DEPARTMENT OF THE ARMY

UNITED STATES ARMY MATERIEL DEVELOPMENT

AND READINESS COMMAND

UNITED STATES ARMY TROOP SUPPORT AND AVIATION MATERIAL READINESS COMMAND

INSTALLATION ENVIRONMENTAL ASSESSMENT

FOR

AVCO LYCOMING STRATFORD ARMY ENGINE PLANT

JULY 1981

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ACKNOWLEDGEMENTS

Pat Mineo[1] and Bill Gillen[1] served as the points of contact for the US Army Dugway Proving Ground (DPG) environmental team. Personnel from AVCO Lycoming and Defense Contract Administration Services Management Area (DCASMA) - Bridgeport provided information and comments throughout the preparation of the assessment.

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SECTION A. INTRODUCTION

1. DESCRIPTION

a. General

(1) Background

The National Environmental Policy Act[1] (NEPA)[2] of 1969 requires that all federal agencies plan their actions to prevent or eliminate damage to the environment.

Chapter 2 of the Department of Army Regulation (AR) 200-2[3] implements NEPA. It requires preparation of an Installation Environment Assessment (IEA) for each Department of Army (DA) installation. This document represents the first IEA on Stratford Army Engine Plant (SAEP), Stratford, CT. The cut-off point for information in this edition is 29 April 1981.

The IEA is a summary of all facets of an installation which have environmental significance. It is intended to ensure that: 1) the environmental resources in and around the installation are identified, 2) installation activities are identified, and 3) the potential impacts of these activities on the resources are known. Actions which have an adverse effect are identified so that, if feasible, plans can be changed to minimize or eliminate adverse impacts.

(2) Summary Description of Stratford Army Engine Plant

(a) General

The SAEP (Figure A.1-1) is the largest government-owned, contractor-operated (GOCO) facility within the Department of the Army. The SAEP is under the military command of the US Army Troop Support and Aviation Material Readiness Command (TSARCOM) which is a subcommand of the US Army Materiel Development and Readiness Command (DARCOM) (Figure A.1-2). The contractor is AVCO Corporation, Lycoming Division. AVCO Lycoming Contracts are administered and supervised by Defense Contract Administration Services Management Area (DCASMA) - Bridgeport, a co-tenant with AVCO Lycoming in SAEP. The DCASMA is under the direction of the Commander, Defense Contract Administration Services Region (DCASR) - Boston which is one of the nine regional offices for the Defense Logistics Agency (DLA).

Command responsibility at SAEP is jointly shared by DLA, through the Bridgeport DCASMA, and DARCOM through TSARCOM. However, the Bridgeport DCASMA, DLA does not maintain close operational management, and TSARCOM does not maintain a military management staff at SAEP.

With insignificant exceptions, AVCO Lycoming is the source of potential environmental impacts at SAEP. Potential impacts, nevertheless, are the responsibility of the US Army who owns the facility. Thus, this IEA will concentrate on the operation of AVCO Lycoming.

