	304/526-5436	05/01/85
1206	Iconel alloys 600..MA6000	N/A	Inco	Alloy	304/526-5436	05/01/85
1207	Nickel Alloys	Nickel	Inco	Alloy	304/526-5436	05/01/85
1208	Nimoloy PK37/Nimocast 80..PK24	N/A	Inco	Alloy	304/526-5436	05/01/85
1209	Nimonic alloys AP1..PK33	N/A	Inco	Alloy	304/526-5436	05/01/85
1210	Inconel Alloys	Numerous Alloy ingredients	Inco Alloys International	Alloy metal	304-526-5100	08/01/89
1211	Masonry Cement	N/A	Independent Cement	Adhesive	518/459-3211	11/01/86
1212	Brake Lining LKV-105,-106,-108	Phenolic Resin	Industrial Clutch	Brake Component	414/547-3357	/ /
1213	Silver Seal	Asbestos Fibers	Industrial Gask.	Insulation	412/222-5400	/ /

1214	Silver Seal II	N/A	Industrial Gasket & Shim		412/222-5800	08/16/89
1215	Wilcut, proprietary solvent 3	Ethyl Alcohol	Industrial Petrochem.	Solvent	201/589-1450	01/01/87
1216	Intech 52 Dry Acid Descaler	SulfamicAcid90%(Sioux D.C.Con)	Industro Tech	Acid Descaler	312/949-8030	07/06/87
1217	All Cemented Carbide Grades	TungstenCarbide mixed w/cobalt	Ingersoll	Metal Removal	815/987-6607	05/22/86
1218	Steel	N/A	Inland Steel	Alloy	219/392-3892	10/04/85
1219	HE-175, Inland 19	Hydrocarbon Mineral Oil	Inland Vacuum	Lubricant	716/293-3330	/ /
1220	HE-200, Invoil 20 1	Alkanes	Inland Vacuum		716/293-3330	/ /
1221	IM-1000 Instant Metal Coat	Naphtha, VM&P	Insl-X	Coating	914/969-8000	05/10/90
1222	TT-E-485F	N/A	Insl-X	Enamel, Semi-Gloss	914/969-8000	01/01/88
1223	Vie-3	Ethyl Alcohol	International Appl.	Solvent	305/557-5850	03/29/88
1224	Vie-2 (Pyrothane)	MEK	International Appl.		305/557-5850	02/18/88
1225	Vie-4BP	Methyl Alcohol	International Appl.	Solvent	305/557-5850	03/01/88
1226	ICO-Sealer	N/A	International Coat.	Insulation	312/824-6088	/ /
1227	ICO-Super Guard Coating	N/A	International Coat.	Insulation	312/824-6088	/ /
1228	ICO-Primer	N/A	International Coat.	Primer	312/824-6088	/ /
1229	ICO-HiGuard Coating	N/A	International Coat.	Insulation	312/824-6088	/ /
1230	ICO-HiGuard	N/A	International Coat.	Insulation	312/824-6088	/ /
1231	ICO-SuperGuard	N/A	International Coat.	Insulation	312/824-6088	/ /
1232	ICO-Guard Coating	N/A	International Coat.	Insulation	312/824-6088	/ /
1233	ICO-Guard 51	N/A	International Coat.	Insulation	312/824-6088	/ /
1234	ICO-Guard 71	N/A	International Coat.	Insulation	312/824-6088	/ /
1235	INCO Nickel Pellets	Nickel Pellets	International Nickel		201/843-8600	09/13/85
1236	D-109 Decontaminant	Isopropanol, ammonia	International Pack.	Decontaminant	203/847-5292	/ /
1237	IPS TR 250 (Component A)	MDI-based Curing Agent	International Pack.	Curing Agent	203/838-4728	07/14/80
1238	IPS TR 250 Comp A,240,FR-TR257	MDI	International Pack.		203/847-5292	/ /
1239	IPS TR 250 (Component B)	Polyurethane Resin (polyol)	International Pack.		203/838-4728	07/14/80
1240	IPS TR 250 Comp B,240,257,257S	Fluorocarbon 11B	International Pack.	Resin, urethane	203/847-5292	/ /
1241	IPS F245 Comp A,F 245S...TR213	MDI	International Pack.		203/847-5292	/ /
1242	IPS(F 245) F 245S Comp B,TR200	Polyol	International Pack.	Resin, urethane	203/847-5292	/ /
1243	IPS TR 250 Component (A)	4,4-MDI	International Pack.	Insulation	203/847-5292	09/30/83
1244	IPS TR 213 Comp B, TR 200 (SL)	Freon 11B	International Pack.	Urethane	203/847-5292	/ /
1245	TR 202,TR 213 Comp B	Freon 11B	International Pack.	Resin, urethane	203/847-5292	/ /
1246	Sterling Salt, Halite, Salt	Sodium Chloride	International Salt		717/587-5131	/ /
1247	Titanium sponge	Titanium	International Titanium	Alloy (sponge)	509/765-4436	11/08/85
1248	Endarc	Petroleum Distillate,hydrotrea	Intersurface	Fluid, machine	203/778-9995	01/09/90
1249	Endarc	Petroleum Hydrocarbon	Intersurface Dynamics	solvent	203-778-9995	08/01/90
1250	...F-77...	Cu >40%,Pb >7%,Zn <12%,Fe 35%	JPI	Alloy	313/663-6749	02/24/88
1251	Proprietary Solvent, Anhydrous	mixture ethyl alcohol	JT Baker Inc.	solvent	201-859-2151	03/28/88
1252	Cem T.C./High-Speed Steel Cutt	Steel,tungsten carbide	Jasco	Tool	716/546-6060	/ /
1253	Jurex 213 clear	Urethane prepolymer	Jennison Wright	Polyurethane	419/382-3411	/ /
1254	LL 702 M Lamilite	Polyvinylacetate	Jennison-Wright	Polyvinylacetate	419/382-3411	/ /
1255	Kreolite WoodBlock Cement 150T	Asphalt	Jennison-Wright	Cement	419/382-3411	/ /
1256	Penta	Pentachlorophenol	Jennison-Wright		419/382-3411	/ /
1257	Zinc	N/A	Jersey Miniere	Alloy	615/552-4200	11/25/85
1258	Nickel Base Alloys	Steel, nickel	Jessop	Alloy	412/222-4000	11/11/85

1259	Stainless Steels	Steel, stainless	Jessop	Alloy	412/222-4000	02/03/86
1260	Celite 545	Earth, flux calcined diatomac.	Johns-Manville		303/979-1000	/ /
1261	All Carbide Grades C-1 to C-14	TungstenCarbide mixed w/cobalt	Johnson Carb.	Metal Removal		11/25/85
1262	Nickel Sponge	Nickel	Johnson Matthey	Alloy (sponge)	0763/44161	/ /
1263	140 Stick Wax	Wax Combination	Johnson Wax	Lubricant	414/631-2777	03/15/85
1264	Come Clean	AlkaliMetasilicates+Carbonates	Johnson Wax	Caustic	414/631-2777	07/24/85
1265	Liquid Envy Instant Cleaner	Dipropylene Glycol Methyl Ethe	Johnson Wax	Cleaner, liquid	414/631-2777	08/21/85
1266	Aluminum Alloys	Aluminum	Jorgensen	Alloy	213/567-1122	04/11/88
1267	Carbon, Alloy, and Tool Steels	N/A	Jorgensen	Alloy	213/567-1122	04/11/88
1268	Stainless Steel	N/A	Jorgensen	Alloy	213/567-1122	04/11/88
1269	POlystyrene	N/A	K-S-H	Polystyrene	314/966-3111	01/22/86
1270	Aluminum Alloys	Aluminum-Lithium(.5%-3% Lith)	Kaiser	Alloy	415/271-5391	06/01/85
1271	Kano Kroil	oil	Kano	Lubricant, penetrant	615/833-4101	10/26/80
1272	Kasenit 1 & 2	Sodium Ferrocyanide	Kasenit		201/529-3663	/ /
1273	T-Series, Tri-Polar Sili Ename	Mineral Spirits 25-45%	Keeler & Long		203/274-6701	05/25/90
1274	Alum Oxide/TitanCarb-KO90	Aluminum Oxide 60-95%	Kennametal	Abrasive	412/539-5000	09/01/89
1275	Alum Oxide/Sili Carb-Kyon 2500	Aluminum Oxide 54-92%	Kennametal	Abrasive	412/539-5000	04/01/89
1276	Ceramic-Kyon 2000/3000,KennSia	Si6-zAlzOzN8-z 20-95%	Kennametal		412/539-5000	09/01/89
1277	K1...SP316	TungstenCarbide mixed w/Cobalt	Kennametal		412/539-5000	10/01/85
1278	SBC(AA-H),SBF(AA-H),SBS(AA-H)	Tool Steel	Kennametal	Alloy	412/539-5000	09/01/86
1279	TungstenCarbide/Co-KT125,KT150	Titanium Carbide 25-76%	Kennametal	Abrasive	412/539-5000	09/01/89
1280	TungstenCarbide/Co-K3H..999998	Tungsten Carbide 30-97.7%	Kennametal	Abrasive	412/539-5000	03/01/90
1281	Tunsten Carbide/Co-K1...TS181B	Tungsten Carbide 30-97.7%	Kennametal	Abrasive	412/539-5000	03/01/90
1282	TungstenCarbide/Co-K313..SP939	Tungsten Carbide 68-95.9%	Kennametal	Abrasive	412/539-5000	03/01/89
1283	TungCarb/Co-K701..WC/Co/Cr Spr	Tungsten Carbide 68-98.5%	Kennametal	Abrasive	412/539-5000	03/01/90
1284	Tung Carb/Co-K6T..WCCo pellets	Tungsten Carbide	Kennametal	Abrasive	412/539-5000	01/01/89
1285	Battery Electric Storage	Lead 43-70%, Sulf Acid 20-44%	Keystone Battery		617/729-8333	01/16/89
1286	Pipe Insualtion...Sill Sealer	Fibrous Glass 83-97%	Knauf Fiber Glass	Insulation	317/398-4434	12/10/87
1287	Coloredge Yellow Developer	Strontium Ferrite	Kodak	Developer	716/722-5151	03/05/90
1288	Kodak Prostar Plus Fixer	Ammonium Thiosulfate	Kodak	Fixer	716/722-5151	06/20/86
1289	Kodak Developer System Cleaner	SulfamicAcid,PotassiumDichroma	Kodak	Cleaner	716/722-5151	10/01/81
1290	Kodak Coloredge Magenta Develo	Strontium Ferrite 85-90%	Kodak	Developer	716/722-5151	03/05/90
1291	Kodak Prostar Plus Developer	Sodium Sulfite	Kodak	Developer	716/722-5151	11/04/87
1292	Kodak Coloredge Cyan Developer	Strontium Ferrite 85-90%	Kodak	Developer	716/722-5151	03/05/90
1293	Ultratec Fixer/Replenisher	Water/Ammon Thiosulf 40-50%	Kodak	Fixer/Replenisher	716/722-5151	12/05/83
1294	Ultratec Developer/Replenishe	Water 80-85%	Kodak	Developer/Replenishe	716/722-5151	10/11/88
1295	Kool Mist Formula 77	N/A	Kool Mist		213/802-2640	/ /
1296	Refined Quinoline	N/A	Koppers		800/556-7737	09/01/87
1297	Sodium Hypochlorite	N/A	Krevit	Neutralizing Agent	203/772-3350	09/01/87
1298	PT-32	Trisodium Phosphate	L/S		203/653-4220	/ /
1299	LPC-610R Zirconia Refrac Shape	Zirconia	LECO	Insulation	616/983-5531	11/13/85
1300	LPS Instant Super Cleaner/Degr	1,1,1-Trichlor 80-100%	LPS	Cleaner	404/934-7800	03/01/89
1301	LPS Power Shot	1,1,1-Trichlor 60-90%	LPS		404/934-7800	05/01/90
1302	LPS Paint and Gasket Remover	Methylene Chloride	LPS		404/934-7800	03/01/89
1303	LPS Tap-All	Water 80-90%	LPS		404/934-7800	03/01/89

1304	LPS Electro Comtact Cleaner	Trichlorotrifluoroethane 70-80	LPS	Cleaner	404/934-7800	02/01/90
1305	LPS 2 General Purpose Lubrican	Aliphatic Hydrocarbon 70%	LPS	Lubricant	404/934-7800	03/01/89
1306	LPS Force 842	1,1,1-Trichlor 80-85%	LPS		404/934-7800	01/31/90
1307	LPS 1 Greaseless Lubricant	Aliphatic Hydrocarbon 70-80%	LPS	Lubricant	404/934-7800	03/01/89
1308	LPS 500 Plus	N/A	LPS		404/934-7800	10/27/89
1309	LPS Chain Mate	1,1,1-Trichlor50-60PetOil30-40	LPS		404/934-7800	01/31/90
1310	LPS Instant Cold Galvanize	Zinc Metal 20-30%, many 10-20%	LPS		404/934-7800	03/01/89
1311	LPS Tron-All	Trichlorotrifluoroethane 40-50	LPS		404/934-7800	02/01/90
1312	LPS Gear Master	Asphalt 45-50,Isobut/Prop15-20	LPS		404/934-7800	01/31/90
1313	LPS3 Heavy-Duty Rust Inhibito	Aliphatic Hydrocarbon	LPS	Rust Inhibitor	404/934-7800	02/26/90
1314	LPS Precision Clean	Water 75-85%	LPS	Cleaner	404/934-7800	03/06/90
1315	LPS Heavy-Duty Silicone Lubric	Water 65-80%,AliphHydro 15-20%	LPS	Lubricant	404/934-7800	03/01/89
1316	LPS 3 Heavy Duty Rust Inhibito	Petroleum Hydrocarbons	LPS Laboratories	Rust Inhibitor	404-934-7800	03/01/88
1317	LPS HD Silicone Lubricant	Blended Compound	LPS Laboratories	Lubricant	404-934-7800	03/01/89
1318	LPS 2 GP Lubricant	Petroleum Hydrocarbon	LPS Laboratories	Lubricant	404-934-7800	05/01/89
1319	LPS 3 HD Rust Inhibitor	Petroleum Hydrocarbons	LPS Labrotories Inc.	Rust Inhibitor	404-934-7800	03/01/89
1320	Alloy Steel Remelt	Steel, alloy	LTV	Alloy	216/622-5242	11/08/84
1321	Electro-Galvanized Steel	N/A	LTV	Alloy	216/622-5242	10/20/84
1322	Galvanized Culvert Sheet Steel	Steel, galvanized	LTV	Alloy	216/622-5242	12/20/84
1323	Electrolytic Tin Coated Sheet	Steel, tin	LTV	Alloy	216/622-5242	01/11/85
1324	Electrolytic Chromium Coated	Steel, chrome	LTV	Alloy	216/622-5242	01/11/85
1325	Cold Rolled Stainless Steel	Steel, stainless	LTV	Alloy	216/622-5242	11/08/84
1326	Electrical Steel	Steel	LTV	Alloy	216/622-5242	12/20/84
1327	Hot/Cold Rolled Stainless Stee	Steel, stainless	LTV	Alloy	216/622-5242	11/14/84
1328	Hot/Cold Rolled Alloy Leaded	Steel, alloy leaded	LTV	Alloy	216/622-5242	11/15/84
1329	Hot/Cold Rolled Alloy Steel	Steel, alloy	LTV	Alloy	216/622-5242	11/15/84
1330	Long Terne Carbon Steel Sheet	Steel, carbon	LTV	Alloy	216/622-5242	11/13/84
1331	Hot/Cold Rolled C.S.-Bar&Wire	Steel, carbon	LTV	Alloy	216/622-5242	11/15/84
1332	Hot Dipped Galvanized Steel	Steel, galvanized	LTV	Alloy	216/622-5242	12/26/84
1333	Hot/Cold Rolled Carbon Leaded	Steel, carbon leaded	LTV	Alloy	216/622-5242	11/15/84
1334	Hot/Cold Rolled C.S-Sheet,etc.	Steel, carbon	LTV	Alloy	216/622-5242	12/26/84
1335	Nickel Based Alloy Steel	Steel, nickel	LTV	Alloy	216/622-5242	11/07/84
1336	Polycote Plastisol Coated GCSS	Steel, galvanized	LTV	Alloy	216/622-5242	12/20/84
1337	Stainless Steel Remelt	Steel, stainless	LTV	Alloy	216/622-5242	11/15/84
1338	Nickel Based Alloy Steel	Inconnel 600 and 625	LTV Steel Company	Alloy Steel	212/622-5542	11/07/84
1339	Anhydrous Ammonia	N/A	LaRoche	Gas	404/851-0300	11/01/86
1340	Fluorocarbon K-22	Chlorodifluoromethane	LaRoche	Gas	504/355-1260	06/01/85
1341	Alloyed Metal	Steel	Ladish	Alloy	414/747-3020	11/10/85
1342	Beryllium	N/A	Ladish	Alloy	414/747-3524	04/15/89
1343	Aluminum Alloys	N/A	Ladish	Alloy	414/747-3524	10/25/88
1344	Carbon Steel and Low Alloy	N/A	Ladish	Alloy	414/747-3524	10/28/88
1345	Copper-Nickel Alloys	N/A	Ladish	Alloy	414/747-3524	10/25/88
1346	Columbium	N/A	Ladish	Alloy	414/747-3524	11/10/85
1347	Copper-Beryllium Alloys	N/A	Ladish	Alloy	414/747-3524	10/15/88
1348	Haynes 25	Cobalt-based Alloys	Ladish	Alloy	414/747-3524	04/15/89

1349	Magnesium Alloys	N/A	Ladish	Alloy	414/747-3524	04/15/89
1350	High Density Alloys	N/A	Ladish	Alloy	414/747-3524	10/28/88
1351	Molybdenum	Non Ferrous Metal	Ladish	Alloy	414/747-3524	04/15/89
1352	Nickel	Nickel	Ladish	Alloy	414/747-3524	10/28/88
1353	Tungsten	N/A	Ladish	Alloy	414/747-3524	10/28/88
1354	Titanium Alloys	N/A	Ladish	Alloy	414/747-3524	10/28/88
1355	Stainless Steel	Steel, stainless	Ladish	Alloy	414/747-3524	10/15/88
1356	Marprox 1000 Sealer	Acetone	Ladish	Alloy	414/747-3524	04/15/89
1356	Marprox 1000 Sealer	Acetone	Lan-O-Sheen	Insulation	612/224-5681	03/17/83
1357	Sand	N/A	Lane Construction		203/235-3351	09/13/89
1358	4330 Modified	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1359	300M ESK	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1360	4625 M4	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1361	Lescalloy 300M	Steel, nickel	Latrobe	Alloy	412/537-7711	11/15/85
1362	Lescalloy 4330 + V	Steel, specialty	Latrobe	Alloy	412/537-7711	07/31/84
1363	HP9-4-30	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1364	HY TUF (Nai 1275)	Steel Alloy	Latrobe	Alloy	412/537-7711	07/31/84
1365	Lescalloy D6AC	Steel, chromium/molybdenum	Latrobe	Alloy	412/537-7711	11/15/85
1366	Modified 6304	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1367	HP9-4-20	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1368	Lescalloy 9310	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1369	Lescalloy 4340	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1370	Lescalloy 4330+V Modified (SAE	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1371	PWA 768	Steel Alloy	Latrobe	Alloy	412/537-7711	07/31/84
1372	UT-18	Steel, alloy	Latrobe	Alloy	412/537-7711	11/15/85
1373	Steel HS-100 M-42	Steel	Latrobe Steel Co.	Steel	412-537-7711	11/15/85
1374	Steel	High speed steel	Latrobe Steel Company	Steel	412-537-7711	03/13/86
1375	Steel Tatmo M-1	Steel	Latrobe Steel Company	Steel	412-537-7711	11/15/89
1376	Steel Double Six M-2	Steel	Latrobe Steel Company	Steel	412-537-7711	11/15/85
1377	Steel	Steel	Lavallee and IDE Inc.	High Speed Steel	802-655-1870	/ /
1378	Cemented TitanCarb w/ Ni/Mo	Titanium Carbide 30-90%	Lexington Cutter	Abrasive	516/431-4085	11/25/85
1379	Cemented T.C. Mixed w/ cobalt	Tungsten Carbide 56-97%	Lexington Cutter	Abrasive	516/431-4085	11/25/85
1380	75112-1658B W S Caustic Strip	Water	Lilly		317/634-8512	05/18/81
1381	Vitreus/Resinoid Grinding Whee	N/A	Lincoln	Abrasive	815/338-1080	08/29/89
1382	Moldatherm	Refractory Ceramic Fiber 97%	Lindberg	Insulation	414/261-7000	08/14/87
1383	Moldatherm	Alumina Silica	Lindburg	Ceramic Fiber	414-261-7000	08/14/87
1384	Argon	N/A	Liquid Air	Gas	415/977-6500	10/01/85
1385	Ammonia	N/A	Liquid Air	Gas	415/977-6500	10/01/85
1386	Acetylene	N/A	Liquid Air	Gas	415/977-6500	10/01/85
1387	Nitrogen	N/A	Liquid Air	Gas	415/977-6500	10/01/85
1388	Oxygen	N/A	Liquid Air	Gas	415/977-6500	10/01/85
1389	Chlorine	Halogen	Liquid Air Corporation		415-977-6500	10/01/85
1390	Carbon Dioxide Solidified	N/A	Liquid Carbonic	Gas	312/855-2500	/ /
1391	354 Adhesive	Polyurethane Methacrylate REsi	Loctite	Adhesive	203/278-1280	11/01/85
1392	Antiseize Thread Compound	Lubricant-Mil A907E	Loctite	Lubricant	203/278-1280	01/01/89
1393	Black Max Black Tough Adhesive	Ethyl Cyanoacrylate	Loctite	Adhesive	203/278-1280	01/29/90

1394	Anti-Seize Lubricant	Mineral Oil	Loctite	Lubricant	203/278-1280	11/01/85
1395	Adhesive/Sealant 222	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	01/01/89
1396	Adhesive/Sealant 271	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	01/01/89
1397	Anti-Seize Thread Compound 767	Mineral Oil 65-70%, Cu 10-15%	Loctite	Lubricant	203/278-1280	07/26/90
1398	Adhesive/Sealant 290	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	01/01/89
1399	277 Adhesive/Sealant	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	01/01/90
1400	Chisel Gasket Remover	Methylene Chloride	Loctite	Gasket Remover	203/278-1280	01/01/90
1401	Locquic Primer N-764-55/71	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	11/01/85
1402	Locquic Primer T 747-47-56	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	09/23/86
1403	Locquic Primer T 7474-71/75	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	11/01/85
1404	Locquic Primer N-764-56	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	11/01/85
1405	Instant Seal Plastic Gasket	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	11/01/85
1406	Locquic Primer T	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	11/01/85
1407	Locquic 747 Primer T (Aerosol)	1,1,1-Trichloroethane	Loctite	Primer	203/278-1280	11/09/88
1408	Instant Seal Pipe Sealant	Bisphenol A Fumarate Resin	Loctite	Insulation	203/278-1280	11/01/85
1409	Quick Metal Press Fit Repair	Dimethacrylate Ester	Loctite	Press fit repair	203/278-1280	11/01/85
1410	Quick Set 404 Industrial Adhes	Ethyl Cyanoacrylate	Loctite	Adhesive	203/278-1280	01/01/90
1411	Permatex Form-A-Gasket 1	Clay (kaolin)	Loctite	Gasket	203/527-5211	10/01/85
1412	Permatex Form-A-Gasket 2	Clay (kaolin)	Loctite	Gasket	203/527-5211	10/01/85
1413	Retaining Compound 609	Polyglycol Dimethacrylates	Loctite	Adhesive	203/278-1280	01/01/87
1414	Retaining Compound 635	Polyurethane Methacrylate Resi	Loctite	Adhesive	203/278-1280	11/01/85
1415	Removable Threadlocker 242	Polyglycol Dimethacryl 60-65%	Loctite	Adhesive	203/278-1280	12/04/90
1416	Retaining Compound 680	Dimethacrylate Ester	Loctite	Adhesive	203/278-1280	11/01/85
1417	Nickel Anti-Seize Lubricant	Mineral Oil 35-40%, Ni 15-20%	Loctite	Lubricant	203/278-1280	05/31/90
1418	Prism Ser 454 Surf I G Inst Ad	Ethyl Cyanoacrylate 85-90%	Loctite	Adhesive	203/278-1280	04/07/87
1419	Prism 454 Surf-Insens Inst Adh	Cyanoacrylate Ester	Loctite	Adhesive	203/278-1280	01/29/90
1420	Small Screw Threadlocker 222	Polyglycol Dimethacryl 55-60%	Loctite	Adhesive	203/278-1280	03/13/90
1421	Pipe Sealant W/Teflon	Bisphenol A Fumarat Res 25-30%	Loctite	Adhesive	203/278-1280	06/20/90
1422	Retaining Compound 640	Polyurethane Methacrylate Resi	Loctite	Adhesive	203/278-1280	01/01/89
1423	Pipe Sealant w/Teflon	Bisphenol A Fumarate Resin	Loctite	Insulation	203/278-1280	03/13/90
1424	Prism 410 Black Tough Inst Adh	Ethyl Cyanoacrylate	Loctite	Adhesive	203/278-1280	01/29/90
1425	Prism 460 Low Odor/Bloom Inst	Cyanoacrylate Ester	Loctite	Adhesive	203/278-1280	01/29/90
1426	Superbonder 495 Instant Adhesi	Ethyl Cyanoacrylate	Loctite	Adhesive	203/278-1280	11/01/85
1427	Anti-Seize Thread Compound 767	Mixture- Mineral Oil, Copper	Loctite Corp.	Thread Compound	203-278-1280	10/31/90
1428	Qiuck Set 404 Ind. Adhesive	Cyanoacrylate Ester	Loctite Corperation	Adhesive	203-278-1280	05/14/90
1429	Small Screw Threadlocker 222	Mixture	Loctite Corperation		203-278-1280	03/13/90
1430	Grade A Sealant	Mixture	Loctite Corporation	Sealant	203-278-1280	04/29/90
1431	Chisel Gasket Remover	mixture-methylene chloride	Loctite Corporation	Solvent	203-278-1280	06/14/90
1432	Locquic (R) Primer T	Aerosol Primer	Loctite Corporation	Primer	203-278-1280	07/11/90
1433	Nickel Anti-Seize Lubricant	Mixture	Loctite Corporation	Lubricant	203-278-1280	05/31/90
1434	Pipe Sealant W/Teflon (R)	Mixture	Loctite Corporation	Pipe Sealant	203-278-1280	06/20/90
1435	Removable Threadlocker 242	Mixture	Loctite Corporation		203-278-1280	07/06/90
1436	Removable Threadlocker 242	Mixture	Loctite Corporation		203-278-1280	10/31/90
1437	Lonconite MSP-1611	Lubricating Compound	London Chemical	Lubricant	312/287-9477	/ /
1438	"Louisville" Fire Brick	N/A	Louisville	Insulation	502/363-2656	/ /