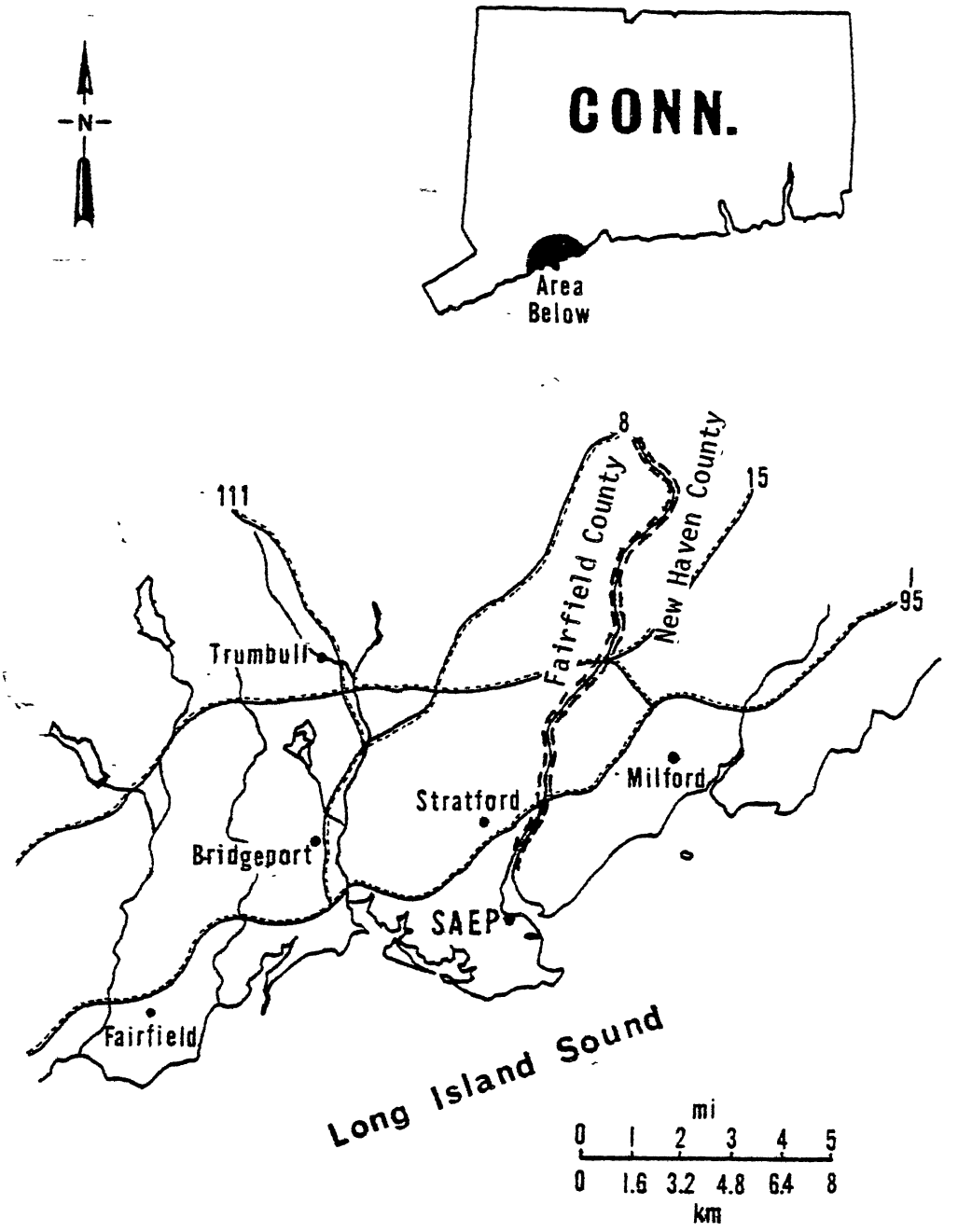
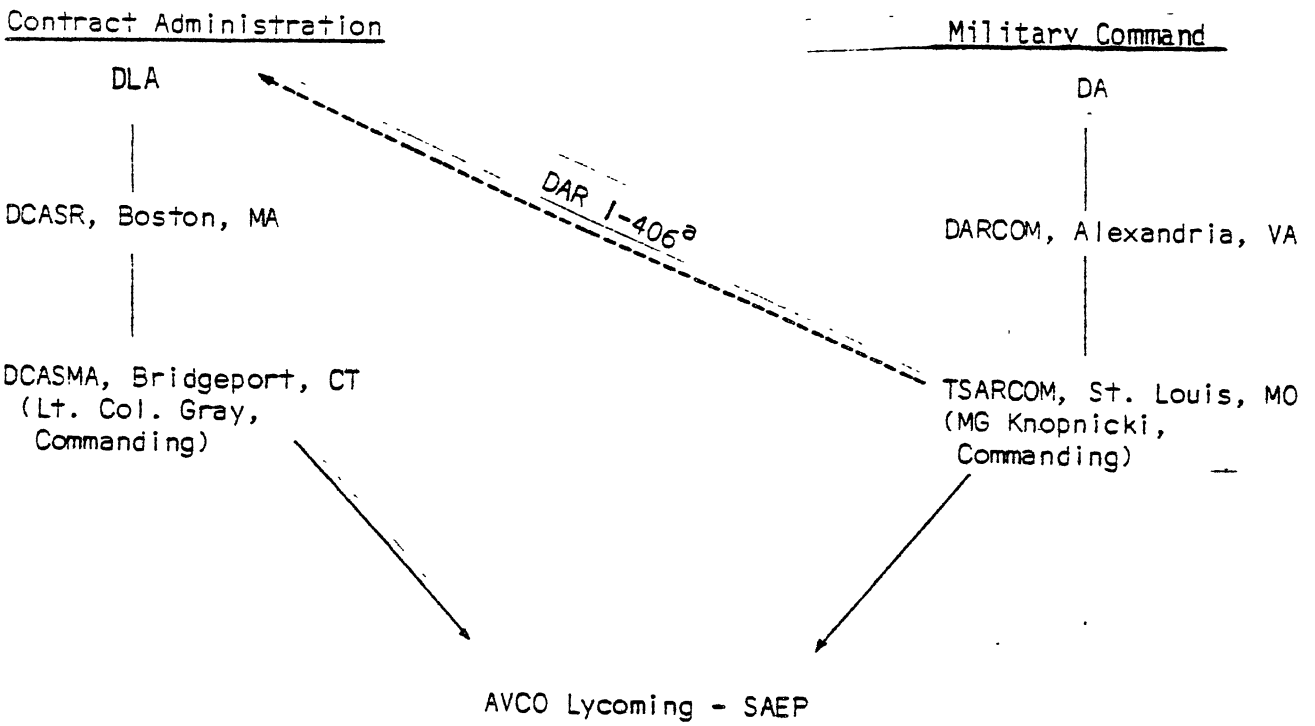


Figure A. 1-1. Location of Stratford Army Engine Plant in Connecticut



[a]Defense Acquisition Regulation I-406, July 76 and Updates 1 Aug 78 and 28 Aug 80.

Figure A.1-2. Organizational Chains Affecting Stratford Army Engine Plant.

The SAEP covers 47 hectares[4] including 16 hectares of riparian rights[5] adjacent to the mouth of the Housatonic River (Figure A.1-3)[6]. All land on the installation is improved (Figure A.1-4)[7], consisting of 48 buildings[8] and building extensions, paved roadways, and three major parking lots.

(b) Mission and Organization

The mission of AVCO Lycoming is to meet the contract requirements to produce, rennovate, repair and maintain the T55, the T53, and M1 gas turbine engines. Every effort is made to minimize the environmental impact of AVCO Lycoming activities without affecting the mission.

Approximately 4700 people are employed by AVCO Lycoming. This number is expected to expand over the next few years to accomodate an increase in orders for the M1 gas turbine engine. There is a high likelihood that work on the T55 and T53 gas turbine engines will be shifted elsewhere before the the M1 engine reaches its maximum production.

The organization of AVCO Lycoming is shown in Figure A.1-5[9]. The office of Engine Programs is the major office of concern for this IEA. The office includes separate program management offices for the T55, T53, and the M1 engines.

(c) History[10]

Construction of the facility began in 1929, as the Sikorsky Aeronautical Engineering Corporation. Subsequently, the Chance Vought Company took over as operator. During World War II, the US Government purchased the facility. In 1951, AVCO Lycoming occupied the facility, then owned by the US Air Force[8].

AVCO Lycoming commenced immediate production of nine-cylinder R-1820 engines. At the same time production of several major components for the J-47 jet engine also got under way. These programs were soon joined by the R-1300, a seven-cylinder radial engine, also produced under license agreement.

One year later, AVCO Lycoming was awarded a research and development contract calling for the development of a small gas turbine engine, the T53, specifically for helicopter applications. More than 16,700 T53 engines have been produced.

The T53 engines power the Bell UH-1 series "Huey" helicopter, the Bell AH-1 "HueyCobra" gunship helicopter, the Kaman HH-43 "Huskie" rescue helicopter and the Canadair CL-84 STOL tilt-wing aircraft, as well as the commercial Bell 204 and 205 transport helicopters. A turboprop version of the same engine powers the Grumman OV-1 "Mohawk" observation aircraft.