1439	LFB-60 Fire Brick Shapes	N/A	Louisville	Insulation	502/363-2656	/ /
1440	LFB-HD Fire Brick Shapes	N/A	Louisville	Insulation	502/363-2656	/ /
1441	LFB-SD Fire Brick Shapes	N/A	Louisville	Insulation	502/363-2656	/ /
1442	All Carbide Grades	TungstenCarbide mixed w/cobalt	Lovejoy	Metal Removal	802/885-2194	11/20/85
1443	Duro AW Oil 68	Petroleum Hydrocarbons	Lyondell Petrochemical Co.	Oil	713-475-4215	03/03/88
1444	M & T NiChem PF-500-A	Nickel Sulfate 65-75%	M & T Chem.		201/499-2403	03/28/86
1445	Metco 450, 450 NS	Nickel Based Powder	METCO	Powder Spray Process	516/334-1300	11/25/85
1446	Metco 444	Nickel Based Powder	METCO	Powder Spray Process	516/334-1300	11/25/85
1447	Metco 45C-NS, 45VF-NS	Cobalt Base Chromium Nickel	METCO	Alloy Powder	516/334-1300	11/25/85
1448	Metco 202NS	Zirconium Oxide Composite Powd	METCO	Powder Spray Process	516/334-1300	05/24/89
1449	Metco 301-NS, 301C-NS	Boron Nitride	METCO	Powder Spray Process	516/334-1300	06/25/86
1450	Metco 447,447NS	Nickel Based Powder	METCO	Powder Spray Process	516/334-1300	11/25/85
1451	Metco 443, 443NS	Nickel Chromium Alloy Comp.	METCO	Powder Spray Process	816/334-1300	11/25/85
1452	Metco 52C-NS	Silicon Aluminum Alloy Powder	METCO	Alloy Powder	516/334-1300	05/24/89
1453	Metco 601NS	Aluminum Poly-P-Oxybenzate	METCO	Powder Spray Process	516/334-1300	11/25/85
1454	Metco 81VF-NS Powder Blend	Chromium Carbide-nickel chromi	METCO	Thermal Spray Proces	516/334-1300	05/23/83
1455	Metco 610NS, 605NS, 604NS	Aluminum Bronze Polyester	METCO	Powder Spray Process	516/334-1300	11/25/85
1456	Metco 81NS,81VF, 82VF	Chromium Carbide-Nickel Chrom.	METCO	Powder Blend	516/334-1300	11/25/85
1457	Durad Blue Metalustre	Arom Hydro 29.1%,Heptane 28.5%	Maas & Waldstein	Coating (enamel)	201/484-1600	02/02/88
1458	Ferrodex 8	Sodium Hydroxide	MacDermid	Cleaner, metal	203/575-5700	/ /
1459	Kembrass Maint. Solution	Sodium-Copper-Zinc Cyanide	MacDermid	Cyanide	203/575-5700	11/01/85
1460	Keltex CU	Aqua Ammonia	MacDermid	Copper Cyanide Baths	203/575-5700	11/01/85
1461	Kemtex 195DA	Sodium Hydroxide	MacDermid	Cleaner, metal	203/575-5700	11/01/85
1462	Rotex 464	Alkaline, mild	MacDermid	Cleaner	203/575-5700	/ /
1463	Rotex 993B	Alkaline, mild	MacDermid	Cleaner	203/575-5700	/ /
1464	Rotex 95		MacDermid	Burnishing Compound	203/575-5700	11/01/85
1465	Rocheltex	N/A	MacDermid	Organic Salt	203/575-5700	07/18/88
1466	Ferrodex 8	Alkaline Steel Electro	MacDermid of Bristol Inc.	Cleaner	203-583-1881	/ /
1467	7C Black Magnaflux Concentrate	Iron Oxide base	Magnaflux	brazing flux	708-867-8000	04/25/90
1468	14A Magnaglo Powder	Iron Oxide	Magnaflux		312/867-8000	05/01/89
1469	14A Magnaglo Powder	mixture	Magnaflux	powder	708-867-8000	04/25/90
1470	ZL-37 Zyglo Penetrant	Middle Distillates ~10%	Magnaflux	Penetrant	312/867-8000	07/17/86
1471	Magnesium Alloy	Magnesium,thorium	Magnesium Electron	Alloy	201/782-5800	12/03/85
1472	HZ32A Magnesium Alloy	Mg 93.1%,Zr,Z,THORIUM,Rare Ear	Magnesium Elektron	Alloy	201/782-5800	05/16/86
1473	ZE41A Magnesium Alloy	Mg 93.8%,Zr,Z,Rare Earths	Magnesium Elektron	Alloy	201/782-5800	05/16/86
1474	ZH62A Magnesium Alloy	Mg 92.1%,Zr,Z,THORIUM,Rare Ear	Magnesium Elektron	Alloy	201/782-5800	05/16/86
1475	Perfect Data Antistat	Cationic Solution	Maintex	Cleaner	818/961-1988	08/10/87
1476	Plastic Cleaning Solution	Glycol Ether DPM, DGME	Maintex	Cleaner	818/961-1988	03/12/87
1477	Perfect Data Plastic Cleaning	Glycol Ether DPM, DGME	Maintex	Cleaner	818/961-1988	10/14/88
1478	Video Display Cleaner	Isopropanol, Glycol Ether EB	Maintex	Cleaner	818/961-1988	03/07/87
1479	Acetonitrile	N/A	Mallinckrodt	Acid (acetic)	314/982-5000	04/16/86
1480	Ferric Chloride	Ferric Chloride	Mallinckrodt		314-982-5000	08/07/85
1481	Hydrochloric Acid 37%	Hydrochloric Acid	Mallinckrodt	Plating	314-982-5000	09/10/86
1482	Nitric Acid 70%	Nitric Acid	Mallinckrodt	Plating	314-982-5000	10/21/86
1483	Sulfuric Acid 93%	Sulfuric Acid	Mallinckrodt	Plating	314-982-5000	10/21/86

1484	All Tool C Grades exc Coba/Nic	TungstenCarbide mixed w/cobalt	Manchester	Metal Removal	216/644-8853	02/01/86
1485	Cemented Carbide w/ Co binder	Tungsten Carbide 30-97.7%	Manchester Tool	Abrasive	216/644-8853	02/01/86
1486	Cemented Carbide w/ Co/Ni bind	Tungsten Carbide 75-96%	Manchester Tool	Abrasive	216/644-8853	02/01/86
1487	Methanol	Methanol	Manufacturing Chem.	Solvent	202/483-6126	06/01/74
1488	CT-1 Pump Packing	Asbestos Fibers	Manville	Insulation	303/978-4900	10/22/85
1489	Duxseal	Asbestos Fibers, chrysotile	Manville	Insulation	303/978-3120	12/13/85
1490	Celite 523,526,535P,...579	Earth,flux calc. diatomaceous	Manville		303/978-4900	03/10/88
1491	Duxseal (Non-Asbestos)	Talc	Manville	Insulation	303/978-3120	05/22/86
1492	Microlite-R Series	Fibrous Glass 89%	Manville	Insulation	303/978-3120	10/05/87
1493	Perma-Weld Adhesive	Acetone+Tetrahydrofuran=80%	Manville	Adhesive	303/978-3120	02/24/86
1494	Star Stran 755,758	Glass, fibrous	Manville		303/978-4900	01/02/90
1495	Ball Paint Markers-All Colors	Propylene Glycol Monomethyl Et	Markal		312/826-1700	03/28/89
1496	Brass	Half hard,soft,Hr naval,muntz	Marmon	Alloy	412/283-3000	01/01/88
1497	Aluminum Alloy	Series 1000-7000 (not 4000)	Marmon/Keystone Corp.	Alloy	412/283-3000	01/01/91
1498	Carbon and Alloy Steels	Grades 10xx thru 93xx	Marmon/Keystone Corp.	Alloy	412/283-3000	01/01/91
1499	Chrome Plated Carbon Steel	Chrome Plated 1045,1050	Marmon/Keystone Corp.	Alloy	412/283-3000	01/01/91
1500	Nickel Based Alloy Steel	200,400,600,800 Series	Marmon/Keystone Corp.	Alloy	412/283-3000	01/01/91
1501	Stainless Steels	Grades 300+400 Ser, spec alloy	Marmon/Keystone Corp.	Alloy	412/283-3000	01/01/91
1502	Sulfuric Acid	N/A	Marsulex	Acid	203/854-0300	11/01/88
1503	Aluminum Electrolyte	N/A	Martronics	Cleaner	206/985-2999	/ /
1504	Brass,Copper,Bronze Electrolyt	N/A	Martronics	Cleaner	206/985-2999	/ /
1505	Black Oxide Electrolyte	N/A	Martronics	Cleaner	206/985-2999	/ /
1506	General Purpose Electrolyte	N/A	Martronics	Cleaner	206/985-2999	/ /
1507	Neutralizer	N/A	Martronics	Cleaner	206/985-2999	/ /
1508	Stainless Steel Electrolyte	N/A	Martronics	Cleaner	206/985-2999	/ /
1509	Marvel Mystery Oil	Petroleum Hydrocarbons	Marvel	Oil, mystery	914/937-4000	/ /
1510	Marvel Air Tool Oil	Petroleum Products-mixture	Marvel Oil	Lubricant	914/937-4000	10/24/85
1511	Trim Sol	N/A	Master	Metal Removal	419/874-7902	08/01/88
1512	Trim LP 259	Chemical Fluid	Master	Lubricant/Coolant	419/874-7902	11/01/88
1513	Trim VX	N/A	Master	Metal Removal	419/874-7902	03/01/86
1514	Trim RD2-267	Synthetic Chemical fluid	Master	Coolant, Lubricant	419/874-7902	05/01/89
1515	EP30M3LV	Epoxy Resin 62%, M.P.A. 32%	Master Bond	Polyamine Adduct Cur	201/343-8983	/ /
1516	All Cem Tungsten Carbide Grade	TungstenCarbide mixed w/cobalt	Master-Cut	Metal Removal	313/525-9305	11/25/85
1517	High Speed/Specialty Steels	Steel, high speed/specialty	Master-Cut	Alloy	313/525-9305	/ /
1518	Helium	N/A	Matheson	Gas	201/933-2400	10/01/85
1519	Cee-Bee A-7X7	Glycol Ether	McGean Rohco	Cleaner	213/803-4311	06/01/80
1520	Cee-Bee Cleaner C-100	N/A	McGean Rohco	Cleaner	213/803-4311	03/01/83
1521	Cee-Bee A-481	Dipropylene Glycol Monometh Et	McGean Rohco	Paint Remover	213/803-4311	09/01/83
1522	Cee Bee J-84L	Sodium Hydroxide	McGean Rohco	Cleaner, metal	213/803-4311	10/01/86
1523	Cee-Bee Cleaner A-700	Diethylene Glycol Monobutyl Et	McGean Rohco	Cleaner	213/803-4311	03/01/83
1524	Cee-Bee Cleaner Solvent A-916	Ethylene Glycol Monobutyl	McGean Rohco	Cleaner	213/803-4311	08/01/85
1525	Cee-Bee J-84a	Sodium Hydroxide	McGean Rohco	Cleaner, metal	213/803-4311	03/01/79
1526	Cee-Bee J-88A	Sodium Hydroxide	McGean Rohco	Cleaner, metal	213/803-4311	02/01/79
1527	Cee-Bee MX-39G	Sodium Chromate	McGean Rohco	Cleaner	213/803-4311	09/01/79
1528	Cee-Bee Remover J-84aL	Sodium Hydroxide	McGean Rohco	Cleaner, metal	213/803-4311	09/01/85

1529	Cee-Bee Scale Condition J-88L	Sodium Hydroxide	McGean Rohco	Cleaner, metal	213/803-4311	03/01/83
1530	Norsol Coolant 931	N/A	McGean Rohco	Coolant	216/441-4900	06/01/85
1531	Norsol Soluble Oil 931	Hexylene Glycol	McGean Rohco	Oil, soluble	213/803-4311	04/01/85
1532	Cee-Bee J-84L Concentrate	Sodium Hydroxide 40-50%	McGean-Rohco	Cleaner	213/803-4311	05/01/89
1533	Cee Bee Additive GO-2L	N/A	McGean-Rohco		213/803-4311	03/01/90
1534	Cee-Bee J-84	Sodium Hydroxide 70-80%	McGean-Rohco	Cleaner	213/803-4311	05/01/89
1535	Cee Bee C-46	Sodium Hydroxide 50-75%	McGean-Rohco	Cleaner	213/803-4311	02/01/90
1536	Cee Bee J-88 Additive P	Potassium Permanganate >95%	McGean-Rohco	Cleaner	213/803-4311	10/01/86
1537	Cee-Bee Cleaner R-674	Aromatic Petrol Solvent 70-80%	McGean-Rohco	Cleaner	213/803-4311	02/01/90
1538	Cee Bee Permang Scale Con J-88	Sodium Hydroxide 65-85%	McGean-Rohco	Cleaner	213/803-4311	10/01/86
1539	Cee-Bee Cleaner A-7X7NC	Sodium Metasilicate <2%	McGean-Rohco	Cleaner	213/803-4311	12/01/89
1540	Cee-Bee Cleaner A-54LF	Sodium Metasilicate 10-20%	McGean-Rohco	Cleaner	213/803-4311	03/01/90
1541	Battery Cleaner Leak Detector	mixture	Mechanics Choice	Cleaner	215-643-6020	12/15/89
1542	Grind-O-Flex	Aluminum Oxide Coated Cloth	Merit Abrasive Products	Abrasive	213-774-6650	06/16/86
1543	Flex Drum Loadings	Aluminum Oxide, Cotton Cloth	Merit Abrasive Products	Abrasive	213-774-6650	06/16/86
1544	Power Lock Discs	Aluminum Oxide Cloth Backing	Merit Abrasive Products	Abrasives	213-774-6650	06/16/86
1545	Shur Stik, PSA Discs	Aluminum Oxide, Cotton Cloth	Merit Abrasive Products	Abrasive	213-774-6650	06/16/86
1546	Belts	Aluminum Oxide Resin Binder	Merit Abrasive Products Inc.	Abrasive	213-774-6650	06/16/86
1547	Power Flex Discs	Aluminum Oxide, Zirconia	Merit Abrasive Products Inc.	Abrasive	213-639-4242	08/04/89
1548	Shop Rolls, Sheets	Aluminum Oxide, Cloth, Resin	Merit Abrasive Products Inc.	Abrasive	213-774-6650	06/16/86
1549	Overlap Slotted Discs	Aluminum Oxide, Resin binder	Merit Abrasive Products Inc.	Abrasive	213-774-6650	06/16/86
1550	Cartridge Rolls	Aluminum Oxide, Resin Binder	Merit Abrasives Products	Abrasive	213-774-6650	06/16/86
1551	Silicon Carbide Zinc Sheets	Silicon Carbide, Zinc, Resin	Merit Abrasives Products Inc.	Abrasive	213-774-6650	06/16/86
1552	Resin Fiber Discs	Aluminum Oxide, Fiber, Resin	Merit Abrasives Products Inc.	Abrasives	213-774-6650	06/16/86
1553	All Metal Removal Carbide Grad	Tungsten Carbide,copper	Metal Removal	Metal Removal	501/636-0539	09/01/89
1554	Metco 58NS	Copper Nickel Indium Powder	Metco	Metal Powder	516-334-1300	08/15/89
1555	Metco 439NS	Nickel Aluminide Blend	Metco	Flame Spray	516-334-1300	01/18/88
1556	Metco 404	Nickel Aluminide Powders	Metco	Metal Powder	516-334-1300	08/15/89
1557	Metco 63/63NS/64/65	Molybdenum Powder	Metco	Metal Powder	516-334-1300	08/15/89
1558	Metco 71NS, 71VF-NS-1	Tungsten Carbide Cobalt Powder	Metco	Metal Powder	516-334-1300	08/15/89
1559	Metco 301NS	Boron Nitride Cement Powder	Metco	Flame Spray	516-334-1300	01/18/88
1560	Metco 45C-NS, 45VF-NS	Cobalt Alloy Powder	Metco	Metal Powder	516-334-1300	08/15/89
1561	Metco 81NS, 81VF-NS, 82VF-NS	Nickel Chromium Powder	Metco	Metal Powder	516-334-1300	08/15/89
1562	Metco 204NS, 204B-NS	Zirconia Powder	Metco	Metal Powder	516-334-1300	01/18/88
1563	Metco 105, 105NS, 105NS-1	White Alumina Powder	Metco	Ceramic Powder	516-334-1300	08/15/89
1564	Metco 43C, 43C-NS, 43F-NS	Nickel Chromium Alloy Powder	Metco	Metal Powder	516-334-1300	08/15/89
1565	Metco 204-NS, 204B-NS	Yttria Stabilized Zirconia	Metco	Metal Powder	516-334-1300	01/18/88
1566	Metco 405, 405NS	Nickel Aluminide Wire	Metco	Flame Spray	516-334-1300	08/15/89
1567	Durex Roof Cement	Heavy Naphtha 52%	Metropolitan Roofing	Adhesive	212/665-3700	05/01/87
1568	Micro-mesh Anti-Static Cream	N/A	Micro-Surface Finishing Produc	Lubricant	319/732-3240	/ /
1569	Micro-mesh Abrasives	N/A	Micro-Surface Finishing Produc	Abrasive	319/732-3240	/ /
1570	BrakeLining B&R/NA,FV/NA,MX/NA	Kevlar/Phenolic Resin 15-25%	Midwest Brake & Bond	Brake Component	313/775-3000	03/15/86
1571	Cutting Fluids	Nitrosamines in Cutting Fluids	Milacron	Bulletin	513/841-8181	10/25/76
1572	Cimclean 30NN	N/A	Milacron	Cleaner	513/841-8181	/ /
1573	Cimcool S4 Cutting Fluid	N/A	Milacron	Fluid, cutting	513/841-8181	/ /

1574	Brass	Copper	Millard	Alloy	203/621-0171	07/01/87
1575	MS 260 Cleaner	mixture	Miller Stephenson	cleaner	203-797-2212	/ /
1576	MS-230 Contact Re-Nu	Trichloro/Dichlorodifluorometh	Miller Stephenson	Solvent, Cleaner	203-797-2212	/ /
1577	MS-180 Freon TF Solvent	Trichloro/Dichlorodifluorometh	Miller-Stephenson	Solvent	203-797-2212	/ /
1578	MS-190 Flux Remover	Methyl.Chl.,trichlorotrifluoro	Miller-Stephenson	Flux Remover	203/743-4447	02/19/85
1579	MS-230 Contact Re-Nu	Trichlorotrifluoroethane 80%	Miller-Stephenson		203/797-2212	01/01/89
1580	MS-111 Stripping Agent	Methylene Chloride	Miller-Stephenson	Epoxy Stripper	203/797-2212	01/01/89
1581	MS-260 Cleaner:Plastic/Glass/M	Ethanol 20%	Miller-Stephenson	Cleaner	203/797-2212	01/01/89
1582	MS-260	Cleaner	Miller-Stephenson	Cleaner	203-797-2212	01/01/89
1583	MS-180	Hydrogenated Hydrocarbon	Miller-Stephenson	Freon Solvent	203-797-2212	01/01/89
1584	All Carbide Grades	TungstenCarbide mixed w/cobalt	Milling	Metal Removal	313/776-2980	11/01/85
1585	Gray Iron Casting	ASTM A48-Classes 40B,45B,50B	Minster	Alloy	419/628-2331	10/18/85
1586	Black Magic B,C "Activ.""Plus"	Sodium Hydroxide	Mitchell Bradford		203/878-0671	03/17/89
1587	Rectifier L-2	Sodium Thiocyanate, Water	Mitchell Bradford		203/878-0671	12/19/86
1588	Activated Black Magic Plus	Sodium Hydroxide	Mitchell Bradford Internationa	Plating	203-878-0671	03/17/89
1589	Rust Pel 2	Petroleum Hydrocarbons	Mitchell-Bradford	Rust Preventive	203/878-0671	/ /
1590	Aviation Gasolines	Gasoline, aviation	Mobil	Fuel, aircraft engin	212/883-4411	12/01/84
1591	Automotive Gasolines	Gasoline	Mobil	Fuel, motor	212/883-4411	12/01/84
1592	Diesel Fuels	Petroleum Distillates	Mobil	Oil, fuel	212/883-4411	09/01/84
1593	Mobil DTE Oil Heavy	Refined Mineral Oil	Mobil	Oil, heavy	212/883-4411	06/21/84
1594	Mobil Jet Oil 254	Syn. Hydrocarbons and Additive	Mobil	Lubricant,jet turbin	212/883-4411	08/28/89
1595	Mobil Jet Oil II	N/A	Mobil	Lubricant	609/737-4411	04/07/90
1596	Mobil Hydraulic Oil AW 68	Base Oils >95%	Mobil	Lubricant	800/662-4525	06/29/90
1597	Mobil DTE 20 Series 24,25,26	Mineral Oils, refined	Mobil	Oil, Hydraulic	212/883-4411	/ /
1598	Jet 4 Turbine Fuel, Avia JP4	Naphtha,kerosine	Mobil	Fuel, jet	212/883-4411	05/28/82
1599	Mobil SHC 634	Amine/Amide Mixture	Mobil	Oil, lube	212/883-4411	03/14/85
1600	Mobil DTE Oil Light	Mineral Oils, refined >95%	Mobil	Lubricant	212/883-4411	12/18/85
1601	Mobil Vactra Oil 2	Base Oils >95%	Mobil	Lubricant	800/662-4525	07/24/90
1602	Mobil Vacuoline 1409	Mineral Oils, refined >90%	Mobil	Lubricant	212/883-4411	01/03/85
1603	Mobil Hydraulic Oil AW 46	Base Oils >95%	Mobil	Lubricant	800/662-4525	07/24/90
1604	Heating Oils	Petroleum Distillates	Mobil	Fuel Oil	212/883-4411	09/01/84
1605	Mobil DTE 13	Petroleum Hydrocarbons	Mobil	Oil, hydraulic	212/883-4411	04/16/85
1606	Mobil Vaprotec Concentrate	Mineral Oils, refined	Mobil	Rust Inhibitor	212/883-4411	03/21/85
1607	Mobil DTE 25	Petroleum Hydrocarbons	Mobil	Oil, hydraulic	212/883-4411	03/16/83
1608	Mobil Hydraulic Oil AW 32	Petroleum Distillates >95%	Mobil	Lubricant	800/662-4525	07/17/90
1609	Mobil Velocite Oil 6	Petroleum Distillates >95%	Mobil	Lubricant	800/662-4525	06/29/90
1610	Mobil Delvac Special 20W-40	Mineral Oils, refined	Mobil	Lubricant	212/883-4411	06/21/84
1611	Mobil Vacuoline 1405	Petroleum Hydrocarbons	Mobil	Lubricant,machine	212/883-4411	/ /
1612	Kerosine Jet Fuels	Kerosine	Mobil	Fuel,AviationTurbine	212/883-4411	09/01/84
1613	Mobil Aero HFA	Mineral Oils, refined	Mobil	Lubricant	212/883-4411	12/02/85
1614	Mobil DTE 26	Mineral Oils, refined	Mobil	Lubricant	212/883-4411	03/16/83
1615	Mobil Mist Lube 27	Petroleum Hydrocarbons	Mobil	Lubricant,industrial	212/883-4411	01/12/89
1616	Mobilux 2	Petroleum Distillates >90%	Mobil	Lubricant	800/662-4525	06/29/90
1617	Mobil DTE 24	Petroleum Hydrocarbons	Mobil	Oil, hydraulic	212/883-4411	08/25/83
1618	Phosphoric Acid	N/A	Mobil	Acid	212/883-4411	/ /