In 1954 AVCO Lycoming was awarded a second contract for development of a higher rated family of gas turbine engines, designated the T55 series. Main applications for the T55 are the Army's twin engine Boeing CH-47 "Chinook" transport and the single engine Bell Model 214A advanced

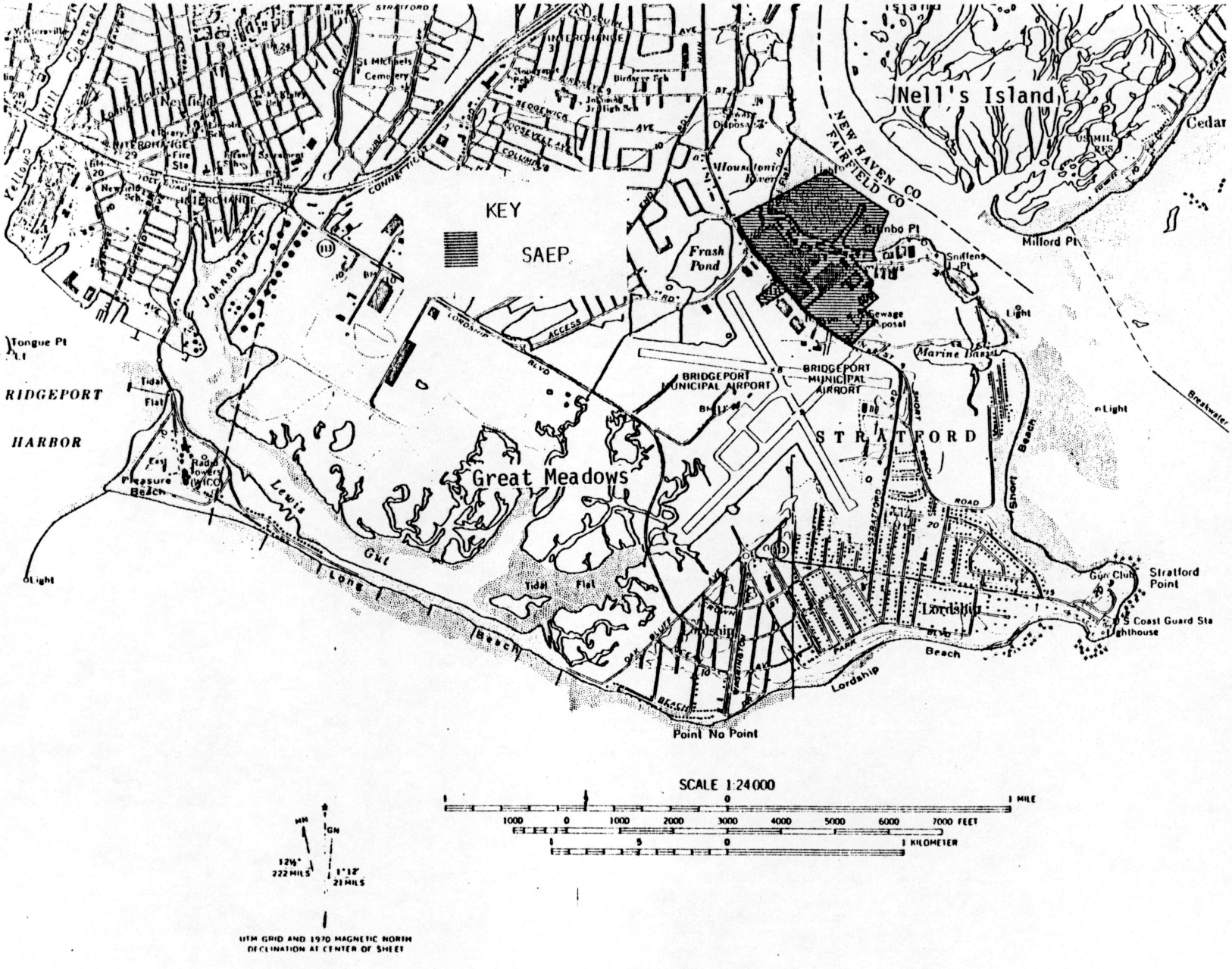


Figure A.1-3. The Location of Stratford Army Engine Plant on Stratford Point.