1619	Residual Fuels	Petroleum Residuals	Mobil	Fuel,Indust./Marine	212/883-4411	09/01/84
1620	S3612-808	Mixture	Mobil	Epoxy	212/883-4411	04/07/83
1621	Zinc Chromate Grease	Zinc Chromate	Mobil	Lubricant	212/883-4411	06/02/78
1622	T336 Thinner	Methyl Ethyl Ketone MEK	Mobil	Paint Thinner	212/883-4411	04/07/83
1623	Kerosine Jet Fuel	Hydrocarbons and Additives	Mobil	Jet Fuel	609-737-4411	09/12/90
1624	Mod Bond	Methylene Chloride	Modern Plastics	Acrylic Cement	203/333-3128	07/01/89
1625	Aluminum Alloys	N/A	Mohawk	Alloy	203/265-1567	06/16/89
1626	Copper/Copper Alloys	N/A	Mohawk	Alloy	203/265-1567	06/16/89
1627	Micarta	Glass cloth,paper,silicon,etc.	Mohawk	???????	203/265-1567	06/16/89
1628	Nickel Base Alloy	Nickel	Mohawk	Alloy	203/265-1567	06/16/89
1629	Stainless Steel	N/A	Mohawk	Alloy	203/265-1567	06/16/89
1630	Cool-Tool	Oil Mixture	Monroe	Fluid	716/392-3434	10/01/85
1631	Fe,Ni,Co based Super Alloys	N/A	Monroe	Alloy	716/328-1383	04/01/86
1632	Low Alloy Steels	Iron 87-99%	Monroe	Alloy	716/328-1383	04/01/86
1633	Nickel and Monel Alloys	Nickel 1-99%	Monroe	Alloy	716/328-1383	04/01/86
1634	Titanium Alloys	Titanium 73-99%	Monroe	Alloy	716/328-1383	04/01/86
1635	Stainless Steels - All Grades	Iron 40-99%, Chromium 10-35%	Monroe	Alloy	716/328-1383	04/01/86
1636	Low Alloy Steels	Metals	Monroe Forgings	Metal	716-328-1383	05/01/86
1637	Iron, Nickel, Cobalt Alloys	Metals	Monroe Forgings	Metal	716-328-1383	05/01/86
1638	Nickel and Monel Alloys	Metals	Monroe Forgings	Metal	716-328-1383	05/01/86
1639	Titanium Alloys	Metals	Monroe Forgings	Metal	716-328-1383	05/01/86
1640	Stainless Steel All Grades	Metals	Monroe Forgings	Metal	716-328-1383	05/01/86
1641	Methanol	Methonal	Monsanto	Solvent	314/694-1000	11/01/83
1642	Muriatic Acid	Hydrochloric Acid	Monsanto	Acid	314/694-1000	02/07/84
1643	Skydrol 500B-4 Fire Res Hyd Fl	N/A	Monsanto	Fluid, hydraulic	314/694-1000	11/01/83
1644	Metal Cut Tool From M-42,T-15	N/ALS MADE FROM M-42 T-15	Moon	Tools, cutting	203/288-9249	/ /
1645	Morse cutting Tools	Tungsten Carbide	Morse	Metal Removal	617/994-9611	11/25/85
1646	Cutting Tools	Ferrous Non-ferrous Metals	Morse Cutting Tools	Cutting Tools	617-994-9611	11/25/85
1647	Morse Cutting Tools	Alloys	Morse Cutting Tools	Cutting tools	617-994-9611	11/25/85
1648	Morplas Red 46	Anthraquinone Dye	Morton International	Dye	312-807-3273	12/05/86
1649	122 MSDS in a book	N/A	Multigraphics	Graphics?	708/870-5121	04/01/89
1650	Titanium	N/A	NF & M	Alloy	412/774-9200	08/15/84
1651	Nachi-High Speed Tool & Die	N/A	Nachi-Fujikoshi	Alloy	03/435-5111	11/01/85
1652	Optimer 7111 Dry Flocculant	N/A	Nalco	Copolymer	312/961-9500	09/10/88
1653	Nalclear 7763 Flocculant	Paraffinic/naphthenic solvent	Nalco	Polymer	312/961-9500	02/03/88
1654	B-Grade Star Stran	Inorganic Mixture	Nanville Sales Corp.	Continuous Filament	303-978-4900	01/02/90
1655	Liquefied Petroleum Gas or Pro	N/A	National Distillers & Chemical	Gas		/ /
1656	M-500-3	Asbestos, chrysotile	National Fric.	Insualtion	219/753-6391	11/25/85
1657	Lead and Lead Compounds	Lead	National Fric.	Alloy	219/753-6391	11/25/85
1658	NF-210-2	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1659	NF-270	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1660	NF-207-1	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1661	NF-203	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1662	NF-216-1	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1663	NF-201	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	02/07/85

1664	NF-270-A	Asbestos	National Fric.	Insulation	219/753-6391	/ /
1665	NF-282-1-HS	Asbestos, chrysotile	National Fric.	Insulation	219/753-6391	11/25/85
1666	NF-247 Friction Material	N/A	National Friction Products	Insulation	219/753-6391	01/31/86
1667	NF-406A Friction Material	Lead and Lead Compounds 38%	National Friction Products	Insulation	219/753-6391	11/25/85
1668	Grinding Wheel	Resin Bonded	National Grind.	Abrasive	618/548-4200	03/01/89
1669	Grinding Wheel	Vitrified Bonded	National Grind.	Abrasive	618/548-4200	03/01/89
1670	Shellac..."EX"	Shellac-bonded abrasive	National Grind.	Abrasive	618/548-4200	12/02/85
1671	Natalite..."V"	Vitrified-bonded abrasive	National Grind.	Abrasive	618/548-4200	05/21/86
1672	Nataflex..."BNC"	Glass,woven/fibrous	National Grind.	Abrasive	618/548-4200	11/25/85
1673	Bulk Lysol Brand Disinfectant	Ethyl Alcohol	National Labs	Disinfectant	201/573-5700	09/05/85
1674	Tru Grit/Permasteel	Steel	National Metal Abrasive	Abrasive	216/334-1566	10/01/86
1675	262WP Porcelene	2-Propanol	National Mill.	Cleaner	215/482-6600	/ /
1676	234WP Alpha	N/A	National Mill.	Coating, floor	419/666-8610	04/18/84
1677	Fluid Extract Ipecac, USP XVI	N/A	National Pharmaceutical	Medical	301/298-1000	/ /
1678	Plastic K-KN	Trivalent Chromium,Na silicate	National Refrac.		415/462-1122	01/30/85
1679	BB Breeze NI-835	Ethyl Alcohol	Neutron	Disinfectant/Deodor.	216/861-7114	10/01/85
1680	BB Brute	Ethylene glycol monobutyl ethe	Neutron	Cleaner	216/861-7114	01/01/89
1681	Graffiti Gone	Xylene <50%, MEK <45%	Neutron	Graffiti Remover	216/861-7114	10/01/85
1682	Germicidal Giant	Propane,isobutane	Neutron	Cleaner,deod.,disinf	216/861-7114	01/01/89
1683	Dry Spice	Propellant>85%:Propane+Butanes	Neutron	Air Freshener/Deodor	216/861-7114	04/01/88
1684	Flush-N-Clean Urinal Blocks...	N/A	Neutron	Deodorant/Cleaning	602/867-8010	03/01/87
1685	Citrus Power	Terpene Type Citrus Oil <70%	Neutron	Cleaner/Degreaser	216/861-7114	05/01/88
1686	Finish Buster	Trisodium Phosphate <3%	Neutron	Floor Stripper	216/861-7114	06/01/86
1687	Mint Action	Phosphoric Acid <15%	Neutron	Cleaner, toilet bowl	216/861-7114	11/01/85
1688	Smooth Move	Trichlorotrifluoroethane <65%	Neutron	Lubricant, silicone	216/861-7114	11/01/85
1689	Orange and Strawberry	Terpene Type Citrus Oil >75%	Neutron	Odor Eliminator	216/861-7114	10/01/87
1690	Naturally Peach	N/A	Neutron	Deodorant	216/861-7114	04/01/89
1691	Resolve Aerosol	Methylchloroform <73%	Neutron	Solvent Degreaser	216/861-7114	06/01/86
1692	Sudden Impact Aerosol	Deodorized Kerosene 58.5%	Neutron	Insecticide	216/861-7114	02/01/87
1693	Versatile	Phosphoric Acid <10%	Neutron	Cleaner, bathroom	216/861-7114	11/01/85
1694	Sprinkle Fresh	N/A	Neutron	Rug/Room Deodorizer	216/861-7114	06/01/86
1695	Wet Look	D.G.M.E. <4%	Neutron	Floor Finish	216/861-7114	11/01/85
1696	Touch of Spice	N/A	Neutron	Room Deodorizer	216/861-7114	01/01/87
1697	Finish Buster	Formulated Floor Stripper	Neutron Industries Inc	Floor stripper	800-421-8481	06/01/86
1698	Applescent NI-712 Family	Formulated Odor Eliminator	Neutron Industries Inc.	Odor Eliminator	216-861-7114	06/01/90
1699	BB Brute	Cream Cleaner Mild Abrasives	Neutron Industries Inc.	cleaner	800-421-7619	11/01/85
1700	Dry Spice	Aerosol Air Freshner	Neutron Industries Inc.	Air Freshner	800-421-8481	04/01/88
1701	Flush and Clean Urinal Blocks	Formulated Deodorant	Neutron Industries Inc.	Deodorant bar	602-867-8010	03/01/87
1702	Citrus Power	Formulated Cleaner Degreaser	Neutron Industries Inc.	Cleaner/Degreaser	602-867-8010	05/01/88
1703	Mint Action NI-750	Formulated toilet cleaner	Neutron Industries Inc.	Toilet Cleaner	216-861-7114	11/01/85
1704	Naturally Peach	Formulated deodorant	Neutron Industries Inc.	Air Freshner	261-861-7114	04/01/89
1705	Smooth Move NI-790	Multi Purpose Silicone Lubrica	Neutron Industries Inc.	Lubricant	800-421-8481	11/01/85
1706	Resolve Aerosol	Formulate Solvent Degreaser	Neutron Industries Inc.	Degreaser	800-421-8481	06/01/86
1707	Naturally Peach	Deoderant Air Freshner	Neutron Industries Inc.	Air Freshner	800-421-8481	04/01/89
1708	NI-712 Orange and Strawberry	Formulated Odor Eliminator	Neutron Industries Inc.	Odor eliminator	800-421-8481	10/01/87

1709	Spinkle Fresh	White Crystalline solid	Neutron Industries Inc.	Deodorizor	602-867-8010	06/01/86
1710	Wet Look	Formulated Floor Finish	Neutron Industries Inc.	Floor Finish	216-861-7114	11/01/85
1711	Touch of Spice	Formulated room deodorizer	Neutron Industries Inc.	Deodorizer	800-421-8481	01/01/87
1712	Sudden Impact Aerosol	Residual affect insecticide	Neutron Industries Inc.	insecticide	800-421-8481	02/01/87
1713	Versatile	Formulated Bathroom Cleaner	Neutron Industries Inc.	Bathroom Cleaner	216-861-7114	11/01/85
1714	Graffiti Gone NI-722	Aerosol Graffitti remover	Neutron Industries Ind.	Graffiti remover	800-421-8481	10/01/85
1715	Cemented T.C./High-Speed Steel	Tungsten Carbide	New York Twist Drill	Abrasive	516/588-8800	06/01/89
1716	CementedCarbide mixed w/cobalt	Tungsten carbide 65-97%	Newcomer	Abrasive	412/537-5531	01/01/88
1717	Ceramic Inserts	Aluminum Oxide 50-76%	Newcomer	Abrasive	412/537-5531	03/01/88
1718	Carbide grades Cobalt Binder	Cemented Carbide	Newcomer Products Inc.	Abrasive	412-537-5531	01/01/89
1719	Cemented Carbide	Refactory Metal Carbide	Newcomer Products Inc.	Cutting Tool	412-537-5531	01/01/88
1720	Aromatic Ammonia Inhalant	Ammonia 15%, Ethyl Alcohol 35%	Newton	Inhalant	201/383-2332	08/24/87
1721	Secta Sooth I.B. and S.R. Swab	Triethanolamine 35%,I.Alc21.3%	Newton	Medical	201/383-2332	/ /
1722	Cutter Carbide Grade	Refractory Metal Carbide	Niagara Cutter Inc.	Cutting tool	716-693-8400	11/01/85
1723	Milling Cutters and End Cutter	Ferrous Alloy	Niagara Cutter Inc.	Cutting and Milling	716-693-8400	11/01/85
1724	Compressed Sheet Packing	Asbestos, chrysotile w/ rubber	Nicolet	Insulation	215/646-4000	05/12/86
1725	Nissen Metal Marker: Yellow	N/A	Nissen	Paint	215/886-2025	11/25/85
1726	Nissen Bleach Proof: Black	Xylene 49%	Nissen	Paint	215/886-2025	11/25/85
1727	Nissen Metal Marker: White	N/A	Nissen	Paint	215/886-2025	11/25/85
1728	Ficam Plus Synerg. Pyrethrins	Bendiocarb 29.5%	Nor-Am		302/575-2000	05/24/85
1729	Paco Super Plastic (Ram/Block)	N/A	North State	Insulation	919/299-1441	/ /
1730	Paco 80 Ram (Plastic)	Aluminum Silicates	North State	Ceramic, plastic	919/299-1441	07/29/01
1731	Paco Plastic (Ram or Block)	Aluminum Silicates	North State	Ceramic, plastic	919/299-1441	07/29/01
1732	Bolt Anchor Cement		Northern Indus.	Cement	800/831-7100	11/15/85
1733	120 Plastic Mortar Resin	Epichlorohydrin	Northern Indus.	Resin, epoxy	800/831-7100	/ /
1734	120 H	Aliphatic Amine	Northern Indus.	Curing Agent, epoxy	800/831-7100	/ /
1735	Plastic Mortar Acid Resistant	Epoxy Resin	Northern Indus.	Resin, epoxy	800/831-7100	11/15/85
1736	Plastic Mortar Acid Resistant	Epoxy Curing Agent	Northern Indus.	Curing Agent, epoxy	800/831-7100	11/15/85
1737	Austenitic Stainless Steels	302...Avesta 254-SMO	Northern Precision Casting	Alloy	414/248-4461	04/24/90
1738	Grinding Wheel	Resinoid Bonded	Norton	Abrasive	508/795-2690	01/23/89
1739	Grinding Wheel	Diamond/CBN	Norton	Abrasive	508/795-2690	04/17/90
1740	Grinding Wheel: FFX..X-HARD	Resinoid Bonded	Norton	Abrasive	508/795-2690	04/17/90
1741	Grinding Wheel	Rubber/Shellac Bonded	Norton	Abrasive	508/795-2690	04/17/90
1742	Grinding Wheel: Any Grade	Resinoid Bonded	Norton	Abrasive	508/795-2690	04/30/90
1743	Vitrified Bonded	N/A	Norton	Abrasive	508/795-2690	12/16/88
1744	Vitrified Bonded-Abrasive Prod	Alpha-Alumina/Silicon Carbide	Norton	Abrasive	508/795-2690	04/17/90
1745	Norton Sharpening Stone Oil	Refined Liquid Hydrocarbons	Norton Pike Division	Oil	603-444-3947	09/15/85
1746	Anderol Grease 786 Syn Extreme	Esters	Nuodex	Lubricant	201/763-7173	12/20/85
1747	Extruded PTFE Rods	Polytetrafluoroethylene (PTFE)	Oak Materials		518/686-7301	04/23/86
1748	Oakite Rustripper	Sodium Hydroxide	Oakite	Cleaner, metal	201/464-6900	02/07/86
1749	Oakite Draw Clean M	Solvent-Soap based Lubricant	Oakite	Lubricant	201/464-6900	01/29/86
1750	Oakite 33	Phosphoric Acid	Oakite	Acid	201/464-6900	05/01/87
1751	Oakite Carbaway	Methylene Chloride	Oakite		201/464-6900	05/15/87
1752	Chromic Acid-Flake	Chromium Trioxide	Occidental Chemical Corp.	Plating	800-752-5151	10/23/89
1753	Chromic Acid Flake	Chromium Trioxide	Occidental Chemical Corp.	Plating	716-278-7021	10/23/89

1754	2620000 Electrostatic Dispersa	Petroleum Hydrocarbons	Oce'	Solvent	312/338-1700	07/01/86
1755	356 Alloy	Aluminum 6.5% Silicon Alloy	Ohio	Alloy (casting)	216/641-8865	04/01/88
1756	355 Alloy	Alum4.5%Sili1%CoppCastingAlloy	Ohio	Alloy (casting)	216/641-8865	04/01/88
1757	Floor Absorbent	Fullers Earth	Oil-DRI Corporation of Amer.	Floor Absorbent	312-321-1515	05/16/90
1758	Chlorine	N/A	Olin	Gas	203/356-3449	10/19/82
1759	Caustic Soda Solution	Sodium Hydroxide 45-50%	Olin	Neutralizing Agent	203/356-3449	01/02/90
1760	Hi Speed Circuit Etch	Ferric Chloride	Olin	Etchant, circuit	203/356-3449	01/03/89
1761	Hunt Premium Star 20 Developer	Steel Powder	Olin	Developer	203/356-3449	06/28/85
1762	Hydrofluoric Acid	N/A	Olin	Acid	203/356-3449	10/01/71
1763	Sulfuric Acid	Sulfuric Acid	Olin	Plating (acid)	203-754-2171	01/02/90
1764	Sulfuric Acid ACS	Sulfuric Acid 95%-98%	Olin	Acid	203/356-3449	02/18/88
1765	Vu-Tek Cleaner	De-natured Isopropyl Alcohol	Optical Devices	Cleaner	805/987-8801	12/16/87
1766	Valumed Irrigating Eye Wash	Sodium Chloride .44%	Optopics Labs	Medical	609/451-9350	01/02/90
1767	Titanium	N/A	Oregon	Alloy	503/926-4281	11/01/85
1768	Muriatic Acid 20 Hooker White	Hydrochloric Acid	Oxychem	Corrosive	716-278-7021	05/03/88
1769	AMS5355/17-4PH	Steel	PCC	Alloy	216/868-7153	10/12/87
1770	M3629/C103DS	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1771	M3602/IN713LC	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1772	M3610/IN713LC	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1773	M-3504/L605	Steel, cobalt	PCC	Alloy	216/868-7153	10/12/87
1774	M36BM-1/CX102	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1775	M3617/C101	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1776	M3621/C103EQ	Steel, nickel	PCC	Alloy	216/868-7153	10/12/87
1777	Antifreeze Formulation 701	Ethylene Glycol	PPG	Antifreeze	304/883-1300	/ /
1778		1,1,1-Trichloroethane	PPG		304/843-1300	11/01/85
1779	Ethylene Glycol	N/A	PPG	Glycol	304/843-1300	10/01/83
1780	Ethylene Glycol,1,2-Ethanediol	N/A	PPG	Glycol	304/843-1300	03/01/77
1781	Hub-Thane	1,1,1-Trichloroethane	PPG		304/843-1300	07/01/87
1782	Prist Aviation Fuel Additive	Ethylene Glycol Monomethyl Eth	PPG	Ether, glycol	304/843-1300	08/01/82
1783	Prist 205 Lo-Flo	Ethylene Glycol Monomethyl Eth	PPG	Fuel additive	304/843-1300	01/20/87
1784	Sodium Hydroxide	N/A	PPG	Alkali	304/843-1300	10/30/87
1785	Tri-Ethane	1,1,1-Trichloroethane(stabl.)	PPG		304/843-1300	04/01/82
1786	Tri-Ethane 377	1,1,1-Trichlor >95%	PPG		304/843-1300	08/09/89
1787	Tri-Ethane (R) 377	Halogenated Hydrocarbon	PPG Industries Inc.	Solvent	304-843-1300	08/09/89
1788	P-10 Black Marker Ink Formula	Xylene	Pacific	Ink	800/643-3500	/ /
1789		N/A	Panasonic		312/981-4820	01/04/88
1790	Closed die forged product	Steel or titanium billet	Park-Ohio	Machining, grinding	216/431-2900	/ /
1791	Bonderite D-180 Replenishing	Phosphate(total),phosphor.acid	Parker	Coating	517/263-9430	03/04/83
1792	Accelerator 131	Sodium Nitrite	Parker	Urethane	517/263-9430	05/21/86
1793	Bonderite D-180 Makeup	Zinc Dihydrogen Phosphate	Parker	Rust Preventative	517/263-9430	09/26/88
1794	Accelerator 130	Sodium Nitrite	Parker	Urethane	517/263-9430	05/21/86
1795	Flexwhite Products	Silicon Dioxide, Calcium Oxide	Partek	Insulation	519/336-7770	/ /
1796	Hilblok	Silicon Dioxide, Calcium Oxide	Partek	Insulation	519/336-7770	/ /
1797	Hilboard Products	Silicon Dioxide, Calcium Oxide	Partek	Insulation	519/336-7770	/ /
1798	Aluminum Casting	N/A	Peerless	Casting	203/366-4761	03/19/86

1799	Natural/Synthetic rubber-bond	N/A	Pekay	Abrasive	201/239-4600	08/25/86
1800		Zinc Dust-bal.,Paraf Disti 36%	Pena-Penetrox		603/647-5000	06/11/90
1801	Slix	N/A	Penetone	Cleaner	201/567-3000	/ /
1802	Penetone (was Westeam HD-210)	Chelating Agent,SodiumHydroxid	Penetone	Cleaner, metal	201/567-3000	03/01/84
1803	TPC Solvent	Petroleum Hydrocarbons,isopara	Penetone	Cleaner, solvent	201/567-3000	04/01/87
1804	Platen Cleaner Pak	N/A	Penner	Cleaner	215/598-3000	04/01/87
1805	Airbrasive Powder No. 10	Silicon Dioxide	Pennwalt	Glass, crushed	201/752-8300	10/23/86
1806	Airbrasive Powder No. 4	Sodium Bicarbonate	Pennwalt		201/752-8300	10/23/86
1807	Airbrasive Powder No. 8	Silicon Carbide	Pennwalt		201/752-8300	10/23/86
1808	Airbrasive Powder No. 3	Aluminum Oxide	Pennwalt	Oxide	201/752-8300	10/23/86
1809	Airbrasive Powder No. 1	Aluminum Oxide	Pennwalt	Oxide	201/752-8300	10/23/86
1810	Airbrasive Powder No. 1M	Aluminum Oxide	Pennwalt	Oxide	201/752-8300	10/23/86
1811	Airbrasive Powder No. 5	Aluminum Oxide	Pennwalt	Oxide	201/752-8300	10/23/86
1812	Airbrasive Powder No. 11	Aluminum Oxide	Pennwalt	Oxide	201/752-8300	10/23/86
1813	HD Motor Oil SAE 10W-40	Oils, base lubricating 75-85%	Pennzoil	Lubricant	713/236-6070	03/16/89
1814	Lead Acid/Gelled	Electric Storage Battery	Penta Battery	Battery	203-573-8641	11/05/87
1815	Perfectduster	Dichlorodifluoromethane	Perfectdata	Cleaner	805/581-4000	05/18/88
1816	Permatex Avia Form-A-Gasket 3	Resins, modified natural	Permatex	Gasket	203/527-5211	10/01/85
1817	Silicone Form-A-Gask Adh Sea B	Poly (dimethylsiloxane)	Permatex	Adhesive	203/278-1280	01/01/89
1818	Dressers Core Drills, Reamers	Metal Bonded	Permattach Diamond Tool Corp.	Dressers	603-673-2904	05/01/87
1819	Petrolane Propane	Propane	Petrolane	Gas	213/427-5471	04/01/86
1820	LP-Gas, LPG	Liquefied Petrol Gas (Propane)	Petrolane, e.g.	Gas		09/01/85
1821	High Speed Steel Cutting Tools	N/A	Pfauter-Maag	Abrasive	815/877-8900	12/21/89
1822	Aluminum Sand Casting	Aluminum Alloy: 356	Phillips	Alloy (casting)	607/723-6483	/ /
1823	Aluminum Alloys	Aluminum (not lithium+nickel)	Pimalco	Alloy	602/961-1098	10/15/85
1824	184-0 Black Developer	Iron Powder 89-94%	Pitney Bowes	Ink	203/356-5000	04/01/89
1825	188-0 Photoreceptor Drum	Coated on an Al Drum 99.2%	Pitney Bowes		203/356-5000	04/01/89
1826	Blue D230 Printpowder (290-2)	Styrene Acrylic Polymer 95%	Pitney Bowes	Ink	203/356-5000	01/01/87
1827	Black Toner 180-0 Printpowder	Styrene Acrylate Copolymer 86%	Pitney Bowes		203/356-5000	04/01/89
1828	Developer 774,874	Ferrite Powder 96-98%	Pitney Bowes	Ink	203/356-5000	01/01/87
1829	Green D230 Printpowder (290-1)	Styrene Acrylic Polymer 95%	Pitney Bowes	Ink	203/356-5000	01/01/87
1830	Red D230 Printpowder (290-3)	Styrene Acrylic Polymer 95%	Pitney Bowes	Ink	203/356-5000	01/01/87
1831	Silicone Oil	Poly Dimethyl Siloxane	Pitney Bowes	Lubricant	203/356-5000	01/01/87
1832	Photoreceptor Drum 344,544,744	As Alloy on Al Drum(60Se,40As)	Pitney Bowes		203/356-5000	01/01/87
1833	PhotoreceptDrum144,644,844,944	Selenium 90%	Pitney Bowes		203/356-5000	01/01/87
1834	Pitney Bowes Printpowder 290	Styrene Acrylic Resin 85%	Pitney Bowes	Ink	203/356-5000	01/01/87
1835	Toner Black 370,570-870,980 Pr	Inert Resins 85%	Pitney Bowes	Ink	203/356-5000	09/01/89
1836	Pitney Bowes 850 Printpowder	Styrene/acrylate copolymer	Pitney Bowes	Copy Machines	203-356-5000	04/01/87
1837	Toners/Developers 250-494		Pitney Bowes	Copy Machines	203-356-5000	01/01/87
1838	Silicone Oil		Pitney Bowes	Copy Machines	203-356-5000	01/01/87
1839	Drum Setting Powder		Pitney Bowes	Copy Machines	203-356-5000	01/01/87
1840	Master Cartridge L Machines	120/170	Pitney Bowes	Copy Macines	203-356-5000	04/01/87
1841	Forgings from billets & bars	Steel, leaded alloy	Pittsburgh	Alloy	412/264-4000	11/12/85
1842	Forgings from billets & bars	Steel, alloy	Pittsburgh	Alloy	412/264-4000	11/12/85
1843	Forgings from billets & bars	Steel, carbon	Pittsburgh	Alloy	412/264-4000	11/12/85

1844	Forgings from plate	Steel, alloy	Pittsburgh	Alloy	412/264-4000	11/12/85
1845	Forgings from plate	Steel, carbon	Pittsburgh	Alloy	412/264-4000	11/12/85
1846	Forgings from Nickel base allo	Steel	Pittsburgh	Alloy	412/264-4000	11/12/85
1847	Forgings from billets & bars	Steel, leaded carbon	Pittsburgh	Alloy	412/264-4000	11/12/85
1848	Tool Steels	Steel	Pittsburgh	Metal	412/264-4000	11/12/85
1849	Stainless Steel Forgings	Steel, stainless	Pittsburgh	Alloy	412/264-4000	11/12/85
1850	Zinc Strip	Zinc, high grade	Platt	Alloy	203/753-4194	/ /
1851	Poco Graphite EDM-1	Graphite	Poco Graphite		817/627-2121	09/01/82
1852	TDT 178-34 Hardener	Polyol	Polyurethane	Polyurethane	517-351-5900	12/09/88
1853	219 x 16-A1	Friction Modifier	Porter	Insulation	219/356-2410	11/25/85
1854	Thermoid 2643-XX	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1855	Thermoid D-530-A	Asbestos Fiber	Porter	Insulation	219/356-2410	/ /
1856	Thermoid D-556	Asbestos Fiber	Porter	Insulation	219/356-2410	/ /
1857	Thermoid 796	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1858	Thermoid 8562 Friction Materia	Friction Mod 35%,Glass/PMF 43%	Porter	Insulation	219/356-2410	/ /
1859	Thermoid 3384	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1860	Thermoid D-788-A	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1861	Thermoid 3M-211-C	Asbestos Fiber	Porter	Insulation	219/356-2410	/ /
1862	Thermoid 3271	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1863	Thermoid D-575-A	Asbestos Fiber	Porter	Insulation	219/356-2410	11/25/85
1864	Thermoid D-596-A	Asbestos Fiber	Porter	Insulation	219/356-2410	/ /
1865	1432 GlassPac Cleaner	Isopropanol Alcohol	PortionPac Chemical Corp.	Cleaner	312-226-0400	05/03/88
1866	NeutraPac4 404	Mixture	PortionPac Chemical Corp.	Detergent	312-226-0400	05/23/88
1867	MI StripPac 314	Ethanol	PortionPac Chemical Corp.	Detergent	312-226-0400	05/03/88
1868	Germicidal Detergent 204	Ethanolamine	PortionPac Chemical Corp.	Germicidal Detergent	312-226-0400	05/12/88
1869	RestorePac 2102	Methyl Carbitol	PortionPac Chemical Corp.	Floor Finish	312-226-0400	09/25/88
1870	Nickel Base Self Fus/Braz Powd	N/A	Powder Alloy	Alloy	513/984-4016	01/01/86
1871	Nickel Base Self Fusing Powder	Metal Powder	Powder Alloy Corporation	Metal Powder	513-984-4016	01/01/86
1872	Brass Alloy 260	Copper, Zinc	Precision Brand	Alloy	312/969-7200	01/10/86
1873	Cold Rolled Carbon Steel	Steel	Precision Brand	Alloy	312/969-7200	01/15/86
1874	Music Wire-ASW	N/A	Precision Brand		312/969-7200	/ /
1875	Tool Black	N/A	Precision Brand	Acid	312/969-7200	10/31/85
1876	Stainless Steel	N/A	Precision Brand	Alloy	312/969-7200	/ /
1877	Tool/Specialty Strip Steels	N/A	Precision Brand	Alloy	312/969-7200	11/15/85
1878	Alloy Cast-Ni,Ni/Fe,Co,Ti Base	N/A	Precision Castparts	Alloy	503/777-3881	10/06/88
1879	Diamond Lapping Compound	Petroleum Base	Precision Diamond	Abrasive	312/888-7100	/ /
1880	Cutting Tool	N/A	Precision Diamond	Abrasive-Metal	312/888-7100	11/24/85
1881	Dressing Tool	N/A	Precision Diamond	Abrasive-Steel	312/888-7100	11/24/85
1882	Grinding Wheel	Diamond/CBN Metal/Vitrified Bo	Precision Diamond	Abrasive	312/888-7100	11/24/85
1883	Grinding Wheel	Diamond/CBN Resin Bond	Precision Diamond	Abrasive	312/888-7100	11/24/85
1884	Nickel Plated Superabrasive	Electroplated Nickel	Precision Diamond	Abrasive	312/888-7100	11/24/85
1885	Primary Steel (Fe Base Alloys)	N/A	Precision Rolled Products	Alloy	702/972-0272	11/19/85
1886	Primary Steel (Ti/Ti Alloys)	Al,Mo,Pb,Ti,V,Zr	Precision Rolled Products	Alloy	702/972-0272	11/19/85
1887	Primary Steel (Ni Base Alloys)	N/A	Precision Rolled Products	Alloy	702/972-0272	11/19/85
1888	High Speed Steel Drill Bit	Steel	Precision Twist Drill	Drill Bit	815-459-2040	11/28/88

1889	Tool Steel W-1...S-7	Steel, tool	Precision-Kidd	Alloy	412/222-2100	04/01/86
1890	Titanium	N/A	President	Alloy	617/294-0991	11/25/85
1891	Primex III	Oils, soybean+palm	Procter & Gamble		800/543-4252	06/01/86
1892	Time-Out	Monoethanolamine, Na Metasilic	Purex	Cleaner	213/634-3300	/ /
1893	Beacon Ammonia	Ammonia Solution, anhydrous	Q-Pak		201/483-4404	08/01/85
1894	Additive CD #2	Sassafrass Scent	Quaker	Odorant Perfume	215/828-4250	05/15/84
1895	Draw 289	N/A	Quaker		215/828-4250	07/23/90
1896	Kut 170-TL Base	N/A	Quaker		215/828-4250	07/23/90
1897	Kut 45	N/A	Quaker		215/828-4250	07/23/90
1898	Quaker 625-QL	Sodium Hydroxide	Quaker	Cleaner, metal	215/828-4250	08/04/83
1899	Ferrocote 5856XHF	Complex Mixture	Quaker Chemical Corp.	Metalworking Fluid	215-828-4250	08/12/86
1900	Ferrocote 112	Complex Mixtrue	Quaker Chemical Corp.	Metalworking Fluid	215-828-4250	06/09/88
1901	Ferrocote 112DM	Hydrotreated Light Naphthenic	Quaker Chemical Corp.	Metalworking Fluid	215-828-4250	11/15/89
1902	Ferrocote 5856XHF-K-1	Solvent	Quaker Chemical Corp.	Solvent	215-828-4250	06/26/80
1903	Ferrocote 366	Complex Mixture	Quaker Chemical Corp.	Metalworking Fluid	2150828-4250	08/11/86
1904	Lytex 9063	N/A	Quantum	Epoxy Molding Compou	517/496-2884	05/30/90
1905	High Speed Steel	Ferrous Alloy	Quinco Tool Products Co. Inc.	stock	313-353-1340	01/31/86
1906	Mold Release 225	Mold Release	RAM	Mold Release	213/321-0710	11/20/85
1907	Copper Alloy C93200	N/A	RBI	Alloy	419/223-1075	/ /
1908	Pro Fuse	Leveling Fusing Fluid	RBP Chemical Corporation		414-258-0911	05/02/88
1909	REM SP-1388	Sodium Hydroxide 50%	REM		203/621-6755	06/05/90
1910	A-56	Asbestos, chrysotile	RM	Insulation	803/744-6261	02/13/86
1911	Titanium, etc.: 22 MSDS	N/A	RMI	Alloy	216/544-7655	02/12/90
1912	Racon 22	Chlorodifluoromethane	Racon	Gas	316/524-3245	04/07/89
1913	Resin Bonded Abrasive Products	N/A	Radiac	Abrasive	618/548-4200	03/01/89
1914	Vitrified Bonded Abrasive Prod	N/A	Radiac	Abrasive	618/548-4200	03/01/89
1915	Liquid Wrench No.1 Non Aerosol	Petroleum Solvent	Radiator	Penetrant,liquid	704/377-6555	09/01/85
1916	Liquid Wrench No.1 Oil	Petroleum Solvent	Radiator	Penetrant,liquid	704/377-6555	09/01/85
1917	Ramco Cements	Calcium, Aluminum	Ramco	Cement	417/781-6660	/ /
1918	AMS 3125 E-2023: 16081 (Gray)	Alkyd Resin Sol'n, Miner Spiri	Randolph	Gloss Bake Engine En	201/438-3700	01/01/89
1919	Lusterle Bake Enam TT-E-527	Mineral Spirits,Mag-Sili. Hydr	Randolph	Paint Product	201/438-3700	08/14/86
1920	Lusterle Insig Wh MIL-E-5556	Aliphatic Hydrocarbon, pigment	Randolph	Paint Product	201/438-3700	05/10/82
1921	Zinc Chromate Primer TT-P-1757	Alkyd Resin Sol.,Zinc Chromate	Randolph	Paint Product	201/438-3700	03/01/89
1922	TT-E-489G Cla.A Comp G&L-16473	Alkyd Resin Solution	Randolph	Gloss A/D Enamel	201/438-3700	02/01/89
1923	TT-T-291 Petroleum Spirits	Mineral Spirits	Randolph	Paint Product	201/438-3700	09/01/88
1924	TT-T-306C Type 1	Xylene, mineral spirits	Randolph	Paint Product	201/438-3700	06/27/89
1925	Zirconium Powder	Zirconium Silicate	Ransom & Randolph		419/893-9497	11/01/85
1926	Thermofit S-1009 Adhesive	N/A	Raychem	Adhesive	415/361-3333	07/01/86
1927	R4893-1 & 4893-4	Inert carbon,phenolic polymer	Raymark	Insulation	203/371-0101	12/08/81
1928	1488	Asbestos, chrysotile	Raymark I.D.	Insulation	717/665-2211	10/15/80
1929	969X	Asbestos,lead,phenolic resin	Raymark I.D.	Insulation	717/665-2211	10/15/80
1930	Pyrotex US9517	Asbestos, chrysotile	Raymark I.D.	Insulation	717/665-2211	07/24/85
1931	RM 500B	Phenolic polymer,asbest.(chry)	Raymark I.D.	Insulation	717/665-2211	07/08/82
1932	S-860-0 & S-860-10	Asbestos, chrysotile	Raymark I.D.	Insulation	717/665-2211	12/15/80
1933	44 Aluminum-56 Chromium Powder	Master Alloy	Reading	Alloy	215/693-5822	11/25/85

1934	50 Aluminum-50 Vanadium	Master Alloy	Reading	Alloy	215/693-5822	11/25/85
1935	45 Aluminum-55 Molyb-Titanium	Master Alloy	Reading	Alloy	215/693-5822	11/25/85
1936	35 Aluminum-65 Vanadium	Aluminum, vanadium	Reading	Alloy	215/693-5822	11/25/85
1937	Master Alloy	45 Aluminum 55 Molybdenum	Reading	Alloy	215/693-5822	11/25/85
1938	Hydrochloric Acid	N/A	Reagent	Acid	800/231-1807	07/01/86
1939	Grinding Wheel	Resin Bonded	Red Hill	Abrasive	215/679-7964	11/18/85
1940	Cem T.C./High-Speed Steel Cutt	Steel,tungsten carbide	Regal-Beloit	Metal Removal	815/389-1920	03/01/87
1941	High Speed Cutting Tools	Cemented Tungsten Carbide	Regal-Beloit	Cutting Tool	815-389-3461	06/01/89
1942	Aluminum Hydroxide Gel	Aluminum Hydroxide	Reheis Chemical Company		201-464-1500	08/04/86
1943	Avco 34-40	Petroleum Solvent,naphthen. PD	Reilly-Whiteman		215/828-3800	12/05/89
1944	Electroplating Silver Anodes	Silver Anodes	Reliable Corperation		203-574-4963	07/09/86
1945	Flexidyne Flow Charge	Steel, cast	Reliance	Alloy	803/297-4800	05/09/86
1946	SP4824-3RA Blue Green	Methylene Chloride,Xylol	Reliance	Coating	803/297-4800	12/04/01
1947	250-30E27-0877	N/A	Reliance Universal	LT Gray TU for824-77	312/872-1000	11/26/85
1948	Brush Mix	Phosphate Bonded Alumina	Resco	Inorganic oxide/acid	215/279-5010	/ /
1949	RP Super Filter Coat 411	Water 55%,Solub Hydro Oil 44%	Research Products		608/257-8801	01/01/90
1950	FFX..X-Hard---Type 1..Slabs	N/A	Rex-Cut		508/678-1985	03/25/88
1951	Rex Cut Grinding Wheels	mixture	Rex-Cut Products Inc.	Abrasive	508-678-1985	06/25/88
1952	Aluminum Alloy	6XXX Series Alloys	Reynolds Metals	Alloy	804/281-2709	01/25/85
1953	Cast Aluminum Alloy	Aluminum	Reynolds Metals Company	Metal Alloy	804-281-2265	01/17/89
1954	Acryloid B-7 MEK Resin	MEK	Rohm & Haas	Solvent-Solution co	215/592-3000	11/28/88
1955	Kathon 886 MW Biocide	Water56.5-64.1,MgNitrate14-18	Rohm & Haas		215/592-3000	08/21/85
1956	Formula 5004	Aromatic Petroleum Solvents	Rominda	Cleaner/Degreaser	516/887-3363	/ /
1957	Formula 23-Y	Aromatic Petroleum Solvents	Rominda	Degreaser	516/887-3363	/ /
1958	Ross Black Wax 1375	N/A	Ross		201/433-4512	11/01/89
1959	Roto-Brite L-980	N/A	Roto-Finish		616/327-7071	12/11/85
1960	Roto-Brite L-638	N/A	Roto-Finish		616/327-7071	12/11/85
1961	Roto-Brite L-620	N/A	Roto-Finish		616/327-7071	12/11/85
1962	1-Bromonaphthalene	N/A	Roy		716/338-8000	08/29/85
1963	Royco 315	Hydrocarbons	Royal	Lubricant	201/887-7410	09/29/86
1964	Royco 751,770 MIL-H-46170	Synthetic Hydrocarbon	Royal	Lubricant	201/887-7410	/ /
1965	Royco 481C	Petroleum Hydrocarbon,	Royal	Lubricant oil	201/887-7410	08/31/88
1966	Royco 808	Synthetic Lubricating Oil	Royal	Lubricant	201/887-7410	11/01/85
1967	Royco 782,782-2,782-3	Synthetic Hydrocarbon	Royal	Lubricant	201/887-7410	11/01/85
1968	Royco 783D	Naphthenic Distillate,hydrotre	Royal	Lubricant	201/887-7410	11/01/85
1969	Royal Treatment	Hydrocarbon	Royal Chem.	Acrylic Floor Finish	212/456-9666	/ /
1970	Rust-Lick 631	Naphthenic Distillate 60-70%	Rust-Lick	Lubricant	203/792-0052	/ /
1971	Aluminum	Aluminum Alloy	Ryerson	Alloy	312/762-2121	11/08/85
1972	Nickel	Nickel Alloys	Ryerson	Alloy	312/762-2121	11/08/85
1973	Steel	N/A	Ryerson	Alloy	312/762-2121	/ /
1974	Lemon Shine-up	mixture-water hydrocarbon solv	S.C. Johnson Wax	Spray Wax	414-631-2777	06/29/90
1975	BL-15 Cell Fluid	Petroleum Hydrocarbons 99%	SATEC	Lubricant	412/458-9610	05/28/87
1976	Alloy Steel remelt Forgings	Steel, alloy	SIFCO	Alloy	216/881-8600	05/22/86
1977	Beryllium Copper Wrought Alloy	Beryllium Copper	SIFCO	Alloy (plating)	216/881-8600	05/22/86
1978	Aluminum Alloys	1XXX-7XXX: Leaded 2011 & 6062	SIFCO	Alloy (plating)	216/881-8600	05/22/86

1979	Gold Acid Plating Solution	Ethylenediamine-aurocyanide co	SIFCO	Salt	216/881-8600	02/17/89
1980	Nickel Based Alloy Forgings	Steel, nickel	SIFCO	Alloy	216/881-8600	05/22/86
1981	Titanium Forgings	Titanium	SIFCO	Alloy	216/881-8600	05/22/86
1982	Stainless Steel Forgings	Steel, stainless	SIFCO	Alloy	216/881-8600	05/22/86
1983	Steel Forgings	Steel	SIFCO	Alloy	216/881-8600	05/22/86
1984	Gold Alkaline Plating Solution	Soluble Cyanides	SIFCO Selective Plating	Plating	216-881-8600	02/23/89
1985	Nickel Plating Solution	Chelate Nickel Sulfate	SIFCO Selective Plating	Plating	216-881-8600	04/17/90
1986	Safetap	Metalworking fluid	SafeTec	Fluid, metalworking	804/355-1111	01/08/86
1987	Cem T.C. Grade E02,CT515,CT520	Carbide mixed w/cobalt+nickel	Sandvik Coromant	Metal Removal	201/794-5000	11/25/85
1988	CC670	Silicon Carbide, Reinforced Al	Sandvik Coromant Company	Ceramic Composite	201-797-5000	06/01/87
1989	Cemented Tungsten Carbide	Refractory Metal Carbide	Sandvik Coromant Company	Carbide producte	210-797-5000	06/01/87
1990	Nickel Cadmium Battery-Cadnica	Cadmium Hydroxide 11-26%	Sanyo		201/641-2333	07/13/90
1991	FBX 850 Board	Mineral Oil,hydrocarbon	Sargent-Welch	Lubricant	312/677-0600	11/05/85
1992	Savol Ammonia	Ammonia Solution, anhydrous	Savol	Bleach	203/282-0878	/ /
1993	200-AF...1186-AF	N/A	Scan-Pac	Insulation	414/241-3890	04/28/86
1994	RF-12...425		Scan-Pac		414/241-3890	02/03/86
1995	Precision Cut and Ground Gears	N/A	Schwartz	Abrasive	313/754-4600	07/20/90
1996	Molbdenum Alloy TZM	Molybdenum	Schwarzkopf	Alloy	617/429-6801	11/01/84
1997	Air, compressed gas in cylinde	Atmospheric Gas	Scott	Gas	215/766-8861	/ /
1998	Carbon Monoxide	N/A	Scott	Gas	215/766-8861	03/25/87
1999	Helium	N/A	Scott	Gas	215/766-8861	/ /
2000	Hydrogen	N/A	Scott	Gas	215/766-8861	/ /
2001	Nitrogen	Nitrogen	Scott	Gas	215/766-8861	/ /
2002	Carbon Dioxide in Nitrogen	Acid gas mixture	Scott Specialty Gases		215-766-8861	/ /
2003	Propane in Nitrogen	Hydrocarbon in Gas Mixture	Scott Specialty Gases		215-766-8861	/ /
2004	Nitric Oxide in Nitrogen	Acid in gas mixture	Scott Specialty Gases		215-766-8861	/ /
2005	Instapak Comp. A	4,4'MDI 50%	Sealed Air		203/791-3500	02/01/89
2006	Instapak Gun Solvent	Glycol Ethers	Sealed Air	Solvent, gun	203/792-2360	11/01/85
2007	Instapak Holster Solvent	Tripropylene Glycol Methyl Eth	Sealed Air	Solvent, holster	203/791-3500	07/01/88
2008	Instapak Port Cleaner	Gamma-Butyrolactone 97%	Sealed Air	Cleaner	203/791-3500	01/01/90
2009	Instapak-200 [Q.S.] Comp. B	Trichloromonofluoromethane 20%	Sealed Air		203/791-3500	03/01/89
2010	Instapak-40W Comp. B	Glycerin (mist) 7%	Sealed Air		203/791-3500	05/01/90
2011	Milflex Comp. A	4,4'MDI ~41%	Sealed Air	Isocyanate	203/791-3500	10/01/89
2012	Milflex Comp. B	N/A	Sealed Air	Polyol	203/791-3500	08/01/89
2013	Instapak-40 Component "B"	Trichloromonofluoromethane	Sealed Air	Urethane resin	203/792-2360	05/01/87
2014	Holster/Instapacker Solvent	Tripropylene Glycol Methyl Eth	Sealed Air	Lubricant	203/791-3500	03/01/89
2015	Instapak Rigid Component B	Polyurethane Resin	Sealed Air Corporation	Foam	203-791-3500	11/01/90
2016	Semstone 805 Part B	Butyl Glycidyl Ether	Sentry	Coating	409/233-0312	12/14/89
2017	Semstone 110 Primer Part B	Epoxy Curing Agent	Sentry	Primer	409/233-0312	05/15/89
2018	Semstone 110 Primer Part A	Epoxy Resin	Sentry	Primer	409/233-0312	05/15/89
2019	Semstone 805 Part A	Nonylphenol	Sentry	Coating	409/233-0312	12/14/89
2020	Semstone 850 Part B	Flexible Hybrid-Putty Grade	Sentry	Adhesive	409/233-0312	12/14/89
2021	Semstone 850 Part A	Flexible Hybrid-Putty Grade	Sentry	Adhesive	409/233-0312	12/14/89
2022	Calibr Fluid MIL-C-7024C Type2	Solvent Naphtha (Petroleum)	Shell	Solvent, hydrocarbon	713/241-4819	09/23/85
2023	Acetone	N/A	Shell	Ketone	713/241-4819	06/14/90

2024	2-Ethyl Hexanol	N/A	Shell	Solvent	713/473-9461	10/01/71
2025	Aeroshell (R) Grease 16	Hydrocarbons	Shell	Lubricating Grease	713-473-9461	09/13/85
2026	Ethyl Alcohol 19, compl denatu	Ethyl Alcohol 95.2%	Shell	Alcohol	713/241-4819	11/03/88
2027	Mineral Spirits 135	Hydrocarbon Solvent	Shell	Solvent	713/473-9461	08/18/81
2028	Methyl Ethyl Ketone	N/A	Shell	Ketone	713/241-4819	07/20/89
2029	Shell Vitrea Oil 150	Paraffinic Distillate 50-55%	Shell	Lubricant	713/241-4819	08/20/85
2030	Shell Turbo T Oil 68	Petroleum Hydrocarbons Turbo	Shell	Oil, turbo	713/473-9461	05/11/87
2031	Shell Turbo T Oil 100	Petroleum Hydrocarbon	Shell	Oil, turbine	713/473-9461	08/02/82
2032	Neosol 190 Proof	Ethyl Alcohol	Shell	Solvent	713/473-9461	/ /
2033	Shell Clavus Oil 22	Naphthenic Distillate 50-55%	Shell	Lubricant	713/241-4819	11/03/88
2034	Shell Alvania Grease 2	Petroleum Hydrocarbons	Shell	Lubricant	713/473-9461	01/01/79
2035	Shell Sol 340 HT	Naphthenes 52.5%,Paraffins 47%	Shell	Solvent	713/241-4819	11/03/88
2036	Neosol Proprietary Solvent	Ethyl Alcohol	Shell	Solvent	713/473-9461	09/15/86
2037	Shell Diala Oil AX	Middle Distllate 70-100%	Shell	Lubricant	713/241-4819	09/04/89
2038	JP-4	Petroleum Hydrocarbon	Shell	Fuel	713-241-4819	07/12/89
2039	Jet A	Petroleum Hydrocarbon	Shell	Kerosene	713-241-4819	07/13/89
2040	JP-5	Petroleum Hydrocarbon	Shell	Turbine Fuel	713-241-4819	07/18/89
2041	Isopropyl Alcohol	N/A	Shell U.K.	Alcohol	030244685000	02/01/77
2042	C321: GCL Gentle Care Lotion	N/A	Shercare	Cleaner	617/295-7590	/ /
2043	C315: Shercare Scrubber	N/A	Shercare	Cleaner	617/295-7590	/ /
2044	Gental Care Lotion	Multi-Component Mixture	Shercare	Mild Detergent	617/295-7590	/ /
2045	GLC Pink	N/A	Shercare	Cleaner	617/295-7590	/ /
2046	SC-315	N/A	Shercare	Cleaner	617/295-7590	/ /
2047	Kem Lustral Enamel Lead Colors	Alkyd Enamel	Sherman-Williams Company	Paint	216-566-2902	07/25/88
2048	DS Nickel Sheet	Nickel,thoria	Sherritt Gordon	Sheet	403/998-6666	06/01/88
2049	Nickel Graphite Powder	Nickel 75%, Graphite 25%	Sherritt Gordon		403/998-6666	06/01/88
2050	KEM Lustral Enamel, Lead Color	Mineral Spirits 35-55%	Sherwin-Williams	Paint Product	216/566-2902	07/25/86
2051	Industrial Wash Primer, Green	2-Propanol,Methyl Isobu Ketone	Sherwin-Williams	Base for Wash Primer	216/566-2902	07/25/88
2052	Silver-Brite Alum Paint, R.R.	Mineral Spirits	Sherwin-Williams	Aluminum Paint	216/566-2902	01/17/89
2053	Polane Reducer,66 Redu,HS Redu	N/A	Sherwin-Williams	Reducer	216/566-2902	08/15/88
2054	Kem Lustral Enamel No Lead	Alkyd Enamel	Sherwin-Williams Company	Paint	216-566-2902	07/25/88
2055	Silver Brite Alum Paint, H.R.	Mineral Spirits	Sherwin-Wlliams	Aluminum Paint	216/566-2902	10/14/89
2056	Alloy Castings	Iron, Nickel, Cobalt Base	Sierra Cast Div.	Alloy	702/883-3800	12/18/89
2057	GI 1000A	N/A	Silicones		919/886-5018	06/29/89
2058	GI 1000B	N/A	Silicones		919/886-5018	06/29/89
2059	Bandsaws;Circular Saws/Cutters	Cobalt	Simonds	Tool, cutting	617/343-3731	01/01/86
2060	Cleaner No. 10;10LF;10RI		Sky	Cleaner	617/535-4545	10/24/86
2061	Carbon Steel: 9 MSDS	N/A	Slater	Alloy	800/348-1761	11/01/85
2062	Alloys: 800NI,600NI,N400	Steel, nickel	Slater	Alloy	800/348-1761	11/01/85
2063	Steel Alloy H-13	Steel, tool	Slater	Alloy	800/348-1761	11/01/85
2064	Stainless Steel Alloys:31 MSDS	Steel, stainless	Slater	Alloy	800/348-1761	11/01/85
2065	Fibrous Glass/Felted Servtex I	Aluminosilicate	Sohio	Insulation	716/278-2563	09/20/85
2066	Citgo All Season 10W30 Oil	Hydrocarbon	Sohio	Oil, motor	716/278-2563	04/01/86
2067	Factran EP-1	Petroleum Oil, refined	Sohio	Lubricant	216/575-8024	10/03/85
2068	Fiberfrax LDS Moldable	Aluminosilicate	Sohio	Insulation	716/278-2563	09/20/85

2069	Silicon Carbide	Carbide	Sohio		716/278-2563 11/19/85
2070	High Speed...Taps and End Mill	N/A	Sossner	Alloy	516/694-9330 11/01/83
2071	Poly Epoxy SG Parchment	2-Propoxyethanol	Southern	Parchment, epoxy	803/775-6351 01/17/87
2072	Poly Epoxy Catalyst	Aromatic Hydrocarbons	Southern	Catalyst, epoxy	803/775-6351 01/17/87
2073	Titanium 6-6-2	Ti 86%, Al 6%, V 6%, Sn 2%	Southwestern Alloys	Alloy	213/531-2152 / /
2074	Titanium 6-4	Ti 90%, Al 6%, V 4%	Southwestern Alloys	Alloy	216/652-9951 / /
2075	Titanium 5-2.5	Ti 92.5%, Al 5%, Sn 2.5%	Southwestern Alloys	Alloy	216/652-9951 / /
2076	Titanium 10-2-3	Ti 85%, V 10%, Fe 2%, Al 3%	Southwestern Alloys	Alloy	216/652-9951 11/11/85
2077	Titanium 6-2-4-6	Ti 82%,Al 6%,Sn 2%,Zr 4%,Mo 6%	Southwestern Alloys	Alloy	216/652-9951 / /
2078	Stainless Steel A 286	Iron 55.8%, Cr 14.8%, Ni 25%	Southwestern Alloys	Alloy	213/531-2152 / /
2079	Stainless Steel 15-5	Fe75.6%,Cr14.5%,Ni4.5%,Cu3.3%	Southwestern Alloys	Alloy	213/531-2152 / /
2080	Clear Bath 105540	n-alkyl dimeth benz ammo chlor	Spectrum		04/09/81
2081	Mineral Spirits Nonexempt	Mineral Spirits	Sperry Rand	Solvent, hydrocarbon	606/324-1133 03/01/84
2082	00747 Hi-Tech Safety Sol & Deg	Methyl Chloroform	Sprayon	Cleaners	216/292-7400 03/20/89
2083	00604 Anti Rust Spray	Mineral spirits, odorless	Sprayon	Coatings	216/292-7400 05/23/86
2084	Paint Mold Release	Aerosol Lubricant	Sprayon	Lubricant	216/292-7400 07/22/87
2085	Carbon Dioxide	N/A	Springborn	Gas	11/10/82
2086	Propane	Propane (min.) 65%	Springborn	Gas	/ /
2087	Propyl Alcohol	N/A	Springborn	Alcohol	02/01/83
2088	Xylene	N/A	Springborn	Solvent	02/01/83
2089	Trichlorotrifluoroethane	N/A	Springborn	Cleaner	02/01/83
2090	Corrosion Varnish 69X545	Ethyl Alcohol	StanChem	Phenolic	203/828-0571 10/07/86
2091	Corrosion Varnish	Ethyl Alcohol	StanChem	Hydrocarbon	203/828-0571 12/09/88
2092	Muriatic Acid	Hydrochloric Acid 31.5-35.8%	Standard Chlorine (DE)	Acid	302/834-4536 03/01/90
2093	Starrett Cleaner	Dipropylene Glycol Monomethyl	Starrett	Cleaner	919/789-5141 10/01/84
2094	Foaming Terg-O-Cide Mint Disin	2-butoxyethanol, DGME	State Chem.	Cleaner,sanitizer	216/861-7114 / /
2095	Formula 999	Mixture	State Chemical Manufacturing	All purpose cleaner	216-861-7114 04/01/89
2096	Benzenesulfonyl Chloride	N/A	Stauffer		203/222-3000 10/01/84
2097	Fyrquel Fire Res Hydr Fluids	Tri-aryl Phosphate	Stauffer	Fluid, hydraulic	203/222-3000 12/01/76
2098	Fyrquel 450	Butylated Triphenyl Phosphate	Stauffer	Fluid, hydraulic	203/222-3000 01/01/85
2099	Fyrol 58	Isopropyl Alcohol	Stauffer	Flame Retardant	203/222-3000 09/27/83
2100	Tap Magic Cutting Fluid	1,1,1-Trichloroethane	Steco	Fluid, cutting	501/375-5644 05/23/86
2101	Grey Iron	Iron	Steel	Abrasive	513/874-9380 / /
2102	Cobalt-Base Alloy Powders	N/A	Stellite, Goshen	Alloy	219/534-2585 11/01/85
2103	Resinoid Bond S.C./A.O.	Alum Ox/Sili Carb 0-90% each	Sterling	Abrasive	419/447-9321 05/25/90
2104	Shellac/Alkyd Bonded S.C./A.O.	Alum Ox/Sili Carb 0-90% each	Sterling	Abrasive	419/447-9321 06/12/90
2105	Vitrified Bond S.C./A.O.	Alum Ox/Sili Carb 0-97% each	Sterling	Abrasive	419/447-9321 05/24/90
2106	Thin X	Petroleum Solvent	Sterling Clark Lurton Corp.	solvent	617-322-0163 06/01/89
2107	BR, BR717, BR67, Bonded Wheel	Rubber Organic	Sticks and Stones Unlimited	Grinding Wheel	817-488-9500 / /
2108	A/C Abrasive Wheels	Vitrified-Bonded Abrasive	Sticks and Stones Unlimited	Abrasive Wheel	817-488-9500 12/16/85
2109	Titanium Briquettes	Titanium et al	Suisman & Titanium	Alloy (Briquette)	203/522-3123 11/21/85
2110	Amdry 960	Powder- Ni, Al, Cr.	Sulzer Plasma Technik Inc.	Plasma Spray	313-288-1200 04/09/90
2111	Circo X Light	Petroleum Hydrocarbons	Sun	Oil, naphthenic	215/293-6323 05/08/81
2112	Circosol 410	Naphthenic Distillate, heavy	Sun	Solvent	215/293-6323 07/20/85
2113	Sunvis 821 WR 46	Blend	Sun	Solvent	215/293-6323 09/04/81

2114	Sun Way Lubr 118C	Heavy Paraffinic Oil	Sun	Lubricant	215/293-6487	01/20/88
2115	Sunvis 816 WR (32)	Paraffinic Distillate, heavy	Sun		215/447-1852	09/04/81
2116	Sunthene 204	Hydrotreated Petroluem	Sun Refining and Marketing Co.	Oil	215-293-6321	10/02/85
2117	Kit PCB-A-21	Isooctane	Supelco		814/359-3441	11/03/86
2118	Nitrogen	Nitrogen	Supelco	Gas	814/359-3441	07/13/87
2119	Super Tools Carbide Grades	Refactory Metal Carbide	Super Tool Division	Abrasive	616-264-8151	11/25/85
2120	CementedCarbide mixed w/cobalt	Tungsten Carbide 37.6-97%	Super Tools	Abrasive	616/264-8151	11/25/85
2121	Cemented Carbide Cobalt Binder	Refractory Metal Carbide	Super Tools	Tools	616-264-8151	11/25/85
2122	Double Six (M-2)	N/A	Superior Broach	Alloy	313/588-3920	03/13/86
2123	Corsiar (M-3 Type 1)	N/A	Superior Broach	Alloy	313/588-3920	03/13/86
2124	HS-100 (M-42)	N/A	Superior Broach	Alloy	313/588-3920	03/13/86
2125	Metal Alloys	Alloys	Superior Tube	Metal stock	215-489-5200	02/01/86
2126	Many alloys	N/A	Superior Tube	Alloy	215/489-5200	02/01/86
2127	Zo Dri Wall Primer 95	Butyl Cellosolve	Surface	Paint Product	213/269-9231	05/21/89
2128	Starrett Cleaner	Water 96.25%	Surry	Cleaner	919/786-4607	03/19/90
2129	Synthane	Silicone Resin, cured +glass	Synthane-Taylor	Laminate, industrial	215/666-0300	04/25/84
2130	Formula 7000 H.D. Clean-Degrea	Dipropylene glycol methyl ethe	Synthetic	Cleaner,degreaser	508/957-2919	01/01/89
2131	Formula 7000 H.D. Cleaner	Alkaline Detergent	Synthetic Labs Inc.	Cleaner-Degeaser	508-957-2919	01/01/90
2132	Titanium sponge	Titanium	TIMET	Alloy (sponge)	702/564-2544	/ /
2133	Titanium Metal (ingot)	Titanium	TIMET	Alloy (ingot)	702/564-2544	/ /
2134	TMF-1,TMF-IA,Titanium Fines	Titanium	TIMET	Alloy	702/564-2544	/ /
2135	General MSDS-Specialty Alloys	N/A	TRW	Alloy	216/868-7150	03/15/86
2136	Talide Carbide Grades	Refactory Metal Carbide	TSC Carbide	Abrasive	602-624-4600	11/25/85
2137	Peel Coat Type 1	Ethylcellulose Plastic Coating	TSC Carbide Inc.	Coating	602-624-4600	/ /
2138	Trimet 258	Trimet Brazing Filler Metal	TSC Carbide Inc.	Brazing Filler Metal	602-624-4600	12/16/83
2139	Titanium Nitride Coating	Titanium Nitride	TSC Carbide Inc.	Coating	602-624-4600	10/27/89
2140	Edge Lube	N/A	Tapmatic	Lubricant	714/261-9302	09/24/85
2141	Edge Creme	N/A	Tapmatic	Lubricant	714/261-9302	09/24/85
2142	Edge	N/A	Tapmatic	Lubricant	714/261-9302	09/23/85
2143	Dual Action Cleaner	CAS 1310-58-3	Tapmatic	Cleaner	714/261-9302	11/15/85
2144	Edge II Super Concentrate	N/A	Tapmatic	Lubricant	714/261-9302	09/24/85
2145	Edge Mist	N/A	Tapmatic	Lubricant	714/261-9302	09/24/85
2146	Tapmatic Cutting Fluid 2	Solvent: CAS 8008-20-6 70%	Tapmatic	Lubricant	714/261-9302	09/23/85
2147	Tapmatic Cutting Fluid 1	Solvent: CAS 71-55-6 85%	Tapmatic	Lubricant	714/261-9302	/ /
2148	Allvac 718...Allcorr	Steel, nickel	Teledyne Allvac	Alloy	704/289-4511	07/15/85
2149	Allvac Astroloy	Nickel Alloy	Teledyne Allvac	Alloy	704/289-4511	10/09/84
2150	Allvac 718	Nickel Based Alloy	Teledyne Allvac	Alloy	704/289-4511	07/15/85
2151	Allvac 30,40,55,70...6-2-4-6	Titanium	Teledyne Allvac	Alloy	704/289-4511	07/15/85
2152	Nickelvac	Iron-based alloy	Teledyne Allvac	Alloy	704/289-4511	07/15/85
2153	Nickelvac F75,L605	Cobalt	Teledyne Allvac	Alloy	704/289-4511	07/15/85
2154	Lead Acid Battery	Lead, antimony	Teledyne Battery	Battery, hard rubber	714/793-3131	/ /
2155	All Firthite Tungsten Carbide	Tungsten Carbide	Teledyne Firth Sterling	Insulation	615/793-4200	11/01/85
2156	Firthite Tungsten Carbide	Refatory Metal Carbide	Teledyne Firth Sterling	Abrasive	615-793-4200	09/08/89
2157	Cemented T.C. w/ cobalt/nickel	Tungsten Carbide 67-97%	Teledyne Firth Sterling	Abrasive	615/793-4200	09/08/89
2158	Oster Bestoil, Light	Sulfurized Paraffin Oil	Teledyne Landis	Lubricant	717/762-3151	05/01/88

2159	Specialty Steels/Carbides for	N/A	Teledyne Landis	Abrasive	717/762-3151	11/01/85
2160	Oster Bestoil,Dark/Lancut Cutt	Sulfurized Paraffin Oil 85%	Teledyne Landis	Lubricant	717/762-3151	05/01/88
2161	Welding Consum/Related Product	Steel	Teledyne McKay	Welding Consumables	717/845-7581	11/01/85
2162	Vasco Specialty Steels	Steel, specialty	Teledyne Vasco	Alloy	412/537-5551	11/01/85
2163	Pyromark Paint Series 2500	Aromatic Naphtha	Tempil	Paint Product	201/757-8300	11/24/85
2164	Temp-Alarm 13A Standard (Ind)	Toluene	Tempil	Paint Product	201/757-8300	11/24/85
2165	Temp-Alarm Thinner	1,1,1-Trichloroethane	Tempil		201/757-8300	11/24/85
2166	Temp-Alarm Standard (Indoor)	1,1,1-Trichloroethane	Tempil		201/757-8300	11/24/85
2167	Tempilstik	Mixture organic compounds	Tempil Division Big Three Ind.	Temperature Indicato	201-757-8300	06/14/88
2168	413 Bonding Additive	Ethylene Glycol Mono. Eth. Ace	Tennant	Urethane Bonding Add	612/540-1381	03/24/81
2169	509 Remover	Methylene Chloride	Tennant	Paint Remover	612/540-1381	04/04/81
2170	530 Curing Membrane Remover	Ethylene Glycol Mono.Ether Ace	Tennant	Solvent Cleaner	612/540-1381	03/30/81
2171	122 Urethane Resin	Arom. Hydro.,Isocy.Polye.Prepo	Tennant	Urethane Finish	612/540-1381	04/04/81
2172	Tenn Brand Tri-Basic Cop Sulfa	Copper Sulfate, basic	Tennessee	Inorgnaic Salt	404/233-6811	06/06/84
2173	00651 Way Lubricant Oil	Metal Working Oil	Texaco	Oil, Metal Working	914/831-3400	01/09/86
2174	00706 Regal R&O 100	Turbine Oil	Texaco	Oil	914-831-3400	05/22/89
2175	00499 EDM Fluid	Petroleum Distillates	Texaco	Fluid, E.D.M.	914/831-3400	02/12/88
2176	00735 Hydra Oil 19	Petroleum Distillates,paraffin	Texaco	Oil, naphthene pale	914/831-3400	06/05/86
2177	00600 Transformer Oil	Petroleum Distillate 95-99.99%	Texaco	Lubricant	914/831-3400	09/20/89
2178	00482 Transultex A	Petroleum Distillates	Texaco	Coolant	914/831-3400	10/28/86
2179	1537 Aircraft Hydraulic Oil	Mineral Oil	Texaco	Oil, hydraulic	914/831-3400	05/01/80
2180	01657 Rando Oil HD 32	Hydraulic Oil	Texaco	Oils, cutting	914/831-3400	04/17/86
2181	02317 Multigear Lub EP SAE 85W	Petroleum Oil	Texaco	Lubricant, gear	914/831-3400	01/06/83
2182	01658 Rando Oil HD 46	Petroleum Distillate,paraffini	Texaco	Oil, hydraulic	914/831-3400	11/20/85
2183	01567 Capella Oil WF 32	Refrigeration Oil	Texaco	oil	914-831-3400	11/01/84
2184	01659 Rando Oil HD 68	Petroleum Distillates,paraffin	Texaco	Oil, hydraulic	914/831-3400	08/20/86
2185	1857 Turbine Hydr Oil 2135 TH	Mineral Oil	Texaco	Oil, hydraulic	914/831-3400	01/01/78
2186	C7321 Methanol	Methyl Alcohol	Texaco	Solvent	914/831-3400	12/13/85
2187	561 Way Lubricant 68	Petroleum Oil	Texaco	Lubricant	914/831-3400	01/06/83
2188	00522 522 Oil 19 (NF)	Petroleum Distillates, paraffi	Texaco	Lubricant	914/831-3400	/ /
2189	00995 Multifak EP 2	Petroleum Oil	Texaco	Lubricant	914/831-3400	12/04/85
2190	01564 Almag Oil	Petroleum Oil	Texaco	Fluid, Metal Working	914/831-3400	01/07/83
2191	Multigear Lubricant	Gear Oils	Texaco	Lubricant	914/831-3400	05/06/87
2192	Antistatic Screen Cleaner	Isop Alc 29%,Deion Water 70.5%	Texwipe	Cleaner	201/327-9100	05/01/87
2193	Freon TP-35 (Aerosol)	Trichlorotrifluoroethane 64.7%	Texwipe	Cleaner	201/327-9100	05/01/87
2194	Keyboard Kleen	Trichlorotrifluoroethane 64.7%	Texwipe	Cleaner	201/327-9100	05/01/87
2195	Officeduster	Dichlorodifluoromethane	Texwipe	Cleaner	201/327-9100	05/01/87
2196	Wetswab	Isopropyl Alcohol	Texwipe	Cleaner	201/327-9100	12/01/86
2197	Tape Head Cleaner (Non-Aerosol	Trichlorotrifluoroethane 64.7%	Texwipe	Cleaner	201/327-9100	05/01/87
2198	Tape Head Cleaning Pad	Isopropyl Alcohol 91%	Texwipe	Cleaner	201/327-9100	05/01/87
2199	Frekote #1 Dry Lubricant	Blend	The Dexter Corperation	Aerosol Lubricant	603-474-5541	04/13/90
2200	Frekote #1 Dry Lubricant	Fluorotelomer	The Dexter Corporation	Lubricant	603-474-5541	10/01/90
2201	High Speed Steel Cutting Tools	Steel	The Hanson Whitney Company	Cutting Tools	203-249-9381	/ /
2202	Lacquer Thinner	Mixture	The Sherwin Williams Company	Thinner	216-566-2902	09/12/90
2203	Insulating Cement	Calcium Silicates	Thermic	Insulation	217/627-2101	/ /

2204	TR-19	Vermiculite	Thermic	Insulation	217/627-2101	/ /
2205	TR-20	Earth,nonflux calc.Diatomaceou	Thermic	Insulation	217/627-2101	/ /
2206	Aluminum Oxide & Tan-15 Coatin	N/A	Ti-Coating	Coating	313/463-8100	/ /
2207	Aluminum Oxide	N/A	Ti-Coating	Coating	313/463-8100	/ /
2208	Alloy Steel	N/A	Timken	Alloy	216/438-3360	09/01/89
2209	Carbon Steel	N/A	Timken	Alloy	216/438-3360	09/01/89
2210	Alloy Steels w/high silicon mo	N/A	Timken	Alloy	216/438-3360	09/01/89
2211	Nitriding Steel	Steel, nitriding	Timken	Alloy	216/438-3360	09/01/89
2212	Stainless Steel	Steel, stainless	Timken	Alloy	216/438-3360	09/01/89
2213	Alloy Steel	Alloy Steel	Timken Company	Alloy Steel	216-438-3360	09/01/89
2214	Carbon Steel	Carbon Steel	Timken Company	Carbon Steel	216-438-3360	09/01/89
2215	Alloy Steel	Alloy Steel Silicon Modificati	Timken Company	Steel	216-438-3360	09/01/89
2216	Nitriding Steel	Steel	Timken Company	Steel	216-438-3360	09/01/89
2217	Stainless Steel	Stainless Steel	Timken Company	Stainless Steel	216-438-3360	09/01/89
2218	071 Endura-Shield:F071-AL82A	Propylene Glycol Monomethyl...	Tnemec	Polyester	816/474-3400	01/12/87
2219	071 Endura-Shield:F071-0071B	HDI Polymer	Tnemec	Polyisocyanate	816/474-3400	01/12/87
2220	Tracer-Tech	Kerosine	Tracer-Tech	Penetrant, inspectio	213/876-2660	03/21/77
2221	Compressor Oil 22	Mineral Oil	Trane	Lubricant	608/787-2000	03/26/87
2222	Refrigeration Oil 15-B	Mineral Oil, refined	Trane	Lubricant	608/787-2000	06/15/87
2223	Marine-Tex	Bisphenol-A Glycidyl Ether	Travaco	Resin, epoxy	717/884-7740	01/30/88
2224	Pristine	N/A	Tribochem		416/336-8511	08/07/87
2225	Water-Jel Blankets	Mixture	Trilling Medical Technologies	Sterile Burn Dressin	201-507-8300	09/07/89
2226	High Speed...T.C. w/ binders	N/A	Tungsten	Abrasive	803/877-2044	11/01/85
2227	Cemented Carbide Cobalt Binder	Refractory Metal Carbide	Tungsten Carbide	Tool	714-832-3013	/ /
2228	All TCM Carbide Grades	Cemented Carbide, Cobalt Bind.	Tungsten Carbide Manufacturing	Abrasive	501-636-1515	/ /
2229	Turco Dy-Chek Developer NA PSU	Isopropyl Alcohol	Turco	Developer	213/634-3300	07/01/80
2230	Turco 3878 LF-NC	N/A	Turco	Cleaner, water-emuls	213/634-3300	02/24/83
2231	Turco 4181 Ind.	Sodium Hydroxide	Turco	Cleaner, metal	213/634-3300	07/01/80
2232	Turco 3878	Sodium Chromate	Turco		213/634-3300	04/01/82
2233	Turco Stripper	Sodium Hydroxide	Turco	Cleaner, metal	213/634-3300	12/01/80
2234	Turco 4215	Sodium Chromate,Sodium Nitrate	Turco		213/634-3300	07/01/80
2235	Turco Carbostrip	O-Dichlorobenzene,cresylic aci	Turco		213/634-3300	07/01/80
2236	Turco 3878	Mixture	Turco Products Inc.		714-890-3600	05/01/89
2237	Mercury:5097-11,26,29,13,28,30	N/A	Tycos		704/684-4895	/ /
2238	Mineral Oil Mist	Mineral Oil Mist	US Government	Guideline:Occup.Hlth		09/01/78
2239	Lubricating Oil	Specification	US Military	Lubricant		/ /
2240	Polychem USD-401	Aliphatic Hydrocarbon	US Polychemical	Deagreaser	914/356-5530	11/09/83
2241	Hot Rolled HSLA Steel-Plates	Steel, HSLA	US Steel	Alloy	413/433-6840	08/01/85
2242	Hot Rolled Alloy Steel- Plates	Steel, alloy	US Steel	Alloy	412/433-6840	08/01/85
2243	Hot Rolled Carb Stl-StrucShape	Steel, carbon	US Steel	Alloy	412/433-6840	08/01/85
2244	Hot Rolled Alloy Steel-StrShap	Steel, alloy	US Steel	Alloy	412/433-6840	08/01/85
2245	Ingots, Blooms, Slabs, Billets	Steel, alloy	US Steel	Alloy	412/433-6840	08/01/85
2246	Hot Rolled Carbon Steel-Plates	Steel, carbon	US Steel	Alloy	412/433-6840	08/01/85
2247	Ingots,Blooms,Slabs,Billets	Steel, carbon	US Steel	Alloy	412/433-6840	08/01/85
2248	Ingots,Blooms,Slabs,Billets	Steel, leaded carbon	US Steel	Alloy	412/433-6840	08/01/85

2249	Wire Rods...Cold Finished Bars	Steel, alloy	US Steel	Alloy	412/433-6840	08/01/85
2250	Wire Rods...Cold Finished Bars	Steel, alloy leaded	US Steel	Alloy	412/433-6840	08/01/85
2251	Structural Pipe/Tubing-Alloy	Steel, alloy	US Steel	Alloy	412/433-6840	08/01/85
2252	Wire Rods...Cold Finished Bars	Steel, carbon	US Steel	Alloy	412/433-6840	08/01/85
2253	Wire Rods...Cold Finished Bars	Steel, high strength low alloy	US Steel	Alloy	412/433-6840	08/01/85
2254	Wire Rods...Cold Finished Bars	Steel, carbon leaded	US Steel	Alloy	412/433-6840	08/01/85
2255	Structural Pipe+Tubing-CarbStl	Steel, carbon	US Steel	Alloy	413/433-6840	08/01/85
2256	Insblok-19	N/A	USG		312/321-4383	08/30/85
2257	Common Wrought Aluminum Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2258	Electronic Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2259	Cobalt Based Superal+Related	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2260	High Manganese Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2261	Precip Harden+High Iron Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2262	Nickel+Nickel Based Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2263	Nickel+Nickel-Iron-Chrome Allo	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2264	Standard Carbon Steels	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2265	Stainless and Related Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2266	Titanium+Titanium Based Alloys	High perform,heat resist alloy	Ulbrich	Alloy	203/239-4481	03/01/89
2267	Special Purpose Metal Alloys	Metal and Alloys	Ulbrich of Georgia Inc.	syock	404-921-3100	11/22/85
2268	Cemented T.C. mixed w/cobalt	Tungsten Carbide 60-97%	Ultra-Met	Abrasive	513/653-7133	01/01/90
2269	Assembly Fluid #1	Acrylic polymer/refined oil	Ultrachem Inc.	Oil	302-571-8520	03/09/89
2270	Air	N/A	Union Carbide	Gas	304/744-3487	08/01/85
2271	Carbon Monoxide	N/A	Union Carbide	Gas	304/744-3487	09/01/85
2272	Carbon Dioxide	N/A	Union Carbide	Gas	304/744-3487	07/01/86
2273	Argon	N/A	Union Carbide	Gas	304/744-3487	12/01/86
2274	Acetone	Ketone	Union Carbide	Cleaner	304/744-3487	04/01/85
2275	Acetylene	N/A	Union Carbide	Gas	304/744-3487	04/01/87
2276	Butane	N/A	Union Carbide	Gas	304/744-3487	/ /
2277	Grafoil	Graphite	Union Carbide	Laminates,gaskets	304/744-3487	/ /
2278	Cellosolve Solvent	2-Ethoxyethanol	Union Carbide		304/744-3487	08/01/85
2279	GTF,GTH,TG-256,TG-257	Graphite	Union Carbide	Adhesive	304/744-3487	/ /
2280	Isopropanol, Anhydrous	Isopropyl Alcohol	Union Carbide	Alcohol	304/744-3487	03/01/86
2281	Isobutane	N/A	Union Carbide	Gas	304/744-3487	/ /
2282	Methane	Alkane	Union Carbide	Gas	304/744-3487	09/01/85
2283	Methanol	Methyl Alcohol	Union Carbide	Solvent	304/744-3487	04/01/83
2284	Hydrogen (High Pressure Gas)	N/A	Union Carbide	Gas	304/744-3487	01/01/80
2285	Methyl Ehtyl Ketone	Ketones	Union Carbide	Paint Thinner	304/744-3487	/ /
2286	Nitric Oxide	Nitric Oxide	Union Carbide	Gas	304/744-3487	01/01/89
2287	Nitrogen	N/A	Union Carbide	Gas	304/744-3487	08/01/85
2288	Niax catalyst Tmbda	N,N,N',N'-Tetramethylbutanedia	Union Carbide	Tertiary Amine	800/822-4357	02/09/90
2289	Nitrogen	Nitrogen	Union Carbide	Various		08/01/85
2290	NI-343...NI-246-3	Nickel,Chromium,Aluminum,Y,oxy	Union Carbide	Alloy	304/744-3487	10/26/88
2291	Propane	N/A	Union Carbide	Gas	304/744-3487	11/01/89
2292	Oxygen	N/A	Union Carbide	Gas	304/744-3487	09/01/85
2293	Ucarmod A.G. Polyether PWB-500	PolymerOrg.Acid w/MethylOxiran	Union Carbide	Acid Grafted Polyeth	304/744-3487	05/29/90

2294	Stargon Argon,CarbDiox,OxyMixt	Argon >90%	Union Carbide	Gas	304/744-3487	03/01/88
2295	Ucon Fluorocarbon 22	Chlorodifluoromethane	Union Carbide	Gas	304/744-3487	11/01/88
2296	NI-292, NI-164-2	Nickel, Chromium, Aluminum	Union Carbide	Metal Powder	317-240-2650	12/17/90
2297	CRC-106	Chromium Carbide, Nickel	Union Carbide	Metal Powder	317-240-2650	08/09/89
2298	Ucon Fluorocarbon 12	Dichlorodifluoromethane	Union Carbide	Gas	304/744-3487	09/01/85
2299	Carbide/Carbide Tipped Tools	TungstenCarbide mixed w/cobalt	Union/Butterfield	Metal Removal	704/253-3220	11/25/85
2300	Union/Butterfield Cutting Tool	High Speed Steel	Union/Butterfield	Alloy (tool)	704/253-3220	11/01/85
2301	Royalite 57 and 59	Acrylonitrile..(A.B.S.-P.V.C.)	Uniroyal	Alloy	219/267-7127	/ /
2302	Rubbing Stones	Silicon Carbide	United Abrasive Inc.	Abrasive	203-456-7131	11/01/88
2303	Plumbers Roll	Aluminum Oxidewith cloth back	United Abrasive Inc.	Abrasive cloth	203-456-7131	11/01/88
2304	Sait Screen	mixture	United Abrasive Inc.	abrasive	203-456-7131	11/01/88
2305	Coated Abrasive Product	Resin	United Abrasives Inc.	Abrasive	203-456-7131	11/01/88
2306	Grinding Wheels, Resinoid	mixture	United Abrasives Inc.	Grinding Wheel	203-456-7131	11/01/88
2307	Vitrified Grinding Wheels	mixture	United Abrasives Inc.	Grinding Wheel	203-456-7131	11/01/88
2308	AM-350	Iron/Chromium/Nickel	Universal Wire Works	Weld wire	713-649-3828	01/06/87
2309	Calibr Fluid MIL-C-7024C Type2	Petroleum Naphtha	Unocal	Fluid, calibration	312/490-2500	03/23/87
2310	AMSCOSolvent 1103	Naphthol Spirits	Unocal	Solvent	312/490-2500	10/20/80
2311	Mil-C-7024C II (AMSCO/Shell)	Petroleum Naphtha	Unocal	Lubricant	312/490-2500	07/23/86
2312	Xylene	N/A	Unocal	Solvent	312/490-2500	07/23/86
2313	Super High Flash Naphtha-Ar100	Petroleum Naphtha	Unocal	Solvent	312/490-2500	07/23/86
2314	Isocyanates&Isonate Components	Isocyanates&Isonate Components	Upjohn	Safety Information		01/01/75
2315	Cosmoline Remover	1-8(9) P-Menthadiene	VIP Products	Remover	609/435-3555	/ /
2316	VIP Champion	2-Butoxyethanol,Potas. hydrox.	VIP Products		609/435-3555	/ /
2317	72-3612808 Sythtsn	MEK,Diacetone Alc,M. Isobu K.	Valspar	Paint Product	612/332-7371	02/04/88
2318	72-3612810 Synthsn 200	M. Isobu K.,Diacetone Alcohol	Valspar	Paint Product	612/332-7371	05/04/90
2319	3612810	Mixture	Valspar	Paint Product	612/332-7371	11/19/87
2320	72-00T336A Thinner	Methyl Ethyl Ketone	Valspar	Thinner	612/332-7371	04/12/90
2321	Clear S.G. Peelcote	Vinyl Plastisol	Valspar		612/332-7371	09/27/85
2322	Paint Product	Organic Solvent(s)	Valspar	Paint Products	201/467-8500	07/01/81
2323	Dry-O-Lite		Van Air Systems Inc.	Desiccant	814-774-2631	02/22/90
2324	Padding Compound	Polyvinyl Acetate 50%	Van Son Holland Ink	Ink	516/294-8811	11/01/88
2325	Van Straaten 759	Petroleum Oils	Van Straaten	Coolant	312/454-1000	02/01/85
2326	Vantrol 599	Petroleum Oils,Mineral oil(sul	Van Straaten	Coolant	800/621-0829	07/08/85
2327	Vantrol 570	Petroleum Oils,hydro.+refined	Van Straaten		312/454-1000	10/29/86
2328	Vantrol 275	Triethanolamine,diethanolamine	Van Straaten	Lubricant/Coolant	312/454-1000	06/19/84
2329	Van Straaten 5299	Petroleum Oil, hydrotreated	Van Straaten		312/454-1000	11/11/87
2330	Van Straaten 653	Petroleum Oils,hydro. or refin	Van Straaten	Coolant	800/621-0829	01/28/86
2331	Van Straaten 975	Diethanolamine	Van Straaten	Coolant	800/621-0829	04/04/86
2332	Van Straaten 936	Triethanolamine	Van Straaten	Coolant	800/621-0829	06/27/84
2333	Van Straaten Defoamer 12	Petroleum Oil, hydrotreated	Van Straaten	Cutting,grinding	800/621-0829	10/23/85
2334	Van Straaten 5700	Petroleum Oils	Van Straaten	Coolant	800/621-0829	07/17/85
2335	Innovative ComputerBlend 75/25	Freon TF 75%, Isopropanol 25%	Van Waters & Rogers	Cleaner		10/08/87
2336	Anti-Static Spray (Aerosol)	Trichloroethane 70-90%	Varn	Cleaner	201/337-3600	11/01/85
2337	Copper Plating Solution	Ethylene Gly/2-Propanol 40-50%	Varn		201/337-3600	11/01/85
2338	Compound 747	Paraffin Oils 80-95%	Varn		201/337-3600	11/01/85

2339	Met Wash	Volatile Organic Compounds 98%	Varn		201/337-3600	12/31/86
2340	Rejuvenator XL	Polyglycol Ethers 18-45%	Varn		201/337-3600	11/01/85
2341	Super Rubber Rejuvenator	Volatile Organic Compounds 97%	Varn		201/337-3600	01/05/87
2342	Varn Blue Velvet	Aliphatic Solvents 30-40%	Varn		201/337-3600	11/01/85
2343	Super-Lene Fountain Solution	Alcohol 8-14%	Varn		201/337-3600	11/01/85
2344	Take It Off	Volatile Organic Comp 25.5%	Varn		201/337-3600	12/30/86
2345	CE-Yellow Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2346	CE-Magenta Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2347	CE-Cyan Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2348	CE-Process Black Typ H, TypV80	Hydrocarbon Solvent, isoparaff	Versatec	Toner (Premix)	800/828-6571	09/17/87
2349	ECP-Process Black Toner Conc	Hydrocarbon Solvent, isoparaff	Versatec	Toner Concentrate	800/828-6571	09/18/87
2350	ECP-Magenta Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2351	ECP-Magenta Toner Concentrate	Hydrocarbon Solvent, isoparaff	Versatec	Toner Concentrate	800/828-6571	09/16/87
2352	ECP-Yellow Toner Concentrate	Hydrocarbon Solvent, isoparaff	Versatec	Toner Concentrate	800/828-6571	09/16/87
2353	ECP-Cyan Toner Concentrate	Hydrocarbon Solvent, isoparaff	Versatec	Toner Concentrate	800/828-6571	09/16/87
2354	ECP-Process Black,Typ H,TypV80	Hydrocarbon Solvent, isoparaff	Versatec	Toner Concentrate	800/828-6571	09/18/87
2355	Electrographic Paper	Calcium Carbonate	Versatec	Coating (paper)	800/828-6571	09/16/87
2356	ECP-Cyan Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2357	ECP-Process Black Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2358	ECP-Yellow Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2359	Clean-ups	Isopropyl Alcohol	Versatec	Solvent	800/828-6571	03/20/87
2360	Matte-Back Polyester Film	Polyethylene Terephthalate	Versatec	Film, polyester	800/828-6571	12/09/86
2361	Translucent Paper	Calcium Carbonate	Versatec	Coating (paper)	800/828-6571	12/09/86
2362	Spectrum Yellow Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2363	Thermal Head Cleaner	Polydimethylsiloxane	Versatec	Cleaner, thermal head	800/828-6571	01/22/87
2364	Spectrum Black Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/18/87
2365	Spectrum Magenta Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2366	Vellum Paper	Acrylic Resin, modified	Versatec	Coating (paper)	800/828-6571	12/09/86
2367	Spectrum Cyan Toner Premix	Hydrocarbon Solvent, isoparaff	Versatec	Toner Premix	800/828-6571	09/16/87
2368	Versatec Clear Dispersant	Hydrocarbon Solvent, isoparaff	Versatec	Clear Dispersant	800/828-6571	09/16/87
2369	Alumina (Aluminum Oxide)	N/A	Vesuvius McDanel	Oxide	412/843-8300	/ /
2370	Mullite (Aluminum Silicate)	N/A	Vesuvius McDanel	Silicate	412/843-8300	03/19/90
2371	Silica (Silicon Dioxide)	N/A	Vesuvius McDanel	Oxide	412/843-8300	03/19/90
2372	Zirconium Oxide/Yttrium Oxide	N/A	Vesuvius McDanel	Oxide	412/843-8300	03/19/90
2373	Sodium Bisulfite, Anhydrous	N/A	Virginia	Acid	804/393-3100	03/01/87
2374	Suniso Refrigeration Oil 3GS	Mineral Oil	Virginia KMP	Lubricant	214/330-7731	09/19/86
2375	V-657 A	N/A	Visilox (VSI)	Polysiloxane	518/283-5963	04/17/89
2376	V-06	VM&P Naphtha 87%	Visilox (VSI)	Polysiloxane	518/283-5963	12/08/89
2377	V-657 B	Carbon Black <13%	Visilox (VSI)	Polysiloxane	518/283-5963	04/14/89
2378	V-651B	Polysiloxane	Visilox Systems Inc.		518-283-5963	04/12/89
2379	V-651A	Polysiloxane	Visilox Systems Inc.		518-283-5963	04/12/89
2380	Brazing Tape AMS4770...WA996	N/A	Vitta	Alloy	203/790-8155	04/01/86
2381	Braz-Rope AMS4776...CPW475	N/A	Vitta	Alloy	203/790-8155	04/01/86
2382	Brazing Tape AMS...B50TFXXX	N/A	Vitta	Brazing Tape	203/762-8366	04/01/86
2383	Brazing Foil/Preforms AMS..BNi	N/A	Vitta	Alloy	203/762-8366	04/01/86

2384	E-1613 Engine Gray Baking Enam	Mineral Spirits	Voltax	Paint Product	203/333-2158	05/20/82
2385	T-64 Epoxy Thinner	Toluene	Voltax	Paint Product	203/333-2158	11/14/83
2386	V-4936 Clear Baking Epoxy	Xylol,toluol,M.Isobutyl K.	Voltax	Paint Product	203/333-2158	09/24/81
2387	T-299 Epoxy Thinner	Toluene	Voltax	Paint Product	203/333-2158	06/14/85
2388	Solvent 111 Chloroethane	1,1,1-Trichlor 96.5%	Vulcan	Solvent	314/524-5751	06/01/89
2389	Pliobond 20	Nitrile Rubber Resin insolvent	W.J. Ruscoe Co.	Industrial Adhesive	216-253-8148	06/01/86
2390	WD-40 Aerosol	Aliphatic Petroleum Distillate	WD-40	Rust Inhibitor	619/275-1400	01/01/89
2391	Nicobraz Cement 500	1,1,1-Trichlor 92%	Wall Colmonoy	Adhesive	313/585-6400	03/31/89
2392	Nicrobraz Blasting Grit	Steel, stainless, nickel/chro.	Wall Colmonoy	Alloy	313/893-3800	12/01/85
2393	Brown Aluminum Oxide	N/A	Washington Mills	Oxide	716/278-6763	12/20/88
2394	Nickel Alloys	Nickel	Waukesha	Alloys	414/542-0714	11/01/85
2395	523005...524099	Chromium,Nickel,Iron,Copper	Waukesha Foundry	Alloy?	414/542-0741	11/01/85
2396	Carbon Steel Wire Brushes	Steel	Weiler	Alloy (wire brushes)	717/595-7495	/ /
2397	Stainless Steel Wire Brushes	Steel, stainless	Weiler	Alloy (wire brushes)	717/595-7495	/ /
2398	Stainless Steel Wire Brushes	Stainless Steel	Weiler Brush Company	Brushes	717-595-7495	/ /
2399	Carbon Steel Wire Brushes	Metal	Weiler Brush Company Inc.	Wire Brush	717-595-7495	/ /
2400		Isopropyl Alcohol 83%	Welch Allyn	Alcohol	315/685-8351	/ /
2401	Tool Steels	Steel Alloy	Weldon Tool Co.	Cutting Tools	216-721-5454	10/21/88
2402	All Carbide grades	Cemented Carbide Carbide Bind.	Weldon Tool Company	Abrasive	216-721-5454	02/16/90
2403	Super White Emulsion Bowl	Hydrochloric Acid,Phosph. Acid	Wepak	Emulsion Bowl	704/334-5781	/ /
2404	"VX" Super Refractory, HVX	Silica	Wesgo	Ceramics	415/592-9440	01/20/87
2405	Silicon Nitride Ceramics	N/A	Wesgo	Ceramics	415/592-9440	06/01/88
2406	Regular Sto Liq,S.L. 62A/62-30	Stopyt Liquid	Wesgo		415/592-9440	01/30/87
2407	Regular Sto Pas STP-57,S.P.62A	Stopyt Paste	Wesgo	Alloy	415/592-9440	01/30/87
2408	Wesgo Metallizing Paints	Various	Wesgo	Paint Product	415/592-9440	11/01/87
2409	Wesgo Metal Products + Alloys	N/A	Wesgo	Alloys	415/592-9440	01/30/87
2410	Wesgo Alumina Ceramics	Aluminum Oxide	Wesgo	Ceramics	415/592-9440	01/30/87
2411	FC-11, FC-12 Gel	Alcohol Mixture	Wesgo	Gel braze alloy	415-592-9440	05/09/90
2412	FC-10 Gel	Alcohol Mixture	Wesgo	Gel Braze Alloy	415-592-9440	05/09/90
2413	VX Super Refractory, HVX	Fused Quartz	Wesgo		415-592-9440	12/21/90
2414	Silicon Nitride Ceramics	Metals Nitride	Wesgo		415-592-9440	02/01/89
2415	Wesgo Metallizing Paints	Metals, Metal Oxide, Solvents	Wesgo	Paint	415-592-9440	12/21/90
2416	Stopyt Liquid/Paste	Alcohol, Ketone, Glycol, Oxide	Wesgo		415-592-9440	01/07/91
2417	Wesgo Metal Products & Alloys	Metal elements/alloys	Wesgo	Metal	415-592-9440	12/21/90
2418	Wesgo Alumina Ceramics	Metal Oxides	Wesgo		415-592-9440	01/30/87
2419	Nuchar Active Carbon	N/A	Westvaco		703/962-2111	12/01/71
2420	All Carbide Grs of Cut/Form To	TungstenCarbide mixed w/cobalt	Wetmore	Metal Removal	213/723-9015	11/25/85
2421	CementedCarbide mixed w/cobalt	Tungsten Carbide 70-97%	Wetmore	Abrasive	213/723-9015	11/25/85
2422	High Speed Steel: M-2,42 Tools	N/A	Wetmore	Abrasive	213/723-9015	11/25/85
2423	Airbrasive Powder No. 3	Aluminum Oxide	White		201/752-8300	12/01/79
2424	Campbelline Cool Blue	N/A	White & Bagley	Coolant	617/791-3201	/ /
2425	PT 3-6-10 Aero-Cide - 24 oz.	Solvents+Propellants	Whitmire	Insecticide	314/225-5371	12/03/86
2426	PT 240 Perma-Dust	Solvents+Propellants	Whitmire	Insecticide	314/225-5371	07/01/87
2427	Whitmire PT 565 Plus - 23 oz.	Solvents & Propellants 89.5%	Whitmire		314/225-5371	06/10/88
2428	Whitmire PT 515 Wasp Freeze II	Trichlorofluoromethane 66.8%	Whitmire		314/225-5371	06/30/87

2429	Whitmire PT 240 Perma-Dust	Solvents & Propellants 79.5%	Whitmire		314/225-5371	05/07/86
2430	Alum Tap (Bulk)	Perchloroethylene 5-10%	Winfield Brooks		617/933-5300	06/04/85
2431	Tapfree (bulk)	1,1,1-Trichlor 85-90%	Winfield Brooks	Adhesive	617/933-5300	06/04/85
2432	WA51		Winokur		203/282-1188	10/13/89
2433	Alloys: 13 MSDS	N/A	Wisconsin Centrifugal	Alloy	414/544-7700	10/10/86
2434	Chromium Alloyed 1-10%Cr,<1%Ni	Cr,Cr(VI),Fe,Mn,Mo,Si,W,V	Wisconsin Centrifugal	Alloy	414/544-7700	10/14/85
2435	Cr/Ni Alloyed 1-10% Cr,1-10%Ni	Cr,Cr(VI),Fe,Ni	Wisconsin Centrifugal	Alloy	414/544-7700	10/11/85
2436	Nickel Alloyed <1%Cr, 1-10%Ni	Cr,Fe,Mn,Mo,Ni,Si	Wisconsin Centrifugal	Alloy	414/544-7700	10/10/85
2437	Unalloyed <1%Cr, <1% Ni	Iron oxide,Mn,Mo,Ni,Si	Wisconsin Centrifugal	Alloy	414/544-7700	04/21/87
2438	Magnacut	Petroleum Oil	Witco	Hydrocarbon	312/239-8300	10/31/84
2439	Macco 768-1	Petroleum Oil	Witco	Hydrocarbon	312/239-8300	10/31/84
2440	Nickel Sulfamate	N/A	Witco	Nickel Salt Solution	313/437-8161	06/28/88
2441	Syncrocut 983-EP	N/A	Witco	Fluid, cutting	312/239-8300	10/31/84
2442	Chrmic Acid Mixture	N/A	Witco: Allied-Kelite Div.	Acid	313/437-8161	09/23/87
2443	Iridite 14-2	Chromic Acid Mixture	Witco: Allied-Kelite Div.	Acid	313/437-8161	09/23/87
2444	SNR-24	Sulfamate Nickel Solution	Witco: Allied-Kelite Div.		313/437-8161	09/27/85
2445	Carbon and Alloy Cast Steels	SC-000-009 REV:6	Wollaston	Alloy	617/848-3333	05/06/88
2446	Chromium Alloyed Steel Casting	SC-000-019 REV:2	Wollaston	Alloy (casting)	617/848-3333	05/03/88
2447	Chromium Based Steel Castings	SC-000-029 REV:2	Wollaston	Alloy (casting)	617/848-3333	05/06/88
2448	High Alloy Cast Steels	SC-000-002 REV:3	Wollaston	Alloy	617/848-3333	05/05/88
2449	Nickel Alloyed	SC-000-016 REV:6	Wollaston	Alloy	617/848-3333	05/03/88
2450	Nickel Based Cast Steels	SC-000-008 REV:4	Wollaston	Steels	617/848-3333	05/05/88
2451	Aluminum Alloy 7175	N/A	Wyman-Gordon	Alloy	617/756-5111	05/24/85
2452	Aluminum Alloy 7050	N/A	Wyman-Gordon	Alloy	617/756-5111	05/24/85
2453	Aluminum Alloy 7049	N/A	Wyman-Gordon	Alloy	617/756-5111	05/24/85
2454	Titanium Alloy 1 and 6	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2455	Titanium Alloy 5	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2456	Titanium Alloy 4	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2457	Titanium Alloy 3	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2458	Titanium Alloy 2	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2459	Titanium Alloy 7	N/A	Wyman-Gordon	Alloy	617/756-5111	/ /
2460	1055 Dry Ink Plus	Mixture	Xerox	Copy Machines	800-828-6571	03/15/90
2461	5018/5028/5034 Black Ink Toner	Mixture	Xerox	Toner	800-828-6571	12/15/86
2462	Photoreceptor 1065 - 5090	Polyester film	Xerox	Copy machine	800-828-6571	09/13/90
2463	Fuser Lubricant	Polydimethylsiloxane	Xerox	Copy machine oil	800-828-6571	11/07/90
2464	1065/5046/5065 Dry Ink	Styrene/butadiene copolymer	Xerox	Copy Machine Ink	800-828-6571	04/26/90
2465	1005/6500 Cyan Developer	Steel Powder	Xerox	Copy Machines	800-828-6571	03/27/90
2466	Developer 1065- 5065	Steel Powder	Xerox	Copy Machine	800-828-6571	09/26/90
2467	6500 Cyan Toner 1005 Dry Ink	Styrene/acrylate polymer	Xerox	Copy Machines	800-828-6571	04/15/85
2468	1005 Magenta Developer	Steel Powder	Xerox	Copy Machines	800-828-6571	03/29/90
2469	5090 Developer	Steel powder	Xerox	Copy Machines	800-828-6571	03/28/90
2470	1005/6500 Yellow Developer	Nickel Powder	Xerox	Copy Machines	800-828-6571	03/27/90
2471	Photoreceptor 1020-5052	Aluminum Drum	Xerox	Copy Machines	800-828-6571	02/20/90
2472	Xerox Cleaning Solvent	1,1,1, Trichloroethane	Xerox	Copy Machines	800-828-6571	11/20/87
2473	6500 Yellow Toner	Styrene/acrylate polymer	Xerox	Copy Machines	800-828-6571	04/04/90

2474	1005 Magenta Dry Ink	Styrene/acrylate polymer	Xerox	Copy Machines	800-828-6571	04/04/90
2475	5090 Dry Ink	Styrene/butadiene copolymer	Xerox	Copy Machines	800-828-6571	04/04/90
2476	Photoreceptor	Nickel belt	Xerox	Copy Machines	800-828-6571	02/20/90
2477	Developer 7080-9950	NI Zn ferrite powder	Xerox	Copy Machines	800-828-6571	03/27/90
2478	Dry Ink 8200-9950	Styrene/acrylate polymer	Xerox	Copy Machines	800-828-6571	03/15/90
2479	Xerox Fuser Agent	Organo-Polydimthylsiloxane	Xerox	Copy Machines	800-828-6571	04/25/90
2480	1075/1090 Dry Ink, Toner	Thermoplastic Powder	Xerox Corporation	Toner/Ink	800-828-6571	04/10/90
2481	1075/1090/4050 Developer	Mixture	Xerox Corporation	Developer	800-828-6571	03/27/90
2482	1065 Developer	Mixture	Xerox Corporation	Copy Machine	800-828-6571	05/25/90
2483	Zimmerman Lacquer Thinner	Toluene 30-60%	Zimmerman	Thinner		03/18/88
2484	Liquid A Steam/Pressure Cleane	Water 89%, Na Metasilicate 7%	Zobrist	Cleaner	303/343-4325	03/07/90
2485	Zolatone Low Odor Multicolor	Petroleum Naphtha	Zolatone	Coatings,resins	213/269-9231	01/17/89

APPENDIX E
SCOPE OF WORK

This appendix contains the Scope of Work for this project.

SCOPE OF WORK
FOR
ENVIRONMENTAL BASELINE STUDY
AT
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT
DELIVERY ORDER NUMBER ______
CONTRACT NUMBER DACW45-90-D-0008

December 1990

1. GENERAL STATEMENT OF SERVICES.

1.1. Background. Army Regulation 200-1 requires that an Environmental Baseline Study (EBS) be performed for all Army real properties undergoing transfer. The AE will be required to identify, describe and evaluate potential environmental liabilities associated with Stratford Army Engine Plant (SAEP). SAEP is a Government-owned Contractor-operated (GOCO) installation. The Contractor, Textron Lycoming Corporation, operates under a facilities contract with the U.S. Army Aviation Systems Command (AVSCOM). Textron primarily manufactures turbine engines for the Department of the Army and for commercial aircraft. All significant production operation at SAEP are currently active. The U.S. Army Corps of Engineers, Omaha District (CEMRO), on behalf of AVSCOM, is contracting for the required work.

1.2. Location. SAEP is an installation covering approximately 115 acres in the northeast corner of Fairfield County, Connecticut. SAEP is within the city limits of Stratford, approximately 2 miles south of Interstate Highway 95.

1.3. Environmental Baseline Study. An EBS is a comprehensive evaluation of the existing facility and environmental conditions, particularly regarding environmental contamination and similar environmental hazards, which is conducted for real property for which a transaction is proposed. The EBS is intended to develop the minimum amount of information required to assess the potential environmental liabilities associated with the property transaction so that the Army proponent can be informed of any environmental contamination or other environmental hazards associated with the property, consider potential significant adverse impacts on the community or environment, and determine potential environmental and financial liabilities related to the real property transaction. Once these risks are known and presented to the decision maker, the Army proponent can choose to proceed or discontinue the transaction.

1.3.1. EBS Property Categories. Properties evaluated under the EBS process are assigned to one of three categories as follows:

1.3.1.1. Type I Property. Property where there is little potential for environmental contamination or disruption from past, present, or proposed activities.

1.3.1.2. Type II Property. Property where there is some potential for environmental contamination or disruption from past, present, or proposed activities.

1.3.1.3. Type III Property. Property where there is known potential for environmental contamination or disruption from past, present, or proposed activities.

1.3.2. SAEP Status. It has been determined that there is known potential for environmental contamination or disruption from past, present, or proposed activities at certain units on the SAEP installation. Therefore, the SAEP site is considered a Type III property. The AE is not required to make this determination. A preliminary definition of the environmental liabilities associated with the site will be made under this Delivery Order by performing the first two EBS phases; Scope Definition and Site Survey.

2. **OBJECTIVE.** The objective of this SOW is for the AE to prepare an EBS Scoping and Site Survey Report which will provide a preliminary evaluation and documentation of all possible environmental contamination and/or disruption from past or present activities associated with the environmental condition of the SAEP property proposed for transfer.

3. **DETAILED DESCRIPTION OF SERVICES.**

3.1. General Requirements. All work performed by the AE shall, so far as possible, be designed and implemented in a manner which compliments earlier investigations and shall conform to the requirements of this SOW and conform to the format outlined in AR 200-1, Appendix B, attached. The AE must follow the format established in AR 200-1, Appendix B. Failure to comply with this requirement will result in review delays and possible reformatting and resubmission of the report. The AE shall perform and present a complete EBS Scoping and Site Survey Report as applied to the SAEP installation. All work shall be performed under the general supervision of a registered Professional Engineer.

3.2. Detailed Requirements. The Contractor shall collect, review and summarize the data necessary to prepare the EBS Scoping and Site Survey Report. Development of new information is not required under this phase of work. The work shall be performed as follows:

3.2.1. (Task AK-1) - Visual Site Inspection and Review Existing Data. The AE shall perform a visual inspection of the site, review the records, reports and other data provided by the Contracting Officer and the facility, or made available to the AE from sources such as public records, the USEPA, State Regulators, State or Federal Geological Survey, and from interviews with facility personnel who have knowledge of past site activities.

3.2.1.1. Title and Land Use Records. The AE shall review the chain of ownership and land use back as far as the 1920's when it is suggested that the land was first used for industrial purposes. The AE shall also review and provide a description of neighboring properties.

3.2.1.2. Aerial Photography. Aerial photography/imagery of the SAEP from the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is already available. As part of the data review, the AE shall review the photography/imagery for evidence of utilization of the land. The AE shall also gather any other available aerial photography of the site that would provide evidence of the utilization of the land. Information suggests that the land was first used for industrial purposes during the 1920's. From these photos the AE shall evaluate and document the history of the SAEP. The AE shall correlate the photographs with other data reviewed and verify or not verify any interpretations. The evaluations shall be incorporated into the EBS Scoping and Survey Report in the format specified in AR 200-1, Appendix B.

3.2.1.3. Drawings. The AE shall review existing facility engineering drawings available from SAEP that are pertinent to operations and environmental practices to determine possible locations of past or present contamination. For estimating purposes we anticipate the review of 80 drawings requiring one hour each.

3.2.1.4. Interviews. Working with Textron Lycoming, the AE shall obtain the names and addresses of employees or others (past and present) who would likely have knowledge of environmental practices or procedures at the site or surrounding properties. For estimating purposes, we anticipate 30 interviews of one hour each.

3.2.2. (Task AK-2) Prepare EBS Scoping and Site Survey Report. The AE shall incorporate the data reviewed under Task 1 in order to identify and evaluate all known or identifiable potential sources of contamination or environmental disruption. The EBS Scoping and Site Survey Report shall summarize geographical, historical and operational information. The AE shall provide a site description which includes location, ownership, topography, geology, hydrology (both ground water and tidal effects), meteorology, land use, landfill operations, waste type(s), estimates of waste volume, synopsis of findings and results of previous investigations and other pertinent details. The description shall also include historical events of concern such as chemical storage and disposal practices, dates of operation, design and construction information, summaries of past permits (by permit type), enforcement action and subsequent outcome for each of the sites, results and findings of previous studies and a "quality assurance" evaluation of the existing data in order to estimate its reliability. This report shall also provide the basis for future sampling, if recommended, and the technical justification where no sampling is deemed necessary. The AE shall include a list of waste management units and at SAEP that warrant further study, if any, and a description of the kind of study necessary. The report shall be prepared utilizing the following guidance:

3.2.2.1. EBS Scope Definition Phase. The objective of the scope definition portion of the EBS Scoping and Site Survey Report is to describe the following:

a. Purpose. Describe the EBS process and the magnitude of EBS envisioned for this project.

b. Property Transaction Type. Describe the type and extent of the real property transaction.

c. Property Category. Describe the property category.

d. Parties. Identify the parties to the transaction.

e. Proposed Use(s). Summarize the proposed and potential uses of the property.

f. Restrictions. List all existing and potential legal restrictions on the future uses of the property.

3.2.2.2. EBS Survey Phase. The objective of the survey portion of the EBS Scoping and Site Survey Report is to generally describe the environmental setting and to identify and evaluate all subject areas of concern. This will consist of an analysis of existing information and the results of the visual site inspection performed under Task AK-1. The following items must be addressed:

a. Environmental Setting. The general description, location, physical, historical and environmental framework of the property shall be described. Special conditions relating to the property, such as inclusion in public or SAEP planning districts shall be included. Describe the potential and actual environmental contamination based upon existing information and reports and the visual site inspection. Contamination of the property and of buildings and structures will be evaluated.

b. Analysis of Site Conditions. Identify areas of risk including, but not necessarily limited to, all existing and former sites involved in generating, transporting, storing, treating, or disposing of hazardous materials/substances/wastes, wastewaters, solid wastes, POL/fuels, explosives, ordnance, and other potential hazards, such as excessive noise, asbestos, or radon gas. Typical locations to be surveyed include industrial operation, maintenance activities, laboratories, storage facilities, burning grounds, impact areas, landfills, incinerators, treatment plant, UST's, and former POL or hazardous substance spill sites. Environmentally "sensitive" areas, such as wetlands or tidal marshes, shall also be identified and evaluated.

c. Population. Summarize the existing and potential human populations on the property and in the region.

d. Environmental Compliance. The AE shall assess and report upon the status of current environmental compliance. This includes assessment of compliance with and a list of existing Federal, State and local regulations, closure requirements if pollution control facilities would have to be abandoned due to the transaction, current regulatory status of the facility (including current or pending enforcement actions) and closure requirements for existing facilities or units. The AE shall review current and proposed property usage in order to determine if all operations which require permits actually have one, list and review pending Federal, State and local environmental legislation to determine likely future environmental compliance.

e. Site Identification. The AE shall identify all waste management units on the property of potential environmental concern and shall summarize the character of each site having an existing or potential environmental impact.

f. Exposure Assessment. The AE shall summarize the potential for exposing existing and/or future human populations to an adverse environmental impact within the scope of existing environmental laws and regulations.

3.2.2.3. The report shall also offer one of the following possible recommendations for each waste management unit at the SAEP:

(a) Proceed to confirmation Sampling Phase.

(b) Proceed to Investigative Sampling Phase.

(c) Proceed to Risk Assessment Phase.

3.2.2.4. For each waste management unit at the SAEP, the AE shall also prepare and include a one page (excluding map(s), photos) summary containing the following information:

(1) Unique Numerical Designation.
(2) Site Survey Summary.
  a. Individual Site Description.
  b. Site Type.
  c. Site Map. (Line sketch w/scale not greater than 1"=50").

d. Site History.
e. Site Operating Practices

(3) Materials/Wastes Used or Generated.

a. Material/Waste Summary.
b. Physical/Chemical/Toxicological Characteristics.
c. Migration and Dispersal Characteristics.
d. Potential for Impact.
e. Evidence of Impact.

4. **SUBMITTALS AND PRESENTATIONS.**

4.1. Format and Content. An EBS Scoping and Site Survey Report, thoroughly presenting all data, analysis, evaluations and recommendations, shall be prepared. All drawings shall be of engineering quality in drafted form with sufficient detail to show interrelations of major features on the installation site map. When drawings are required, data may be combined to reduce the number of drawings. The report shall consist of 8-1/2" x 11" pages with drawings folded, if necessary, to this size. A decimal paragraphing system shall be used, with each section and paragraph of the reports having a unique decimal designation. The report covers shall consist of durable 3-ring binders and shall hold pages firmly while allowing easy removal, addition, or replacement of pages. A report title page shall identify the AE, The Corps of Engineers, Omaha District, and the date. The AE identification shall not dominate the title page. Each page of draft reports shall be stamped "DRAFT". Each report shall identify the members and title of the AE's staff which had significant, specific input into the report's preparation or review. This Scope of Work shall be incorporated as an appendix in the draft report only. Submittals shall include incorporation of all previous review comments as well as a section describing the disposition of each comment. Disposition of comments submitted with the final report shall be separate from the report document.

4.2. Presentations. The AE shall make a presentation of work performed according to the schedule in paragraph 4.7. The presentation will consist of a summary of the work accomplished and anticipated followed by an open discussion among those present. The presentation shall be held at the Stratford Army Engine Plant in Stratford, Connecticut.

4.3. Minutes of Meetings. Following the presentation, the AE shall prepare and submit minutes of the meeting within 10 calendar days to the Contracting Officer.

4.4. Correspondence. The AE shall keep a record of each phone conversation and written correspondence affecting decisions relating to the performance of this contract. A summary of the phone conversations and written correspondence shall be submitted with the monthly progress report to the Contracting Officer.

4.5. Monthly Progress Report. The AE shall prepare and submit a monthly progress report describing the work performed since the previous report, work currently underway and work anticipated. The report shall state whether current work is on schedule. If the work is not on schedule, the AE shall state what actions are anticipated in order to get back on schedule. The report shall be submitted not later than the 10th day of each calendar month and shall discuss previous calendar month's activities. Three copies of the report shall be submitted to the Contracting Officer's Representative and they shall include all photographs and all video tapes taken the previous month. The AE shall hold progress meetings with Textron Lycoming and Government personnel while working on site. For estimating purposes, we anticipate three meetings per week of one hour each.

4.6. On-Site Coordination. The SAEP point of contact (POC) is Major Steve Brasier (203-358-2460). The AE shall keep him informed of day to day activities occurring on the facility. Where AE activities are likely to require coordination with SAEP's operating contractor, the AE shall notify the POC sufficiently ahead of time to allow for coordination activities to take place. Generally, with a few isolated exceptions, there are no restrictions as to where at SAEP the AE may access. All cameras, video equipment, and tape recorders must be registered with SAEP Security. An escort will be made available to the AE for site surveys and badges will be issued on a permanent basis for the duration of the surveys. Office space is available on SAEP for the AE's use.

4.7. Schedule of Deliverables and Review Meetings. Deliverables shall be submitted according to the following schedule. Notice to Proceed (NTP) shall within one week of receipt of the executed contract.

<u>Deliverable/Meeting</u>	<u>Date Required</u> (Days after NTP)
Draft EBS Scoping and Site Survey Report	- 45 calendar days
Government Review/Presentation Meeting	- 75 calendar days
Final EBS Scoping and Site Survey Report	- 90 calendar days
Work Order Completion Date	- 120 calendar days

4.8. Addresses for Submission of Deliverables. The AE shall furnish copies of the all reports as well as all technical submittals to each addressee listed on the attached mail out list in the quantities indicated. Submittals are due at each of the offices indicated not later than the close of business on the dates specified in Paragraph 4.7. Following each submittal, comments generated as a result of the Government's review shall be incorporated by the AE.

Mailout list for: Stratford Army Engine Plant Environmental Baseline Study Provide 1 copy of both the draft and final Scope Definition and Site Survey Report to each addressee

1. Commander
AVSCOM
ATTN: AMSAV-EMC (R. Matteuzzi)
4300 Goodfellow Blvd.
St. Louis, MO 63120-1789

2. Commander
AVSCOM
ATTN: SAVAI-F (A. Gibson)
4300 Goodfellow Blvd.
St. Louis, MO 63120-1789

3. Commander
DRPO
ATTN: DCMR NY-RTAC (Maj. S. Brasier)
550 Main St.
Stratford, CT 06497

4. Textron Lycoming-Stratford Division
ATTN: Business Strategies (J. Sherman)
550 Main St.
Stratford, CT 06497

5. Commander
AMC ISA
ATTN: AMXEN-C (A. McDermott)
Rock Island, IL 61299-7190

6. Commander
HQAMC
ATTN: AMCPD-PBA (B. Byrnes)
5001 Eisenhower Ave.
Alexandria, VA 22333-0001

7. Commander
TACOM
ATTN: AMSTA-XEM (P. Szymanski)
Warren, MI 48397-5000

8. Commander
TACOM
ATTN: AMCPM-GMC-CP (L. Lypeckyj)
Warren, MI 48397-5000

9. U.S. Army Corps Of Engineers
ATTN: CEMRO-ED-EA (J. Barrett)
215 N. 17th St.
Omaha, NE 68102

10. U.S. Army Corps of Engineers
ATTN: CEMRD-MD-HA
2945 South 132nd St.
Omaha, NE 68144

Appendix B
Environmental Baseline Study (EBS) Protocol

B–1. Introduction

a. An EBS is required by paragraph 12–5. An EBS is a comprehensive evaluation of the existing facility and environmental conditions, particularly regarding hazards and contamination, which is conducted on—

(1) Real property for which a transaction is proposed, whether or not the property is controlled by the Army.

(2) Army-controlled property for which an operating contract, facility contract, or third-party contract is being considered.

b. Typically, an EBS is conducted in a tiered approach and could comprise up to five phases. In some cases, such as the continuation of a pre-existing grazing lease that has had a minimal environmental impact, an EBS might only require—

(1) A short summary of the known environmental conditions of the site, and

(2) A visual site inspection prior to determining the potential risks associated with the site.

c. In all cases, the EBS is intended to develop the minimum amount of information required to assess the potential environmental liabilities associated with the property transaction. An EBS should be conducted early in the planning process of the property transaction planning process so that the Army proponent can—

(1) Be informed of any hazards or contamination associated with the property.

(2) Consider potential significant adverse impacts on the community or environment.

(3) Determine potential environmental liabilities related to the real property transaction.

B–2. Purpose

The purpose of an EBS is to determine the Army's potential liabilities associated with the environmental condition of the proposed property transaction. Once such risks are known, the proponent can choose to proceed or choose to discontinue the property transaction.

B–3. Property and transaction definitions

a. Real property. Land; present possessory interests in land; structures, fixtures, and other improvements on land; surface waters and groundwater within the boundaries of the land; other interests in the land; and future interests in land, in the United States, its territories and possessions.

(1) *Type I property.* Property where little potential exists for environmental contamination or disruption from past, present, or proposed activities. Typically, this includes sites in locations such as housing, administrative, or recreational areas where no hazardous materials were known to be stored or used. However, because of the potential for environmental contamination at these properties from such things as leaking underground storage tanks, few properties should be classified as type I. At the conclusion of the survey phase (para B–7), the Army proponent may decide that no further study is indicated, and may proceed to draft the EBS report.

(2) *Type II property.* Property where some potential exists for environmental contamination or disruption from past, present, or proposed activities. This potential may be due to the past historical usage of the property or to its proximity to critical areas such as a wildlife habitat or a sole source aquifer. When any doubt exists about a type I property, it should be redesignated as a type II property. At the conclusion of the survey phase (para B–7), the Army proponent may decide that no further study is necessary, and that little or no potential exists for environmental contamination or disruption from past, present, or proposed activities. In this case, the property should be redesignated to the type I category, and the EBS report should be drafted.

(3) *Type III property.* Property with known environmental contamination or disruption from past or present activities

b. Transactions.

(1) *Real property transaction.* Any acquisition, granting of use, or disposal of real property which includes but is not limited to: a sale or disposal action; a temporary use (e.g., an easement or right-of-way) regardless of the proposed duration; an exchange; an interservice support agreement; a transfer of real property to or from another DOD or other Federal agency; a real property transfer, disposal, or other action outside the Army that requires an EA; the granting of a lease, license, permit, or renewal thereof. Also, an operating contract, a facility contract, or a third-party contract concerning the use of Army-controlled property.

(2) *Present possessory.* Real property that is controlled by the DA.

(3) *Army proponent.* The lowest level decisionmaker, i.e., the Army unit, element, or organization responsible for initiating or carrying out the proposed action.

(4) *Transaction proponent.* The unit, element, or organization, other than the Army, responsible for initiating or carrying out the proposed action.

c. Environmental disruption. The results of actions that *significantly affect the environment*, as defined in AR 200–2. Such results would include but not be limited to encroachment on endangered species or habitat, damage to other ecologically sensitive areas, or degradation of water quality.

B–4. Assumptions

a. Compliance. An EBS is required for compliance with paragraph 12–5. The EBS protocol is applicable to the U.S. Army (all active, semi-active, and inactive installations), USAR (all installations and activities), and ARNG (all installations, activities, and sites supported with federally appropriated funds), in the United States, its territories, and possessions. The EBS protocol is not applicable to the nonmilitary civil works activities of USACE. Transactions covered by paragraph 12–5 include transfers as well as grants, leases, easements, and other tenancy arrangements, whether within the Army where the current operations would or would not continue, or to/from other Federal agencies and the civilian sector. Consequently, this protocol was prepared to include as many real property transaction scenarios as possible. Only those portions of the protocol that are applicable to the particular proposed transaction or use need be carried out.

b. Environmental assessment/impact statement. In the case that the transaction requires an EBS and an EA or EIS, the EBS will be referenced in the *affected environment* portion of the EA or EIS. When the proposed transaction qualifies for a CX, as described in appendix A of AR 200–2, a separate EBS will be prepared prior to the REC and should be included along with the REC for review.

c. Environmental sampling. On Army-controlled property, any environmental sampling required for the sampling and investigative phases will be restricted to the installation area. Off-post sampling will be conducted only if a request to do so has been sent through the chain of command to HQDA (ENVR–E) WASH DC 20310–2600, and permission granted by DASA(ESOH).

d. Buildings, structures, and fixtures. Buildings, structures, and fixtures will be evaluated for their environmental regulatory compliance only. This would include determining the existence of building contamination. Only those physical plant deficiencies that could affect regulatory compliance will be addressed. This includes such matters as the inadequacy of treatment plant capacity or hazardous waste storage space. Nonregulatory deficiencies—such as leaking roofs, insufficient ventilation, or inadequate public utilities (for example, insufficient electrical service capacity)—will not be considered within the context of the EBS. However, because such matters can be very important, they should be determined separately by the Army proponent.

B–5. Procedure

An EBS may consist of five phases: scope definition, survey, sampling, and investigative and risk assessment. Following the survey phase, and at every phase thereafter, the Army proponent—even in the case that the non-Army party is preparing the EBS—must determine whether the existing information is adequate to assess the risks involved with the proposed property use.

a. Technical assistance. The Army proponent is encouraged to request technical assistance from the following organizations, which can provide advice on data collection and evaluation and on making determinations as to the adequacy of the information gathered in each phase of the study—

(1) Supporting USACE District, to assist with contracting for conducting the EBS.

(2) Commander, USAEHSC, Kingman Bldg, Fort Belvoir, VA 22060–5580, for evaluating natural and cultural resources.

(3) Commander, USAEHA, ATTN: HSHB–MO–B, Aberdeen Proving Ground 21010–5422, for evaluating natural and cultural resources.

(4) Commander, USATHAMA, ATTN: CETHA–EC–S, Aberdeen Proving Ground, MD 21010–5401, for investigating hazardous chemical contamination.

(5) USACE, Huntsville Division (CEHND–ED–PM), PO Box 1600, Huntsville, Alabama 35807–4301 for investigating explosives and unexploded ordnance.

b. Pre-existing information.

(1) The Army proponent should consult the USACE District, USAEHSC, or USAEHA to have pre-existing data evaluated for usefulness as part of the EBS where—

(a) A large amount of pre-existing environmental information exists, such as an active IRP project or environmental monitoring reports;

(b) The property is appropriately designated in the type I category.

(2) In other cases, all five phases must be completed.

(3) This evaluation process is illustrated in figure B–1.

c. Performing the EBS. The real property transaction proponent must perform the EBS (para B–3), unless Army funding has been provided (para 12–5*e*(2)). The installation's real estate office must ensure that the EBS is prepared per the requirements of this protocol. Coordination with the organizations listed in B–5*a*(1), (2), or (3) is recommended. Assistance, review, and signature will be requested from the installation environmental officer.

B–6. Scope definition phase

a. Purpose. The purpose of the scope definition phase is to outline the type and extent of the real property transactions being considered and initially define the extent of the EBS required. Typically, an EBS is conducted in a tiered approach and could consist of up to five phases if the proposed property transaction warrants such detail. This phase of the EBS is critical, as it will determine which phases need to be conducted prior to assessing the risks involved with the proposed transfer. In some cases all five phases of the protocol must be conducted; for example, the transfer of an Army industrial site, with suspected contamination, to the civilian sector for unrestricted future use. In other cases it might only be necessary to summarize the existing environmental information and conduct a visual site inspection of the property site; for example, the continuation of an existing agricultural lease that has had a minimal environmental impact. In all cases, the EBS is intended to develop the minimum amount of information required to assess the potential environmental liabilities associated with the property transaction.

b. Real property transaction type. Describe the real property, property type (see definition in para B–3), and the proposed duration of use that are subject to the transaction.

c. Property category. Define the property category (type I, II, or III) based on such information as prior knowledge and historical records. Where any uncertainty exists regarding the potential for environmental contamination or disruption, the property should be classified as type II.

d. Parties. Identify the Army proponent and the other party or parties to the transaction, and state which party initiated the transaction.

e. Proposed use(s) Summarize the proposed and potential future uses.

f. Restrictions. List any existing or potential restrictions on the future uses of the property.

g. Remediation responsibilities. Define the primary responsible party for any potentially required remediation.

B–7. Survey phase

a. Environmental setting. The purpose of the survey phase is to generally describe the environmental setting and to identify and evaluate all subject areas concerned.

(1) *Environmental contamination.* This phase should determine the existence of, or potential for, environmental contamination. The environmental contamination analysis will address not only the environment (land, surface waters, and groundwater), but also the buildings, structures, and facilities on the land. In addition, a report on the status of current environmental regulatory compliance will be provided. If no actual or potential contamination or disruption exists, the EBS need not be extended past this phase.

(2) *Additional investigation.* Where actual or potential environmental contamination or disruption exists, this phase must determine whether any additional investigation is warranted prior to the risk assessment phase. For sites where an extensive amount of information exists, such as a completed IRP project, the remaining phases of the study (para B–5*b*) may not have to be completed.

(3) *Analysis.* Typically, the survey phase will consist of an analysis of existing information along with a visual site inspection of potential contamination sources. No new information should need to be developed to complete the survey phase.

(a) Evaluation areas. Areas requiring evaluation include, but are not limited to, all existing and former sites involved in generating, transporting, storing, treating, or disposing of hazardous materials/substances/wastes, wastewaters, solid wastes, POL/fuels, explosives, ordnance, and other potential hazards, such as excessive noise, asbestos, or radon gas.

(b) Typical locations. Typical locations to be surveyed include industrial operations, maintenance activities, laboratories, storage facilities, burning grounds, impact areas, landfills, incinerator treatment plants, USTs, and former oil or hazardous substance spill sites.

(c) Other areas. Other matters requiring evaluation include but are not limited to: forests and woodlands, fish and wildlife populations and habitat, threatened and endangered species, soils and vegetation, A&G uses, prime and unique farmland, native prairies and grasslands, surface water and groundwater supplies and quality, wetlands and flood plains, outdoor recreation resources, and cultural and historical resources.

(4) *Simple transactions.* For simple transactions, such as the continuation of existing agricultural leases, it may be necessary to conduct only the survey phase. This must be examined for each specific situation, as even a simple transaction could pose significant liabilities. For example, agricultural leases could result in soil and groundwater contamination of Army property due to improper use of pesticides and herbicides. Grazing leases could result in claims against the Army in the event that the cattle grazed on contaminated land.

b. Environmental setting. This element establishes the environmental framework for the subject property and its vicinity. This information is necessary for investigating the potential migration pathways of contaminants, evaluating the potentially exposed human populations, determining which environmental media may require additional sampling, and determining whether the potential exists for environmental disruption. Sources for this information include IRP documents, installation assessments, installation or programmatic EA/EISs, installation master and mobilization plans, regulatory permit applications, and reports prepared by other agencies such as USAEHA, USATHAMA, U.S. Geological Survey, U.S. Soil Conservation Service, and State, regional, and local planning organizations.

(1) *General information.* Special conditions relating to the property, such as inclusion in a public planning district, proximity to a national wilderness area, or other Army or non-Army jurisdictional limitations on real property uses.

(2) *Property information.* Background information that includes a description of the physical and environmental framework of the property. This information should be obtained primarily from a review of existing documentation, which should be referenced whenever possible.

(a) History. Description of past and present activities on/in the real property. Include any data on past and present generation of hazardous substances or wastes.

(b) Location. A map should show the subject property in its geographical context. A scale of 1:24,000 is suggested.

(c) Physiography/surface hydrology. Topography, flood plain and wetland locations, low and minimum receiving stream flow, water supply capabilities, and flood potential of existing and proposed use.

(d) Soils. Type, depth, erosion, and contaminant migration potentials.

(e) Geology. Summary of the geology of the region and the subject property, emphasizing the potential for migration of contaminants.

(f) Hydrogeology. Depth to uppermost aquifer, ground water quality, rate and direction of flow, water supply capabilities, potential for contaminant migration, and potential for contaminating deeper aquifers.

(g) Meteorology. Precipitation and evaporation rates, prevailing wind speed and direction, temperatures.

(h) Contaminated structures, buildings, or fixtures. An identification of the structure and the kind of contamination potential, for example, asbestos, radon, PCB transformers, pesticides/rodenticides/herbicides, chemical agents, explosives.

(i) UXO. Description includes types, locations, and amounts.

(j) Land use patterns. Residential, commercial, industrial, agricultural, etc., compatibility of proposed use with existing neighboring usage.

(k) Noise. For Army-controlled property, the ICUZ contours. For non-Army property, an assessment of the ambient and, if applicable, the potential noise level contours of the proposed use and the possible impact of such noise on Army activities.

(l) Existing ecological baseline. Subject areas include but are not limited to those listed in *a*(3)*(c)* above.

(m) Miscellaneous. Any additional concerns specific to the property.

c. Population. This element summarizes the existing and potential human populations on the property and in the region. This information is needed to assess the potential for exposure to any contamination that might result from the proposed use of the property. Sources of this type of information include the installation master and mobilization plans; State, regional, and local planning agencies; and commercial demographic surveys. In very few cases are future populations on Army-controlled property known, (for example, stationing of a new infantry division) and must therefore be assumed, using reasonable, yet conservative procedures.

d. Environmental compliance. This element summarizes the status of compliance with existing environmental requirements, any closure requirements if pollution control facilities would have to be abandoned due to the transaction, and any anticipated future regulatory requirements. Sources of this information include the installation's environmental and spill contingency plans, regulatory agency inspection reports, discharge monitoring data, USAEHA environmental audits and program reviews, closure plans, and mobilization environmental exercises.

(1) *Current regulatory status.* Review existing conditions to determine any substantive or administrative violations of environmental regulations. Identify any current or pending enforcement actions.

(2) *Closure requirements.* Review existing facilities to determine necessary closure requirements for existing environmental permits.

(3) *Future regulatory status.* Review proposed property usage to determine future regulatory requirements.

e. Survey of sites of potential environmental concern. This element summarizes each site having an existing or potential environmental impact. Suggested sources of this information include IRP documents, RCRA facility assessment documents, solid waste management unit (SWMU) evaluations, treatment plant evaluations, permit applications, installation or programmatic EA/EISs, and installation spill contingency plans.

(1) Site survey summary.

(2) Individual site descriptions.

(a) Site type (for example, generation, storage, or disposal site).

(b) Site area and site map (maximum scale of 1 inch = 50 feet).

(c) History.

(d) Operating practices.

(3) Materials/wastes used or generated.

(a) Material/waste summary.

(b) Physical/chemical/toxicological characteristics.

(c) Migration and dispersal characteristics.

(d) Evidence of impact. Includes an evaluation of the adequacy of existing data to determine the potential for the presence or absence of contamination or impact.

f. Exposure assessment. Includes a summary of the potential for exposing existing and future human populations to an adverse environmental impact.

g. Summary of findings. All known and identifiable potential sources of contamination and environmental disruption, if any, should be identified and evaluated for their adverse environmental impact potential. This report should provide the basis, if applicable, for future sampling and the technical justification where no sampling beyond the existing data is deemed necessary. Recommendations should include a list of those sites or areas, if any, that should be studied further and a description of the kind of study necessary. The report should reach one of the following possible conclusions on all sites—

(1) *Risk assessment.* If no additional sampling beyond the existing data is necessary, due to the absence of significant pollution potential, then the risk assessment phase should be conducted.

(2) *Investigative.* If adequate data are available to determine the presence of contamination or disruption, but not its extent, then the investigative phase should be conducted.

(3) *Sampling.* If insufficient data are available to determine either the presence or the absence of contamination or disruption, then the sampling phase should be conducted.

(4) *EBS draft report.* If, at the conclusion of the survey phase, a type I property remains as originally categorized, no further study will be needed. Therefore, the EBS report may now be drafted.

B–8. Sampling phase

a. Purpose. The purpose of the sampling phase is to verify the presence or absence of environmental contamination or disruption. Appropriate sampling and analyses are conducted at all areas or sites identified in the survey phase for which additional data are needed in order to assess the risks involved with the property transfer. This sampling is not intended to determine the magnitude and extent of any contamination, but only confirm its presence or absence. Standard methodologies such as those listed in para B–13 should be employed. Following the sampling phase, the resulting data should be evaluated to determine the need for additional study. The outline at *b* below is provided for scoping purposes; however, a more detailed outline is not possible because of the site-specific nature of the sampling phase.

b. Functional elements of the sampling phase.

(1) Locations for sampling.

(2) Analytical parameters.

(3) Analytical methodology.

(4) Sampling methodology.

(5) QA/QC procedures.

(6) SOH plan.

(7) Decontamination procedures.

(8) Data evaluation procedures.

(9) Report preparation/presentation.

c. Report of findings. This report should include an account of the sampling recommended in the survey phase. A sufficient amount of sampling data should be presented for each site that would reasonably verify the presence or absence of contamination or impact. This report should provide the basis for any future investigation, as well as the technical justification where no further investigation is deemed necessary. The report should reach one of these two possible conclusions on all sites—

(1) *Risk assessment.* If no additional investigation is necessary due to the confirmed absence of impacts, then the risk assessment phase should be conducted.

(2) *Investigative.* If an adequate amount of data is available to determine the presence of an environmental impact, but not its extent, then the investigative phase should be conducted.

B–9. Investigative phase

a. Purpose. The purpose of the investigative phase is to determine the nature, magnitude, and extent of any environmental impacts. The appropriate study is conducted at all areas or sites identified in the sampling phase as requiring additional data. Standard methodologies such as those listed in para B–13 should be employed. The investigative phase should result in sufficient data to assess the risks associated with the proposed property transaction. A suggested outline for the investigative phase is presented below for scoping purposes. A more detailed outline is not possible because of the site-specific nature of this phase.

b. Functional elements of the investigative phase.

(1) Locations for sampling.

(2) Analytical parameters.

(3) Analytical methodology.

(4) Sampling methodology.

(5) Field testing methodology.

(6) QA/QC procedures.

(7) SOH plan.

(8) Decontamination procedures.

(9) Data evaluation procedures.

(10) Report preparation/presentation.

c. Report of findings. The investigation phase should result in sufficient information to determine the nature, magnitude, and extent of any environmental contamination or disruption. This should include, but not be limited to, defining the lateral and vertical extent of contamination, the magnitude of contamination present, the directions and rates of contaminant migration, and the magnitude and impacts of any environmental disruption. Following the investigative phase, enough information should be provided to adequately conduct the risk assessment phase.

B–10. Risk assessment phase

a. Purpose. The purpose of the risk assessment phase is to characterize the risks associated with the property transfer, when some potential for environmental contamination or disruption has been identified in a preceding phase of the study. This should include both human health and environmental or ecological risks. Standard risk assessment methodologies should be used wherever possible, such as those listed in para B–13 (for example, EPA methods for public health risk assessment and environmental impact assessment used for conducting EAs and EISs). In effect, the risk assessment phase is analogous to the environmental consequences section of an EIS. Occasionally, because of unique site considerations such as military-unique contaminants, the development of risk assessment methods for the subject real property may be necessary. Any assumptions required for the risk assessment process should be reasonable yet conservative. All human health risk assessments must be approved by HQDA (SGSP–SP), per the requirements of paragraph 1–16c(6).

b. Human health risk assessment.

(1) *Contamination assessment.*

(a) Contaminant identification. Determine the types and quantities of contaminants present at the site.

(b) Contaminant hazard identification. Determine the significance of those contaminants (that is, toxicity, migration potential, etc.). Select driver or indicator contaminants.

(2) *Exposure assessment.*

(a) Contaminant release analysis. Evaluate the release potential for each contaminant and identify each on-site release point and estimate the potential quantity of such release.

(b) Contaminant transport and fate analysis. Determine the extent and magnitude of those contaminants. Determine the potential exposure pathways. Evaluate the contaminants' physical/chemical properties.

(c) Exposed populations analysis. Identify, enumerate, and characterize those human population segments that might become exposed to the contaminants.

(d) Integrated exposure analysis. Determine individual, chemical-specific exposure assessments for each potential exposure route. Determine total exposure to contaminants from all routes.

(e) Uncertainty analysis. Analyze the uncertainties associated with the exposure assessment process. This includes such things as the assumed input variables (intake rates, migration characteristics, exposure pathways, contaminant release rates, etc.)

(3) *Public health assessment.*

(a) Toxicity analysis. Determine the toxicity of the contaminants.

(b) Intake analysis. Determine human intake rates.

(c) Uncertainty analysis. Analyze the uncertainties associated with the public health assessment process. This includes such items as the baseline toxicological data, extrapolation of animal studies data to human health effects, use of high-dose animal studies to model low-dose environmental exposure, and use of models for dose-adverse effects.

(4) *Risk characterization.* Determine the public health risks associated with the intakes: that is, what the likelihood is that humans will experience any of the various forms of toxicity associated with the site contamination. Summarize total risks associated with exposure to the site. (Social, economic, and political considerations are not included.)

c. Ecological risk assessment. Determining the impact of environmental disruptions on ecosystems is very difficult due to their natural variability and the incomplete data derived from investigations. No single set of risk assessment methods is universally applicable to all ecological risk assessment problems. The variations in types of stresses, receptors, ecological conditions, and available data require risk assessment methodology which can be adapted to site-specific conditions. The methodology summarized below provided for guidance only, and should be adapted for local conditions where necessary.

(1) *Hazard identification.* Evaluate site-specific data on environmentally disruptive factors. This would include environmental contamination as well as attributes such as a proposed change in land use and wildlife habitats.

(2) *Exposure assessment.* Identify the potential exposed populations and their distribution in the affected areas.

(3) *Ecological disruption assessment.* Determine the potential environmental or ecological disruption from the various stresses, commonly relying on modelling.

(4) *Risk characterization.* Determine the ecological risks associated with the exposures or disruptions; that is, what the likelihood is that an ecosystem will experience any degradation due to environmental contamination or disruption. Summarize total risks associated with exposure to the site, together with estimates of costs and duration of time needed for mitigation or remediation of the contamination or disruption from past, present, or proposed activities. (Social and political considerations are not included.)

d. Report of findings. At the conclusion of the risk assessment phase, sufficient information should exist to determine the potential public health and ecological risks associated with the proposed property transaction. This information should be presented in a final report that summarizes the findings of this phase.

B–11. EBS report

Following completion of the EBS, the entire EBS effort will be compiled in a single draft report. The EBS report format should follow the format of the EBS protocol.

a. Executive summary. The Army proponent will ensure that the EBS report contains an executive summary of all findings and recommendations resulting from each phase of the study. The summary will draw conclusions and provide recommendations on the acceptability of the proposed real property transaction. For a type I property, the summary will include the following statement: "The survey phase of this study has identified little or no potential for environmental contamination or disruption from past, present, or proposed activities."

b. Review process. The Army proponent will forward the draft EBS report along with the associated REC, EA, or EIS to the appropriate Army reviewing office. The reviewing office will use the EBS protocol section-by-section as guidance for determining the adequacy of the draft EBS.

(1) *Adequate EBS.* If the EBS is deemed adequate, the Army proponent will incorporate it by reference and provide a copy of the EBS executive summary within the associated final REC, EA, or EIS. The complete EBS will be preserved in the same files as the background materials that support the REC, EA, or EIS, and in the same location and together with the final REC, EA, or EIS. In addition, if the transaction is such that the Army retains possessory rights (for example, reverter clause, reservation of right to re-enter, outgrants, land use permits), copies of the complete EBS report will be preserved, at a minimum, in the Army proponent's office and in the Army real estate office that carried out the transaction.

(2) *Inadequate EBS.* If the EBS is deemed inadequate, the reviewing office will return it to the Army proponent for revision and resubmittal for review.

B–12. Modifications

Prior to conducting an EBS, the Army proponent should ensure that the methodology to be used complies with the guidance presented in this protocol. Requests to use a methodology outside the scope of this protocol should be submitted in writing through command channels to HQDA (ENVR-E) WASH DC 20310–2600 for approval prior to conducting the EBS.

B–13. References

A listing of suggested references is included below. This list should not be considered all-inclusive.

a. Army regulations.

(1) AR 200–2.

(2) AR 405–10.

(3) AR 405–80.

(4) AR 405–90.

b. USACERL publications.

(1) Environmental Review for Management Action (environmental audit protocol, draft technical report).

(2) Guidelines for Review of EA–EIS Documents, Technical Report N–92.

(3) Procedures for Environmental Impact Analysis and Planning, Technical Report N–130.

c. USAEHA publications.

(1) Environmental Operations Review Protocol.

(2) Environmental Sampling Guide, TG 155, July 1987.

(3) Water Quality Information Paper No. 32: Risk Analysis and the Development of Water Quality Criteria, September 1988.

d. EPA publications.

(1) Expanded Site Inspection, Transitional Guidance for FY 1988, Office of Solid Waste & Emergency Response (OSWER) Directive 9345.0–02 (USEPA, Office of Remedial Response (OERR), October 1987).

(2) Guidance on Feasibility Studies under CERCLA (EPA, OSWER, April 1985).

(3) Guidance on Remedial Investigations Under CERCLA, (EPA, OSWER, May 1985).

(4) Handbook, Ground Water, EPA–625/6–87–016 (EPA, Office of Research and Development (ORD), March 1987).

(5) Handbook for Sampling and Sample Preservation of Water and Wastewater, EPA–600/4–82–029 (EPA, ORD, September 1982).

(6) Methods for Chemical Analysis of Water and Wastes, EPA–600/4–79–020 (EPA, ORD, revised March 1983)

(7) Preliminary Assessment Guidance, FY 1988, OSWER Directive 9345.0–01, (EPA, OERR, January 1988).

(8) Preparation of Soil Sampling Protocol: Techniques and Strategies, EPA–600/4–83–020 (EPA, ORD May 1984).

(9) RCRA Ground Water Monitoring Technical Guidance Enforcement Document, OSWER Directive 9950.1 (EPA, OSWER, September 1986).

(10) RCRA Facility Assessment Guidance, Draft, (EPA, OSWER, October 1986).

(11) RCRA Facility Investigation Guidance, EPA 530/SW–87–001, (EPA, OSWER, March 1988).

(12) Sediment Sampling Quality Assurance Users Guide, EPA–600/4–85–048 (EPA, ORD, July 1985).

(13) Soil Sampling Quality Assurance User's Guide, EPA–600/4–84–043 (EPA, ORD, May 1984).

(14) Superfund Exposure Assessment Manual, EPA–540/1–88/001 (EPA, OERR, April 1988).

(15) Superfund Public Health Evaluation Manual, EPA 540/1–86–060 (EPA, OERR, December 1986).

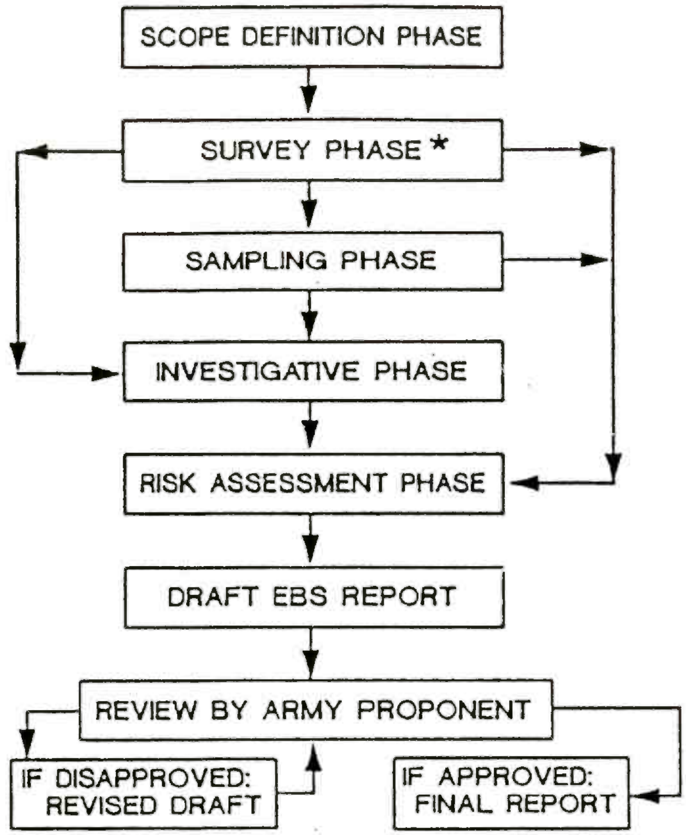
(16) Test Methods for Evaluation of Solid Waste, SW 846, 3d edition (EPA, OSWER, November 1986).

e. Miscellaneous.

(1) U.S. Department of Health and Human Services, Public Health Service, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

(2) Water Pollution Control Federation, Wastewater Sampling for Process and Quality Control, 1980.

ENVIRONMENTAL BASELINE STUDY (EBS) FLOW CHART



★ For a Type I property, the next step after the survey phase is the drafting of EBS Report.

Figure B–1. Environmental baseline study flow chart

APPENDIX F
COMMENTS ON DRAFT REPORT

This appendix contains a summary of the comments on the draft report that was received by WCC. The resolution of each comment is provided.

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
General	AMC	CHG: Report title and references from EBS to PAS	A
T.O.C.; p. ix	AVSCOM	DEL: 5.4.1.1 Discharge to Sanitary Sewer	A
T.O.C.; p. viii	AVSCOM	ADD: Figure 3-11 Monitoring Wells; Figure 4-12 Sanitary Sewers; Figure 4-13 ICUZ Zones	A
T.O.C.; p. viii	AVSCOM	ADD: Figure 4-3a Site Plan (1940 to 1943); Figure 4-6a Site Plan (1950 to 1960)	A
T.O.C.; p. ix	AVSCOM	DEL: Appendix E and Appendix F	A
p. ES-2; 1st par.	AVSCOM/TLS	CHG: Acreage to 76 improved land and 50 riparian rights (this will remove the causeway from being reported as riparian rights)	E The total site property is estimated at 125.5 acres. The intertidal flats area is about 48.5 acres, the causeway is about 2.1 acres, and the rest of the site is about 74.9 acres. Thus, the reported acreage has been changed to about 77 acres improved and about 49 acres riparian rights.
p. ES-3; 2nd bullet; last sentence	AVSCOM/TLS	REP: Avco manufactured radial engines in the 1950s for aircraft and developed and manufactured turbine engines in the 1960s and 1970s primarily for aircraft.	A
p. ES-3; 3rd bullet; 4th and 5th sentences	AVSCOM/TLS	REP: Avco also developed and manufactured aircraft, marine, and industrial engines. Avco merged with Textron in December 1985 and subsequently formed the Textron Lycoming Stratford Division (TLS).	A
p. ES-5; 4th bullet (bottom set of bullets)	AVSCOM/TLS	REP: Compliance action is complete on improper manifesting of hazardous waste (sludge) shipments to Canada and has been settled.	A
p. ES-7; 1st bullet	TLS	REP: Resolution of the compliance action on asbestos is pending and is planned for completion by July 1, 1991.	A

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LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT		ACTION[1]	
p. ES-7; 3rd bullet	TLS	REP:	...CAA amendments will require modifications to the present car-pooling program...	A	
p. ES-7; 4th bullet; 2nd sentence	AVSCOM/TLS	REP:	SAEP will phase out PCB and PCB-containing transformers through facility upgrade projects and/or as required by regulatory agencies.	A	
p. ES-7; last bullet, 1st sentence	AVSCOM/TLS	REP:	SAEP status of compliance with the Endangered Species Act (ESA) and/or the National Environmental Policy Act (NEPA) could not be determined.	A	
p. ES-8; 6th bullet, 2nd sentence	TLS	REP:	...however, it has reportedly (but not been verified) been used in the past for disposal of asbestos...	A	
p. ES-10; 1st bullet	TLS	ADD:	Reference to Figure 1.	A	
p. List of Acronyms	AVSCOM	ADD:	ESE and others found to be missing by WCC	A	
p. 1-2; 1st par.; last sentence	TLS	REP:	...with the property transaction at a minimum cost.	E	Approve, but this section of the report was rewritten to change from EBS to PAS. The comment is no longer applicable.
p. 1-3; 1st bullet; 1st sentence	TLS	REP:	...phase is to determine by analysis and sampling the nature...	E	Approve, but this section of the report was rewritten to change from EBS to PAS. The comment is no longer applicable.
p. 2-1; 2nd par.	AVSCOM/TLS	CHG:	Rewrite to explain findings, resolution, and include latest lastest calculation of acreage per comment ES-2	A	
p. 2-3; 4th bullet	TLS	REP:	...the property will likely not be permitted...	A	
p. 2-3; 5th bullet	AVSCOM	CHG:	Explain/reword	A	
p. 3-2; 3rd par.; 1st sentence	TLS	TYPO:	"was completed"	A	

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
p. 3-6; 1st par.; last sentence	TLS	REP: Precipitation that falls on SAEP is treated and drained into the Housatonic...	A
p. 3-13; 3rd par.	AVSCOM	ADD: Reference to Figure 3-11	A
p. 3-17; 2nd par.; 1st sentence	AVSCOM	REP: Two bird species that nest in...	A
p. 3-18; 4th par.; 3rd sentence	AVSCOM	TYPO: may be extripated "from" the area.	A
p. 3-20; 4th par.; 2nd sentence	AVSCOM	REP: The United States Army Materiel Command (AMC)...	A
p. 3-23; 4th par.; 2nd sentence	TLS	REP: ...Silver Sands State Park.	A
Table 3-1; sheet 1 of 4; 1st column; 4th row	AVSCOM	TYPO: "Stratford"	A
p. 4-1; Section 4.1.1	TLS	REP: Section 4.1.1 Sikorsky Aero Engineering Corporation/Sikorsky Aviation Corporation (1929 to 1939)	A
p. 4-4; 2nd par.	AVSCOM/TLS	REP: ...Stratford Army Engine Plant. In 1978, Avco was contracted by the Army to manufacture the AGT-1500 engine to power the Abrams tank. Avco also developed and manufactured aircraft, marine, and industrial engines.	A
p. 4-4; 3rd par.; 2nd sentence	TLS	REP: In 1986, a state-of-the-art cyanide/chromium treatment...	E Agree to change to ...a modern cyanide/chromium treatment... This study has not determined whether or not the CFD is "state-of-the-art."
p. 4-5; 3rd par.	TLS	REP: Industrial operations with potential environmental impact at SAEP may... ...raw and finished materials...	A
p. 4-6; 3rd par.; 1st sentence	AVSCOM/TLS	REP: ...and hydraulics fluids from manufacturing machinery are not major...	A

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
p. 4-7; 1st par.; last sentence	AVSCOM/TLS	REP: Processed water is discharged to the OATP and the spent...	A
p. 4-8; 1st par.; last sentence	AVSCOM/TLS	REP: Chlorinated solvent wastes from the vapor degreaser are removed...	A
p. 4-9; 5th par.; 3rd sentence	AVSCOM/TLS	DEL: ...dumped into a pit north of B-13	A
p. 4-12; 2nd par.; 3rd sentence	TLS	REP: ...dumped into tanks within a concrete pit...	A
p. 4-13; 4th par.; 2nd sentence	AVSCOM/TLS	REP: ...wastes containing oils, fuels, chlorinated oils, and emulsions...	A
p. 4-14; 4th par.; last sentence	AVSCOM	REP: ...floor drains that lead to the OATP.	A
p. 4-16; 3rd par.; 2nd sentence	TLS	REP: ...there are 8 outfalls from the plant...	A
p. 4-19; 4th par.; 1st sentence	TLS	REP: Treated effluent from CWTP has...	A
p. 4-21; 3rd par.; 1st sentence	TLS	REP: ...remove oil and grease from wastewater...	A
p. 4-22; 3rd par.; last sentence	TLS	REP: Sanitary sewers from plant buildings connect into a main discharge line which runs across the site and connects into a pump station owned and maintained by the Town of Stratford located in the north parking lot.	A
p. 4-22; 3rd par.	AVSCOM	ADD: Text explaining the town's sewer that enters the SAEP complex and integrates with the SAEP sanitary lines. Reference Figure 4-12, include the Town of Stratford Treatment System, note easements and construction years.	A
p. 4-22; 4th par.	TLS	DEL: References to sanitary waste permit and CEMO	A
p. 4-23; 3rd par.; 4th sentence	AVSCOM	REP: In 1981, a USACE project removed approximately 10,000 cubic yards of sludge for disposal...	A

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
p. 4-25; 1st par.; last sentence	AVSCOM	ADD: KVA of transformer and reference to Table 4-8.	A
p. 4-25; 3rd par.	AVSCOM	REP: SAEP will phase out PCB and PCB-containing transformers through facility upgrade projects and/or as required by regulatory agencies.	A
p. 4-27; 1st par.	AVSCOM	ADD: Reference to Figure 4-13.	A
p. 4-27; 2nd par.; last sentence	AVSCOM	ADD: Explain why information regarding types and quantities of explosives used and stored at SAEP is unknown.	A
p. 4-27; 5th par.; last sentence	TLS	REP: Radiological inspections are conducted by the NRC every 3 years and by the DOD on an unannounced, random basis.	A
Table 4-1	AVSCOM	CHG: Change table as per AVSCOM/TLS update	A
Table 4-3	AVSCOM/TLS	CHG: B-5 to B-19 and correct year both tanks at B-9 are unleaded gasoline B-39 to B-16	A A A
Table 4-4	AVSCOM	CHG: Change title to List of Inactive Underground...	A
Figure 4-3a	AVSCOM	ADD: Site Plan (1940 to 1943)	A
Figure 4-5	AVSCOM	CHG: Site Plan (1944 to 1949)	A
Figure 4-6a	AVSCOM	ADD: Site Plan (1950 to 1960)	A
Figure 4-8	AVSCOM	CHG: Site Plan (1961 to 1970)	A
Figure 4-10	AVSCOM	CHG: Site Plan (1971 to 1980)	A
Figure 4-10a	AVSCOM	ADD: Site Plan (1981 to 1991)	A
p. 5-3; 4th par.; last sentence	AVSCOM	DEL: Reference to Appendix E.	A

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
p. 5-4; 1st par.; 3rd sentence	AVSCOM	DEL: Sentence with reference to Appendix F.	A
p. 5-4; 3rd par.; last sentence	AVSCOM	DEL: Sentence with reference to Appendix E.	A
p. 5-6; 2nd par.; last sentence	TLS	REP: Compliance action is now complete on this issue.	A
p. 5-8; 4th bullet	AVSCOM	DEL: 4th bullet	A
p. 5-8; 5th bullet	AVSCOM	REP: Two 3,000 gallon gasoline tanks	A
p. 5-9; 3rd par.	AVSCOM	ADD: Text explaining applicability to SAEP	A
p. 5-11 and 5-12; Section 5.4.1.1	TLS	DEL: Delete section because it refers to CEMO	A
p. 5-12; 4th par.; last sentence	AVSCOM	ADD: Text explaining that outfall 008a no longer exists and the discharge from CDF is to CWTP.	A
p. 5-15; 1st bullet p. 5-16; 2nd bullet	AVSCOM	CHG: Change Outfall 008a to CDF	A
p. 5-16	AVSCOM	ADD: Quantities of chemicals detected in effluent (if or where known) and text explaining the severity.	A
p. 5-27; 3rd par.	AVSCOM	ADD: Reference to Figure 4-13.	A
Table 6-2; 1st sentence	AVSCOM	CHG: Correct acreage.	W Acreage given in table is correct.
p. 8-3; 2nd par.; 1st sentence	TLS	REP: ...landfill area including the possible disposal of asbestos containing material.	A
p. 8-7; 4th par.; 1st sentence	TLS	REP: This area includes the natural tidal stream where treated chemical waste water is discharged by permit into the Marine Basin.	A
p. 9-1; 1st par.	AVSCOM	CHG: Table 4-9 to 4-7; Table 4-10 to 4-9.	A

APPENDIX F
COMMENTS ON DRAFT REPORT

LOCATION OF TEXT IN DRAFT REPORT	SOURCE	COMMENT	ACTION[1]
p. 9-1; 1st par.; last sentence	AVSCOM	REP: ...; however, SAEP has replaced several transformers and will continue reduction as required.	A
p. A-3	AVSCOM	CHG: Caption for Photograph No. 7-4.	A
p. C-3; 1953	AVSCOM	REP: ...first flight of T-53 helicopter engine.	A
p. C-3; 1965	AVSCOM	REP: Development of AGT 1500...	A
p. C-3; 1978	AVSCOM	REP: 1944 ...shoreline extension. 1953 ...helicopter engine. 1965 Development of .... 1978 Avco wins M-1 Abrams tank engine contract. 1982 Beginning of Industrial Productivity Improvement/Industrial Resource Enhancement Program (IREP); easement granted to Town of Stratford for sewerline running across SAEP. 1988 Encapsulation of B-19.	A
Appendix E	TLS	DEL: Delete entire appendix and all references to it in the report.	A
Appendix F	TLS	DEL: Delete entire appendix and all references to it in the report.	A

1 A = comment approved and has been incorporated into final report
E = comment approved with exception as noted and incorporated into the final report
W = comment has been withdrawn