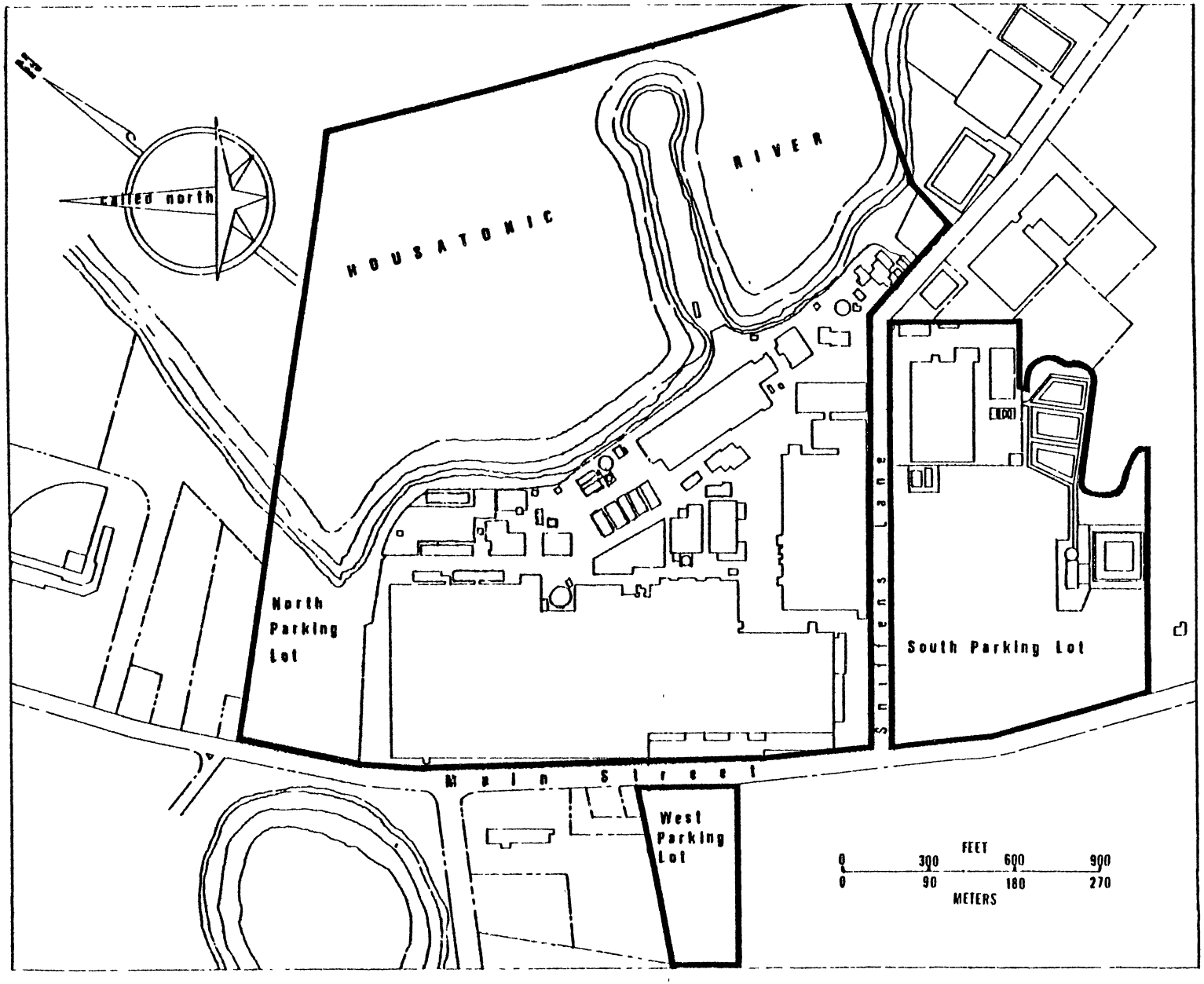


Figure A.I-4. Map of Stratford Army Engine Plant

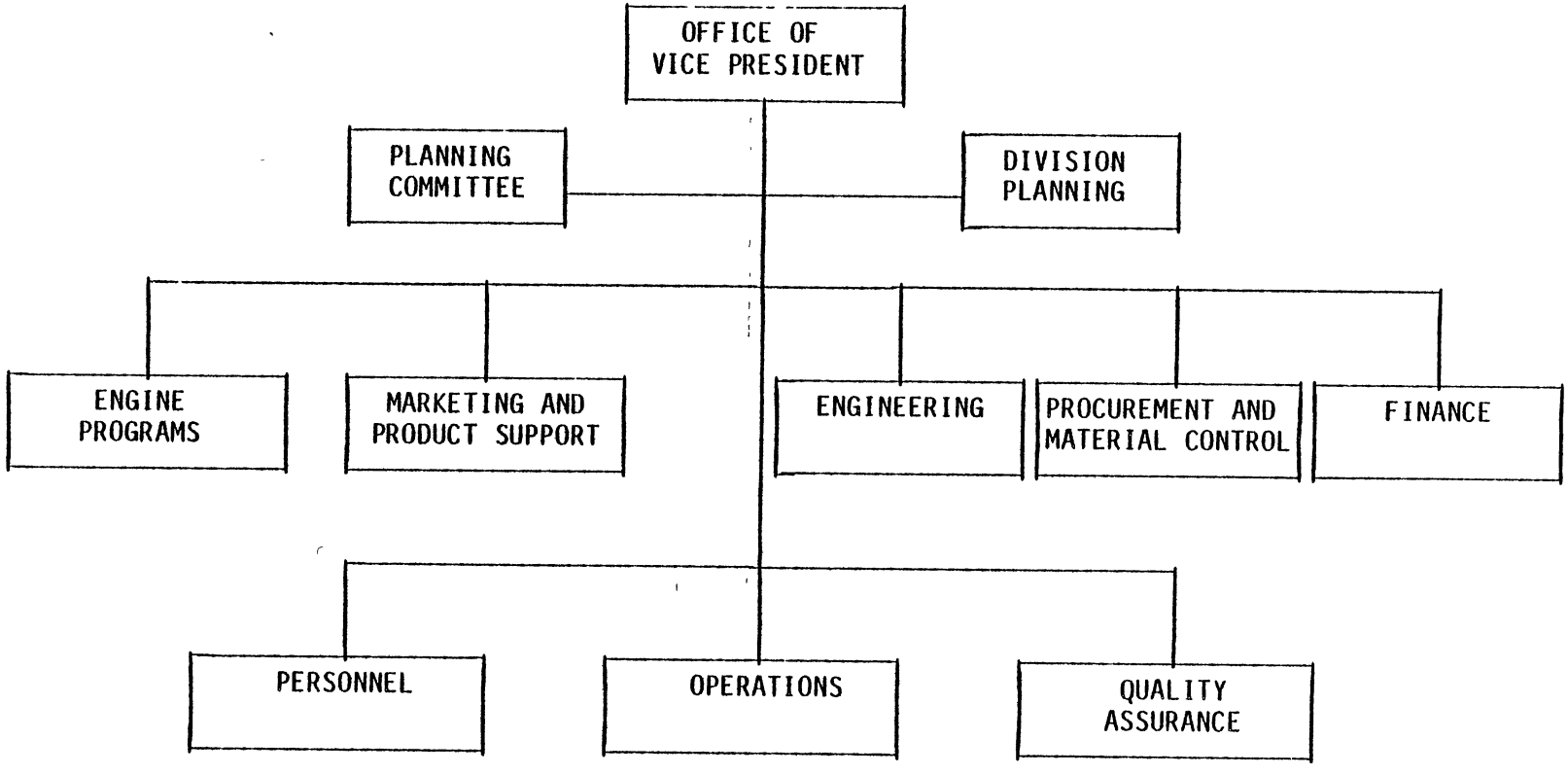


Figure A.1-5. Organization of AVCO Lycoming, Stratford

utility tactical transport helicopter. Over 2000 T55's have been produced. Advanced turboprop versions of both the T53 and T55 families of engines have also been made available.

In 1976 the facility was transferred from the US Air Force to the US Army (DARCOM) when it received its present name, "Stratford Army Engine Plant"[8].

In the same year AVCO Lycoming was awarded a third contract for development of a radically new, 1500 shaft-horsepower gas turbine engine for surface vehicles such as tanks. Designated the M1, this engine has a weight about one-half that of comparable diesels - with efficiencies comparable to the most modern diesel engine available. The main application of the M1 is the Army's new M1/Abrams main battle tank.

In 1977 SAEP was placed under the organization now known as TSARCOM[11].

In addition to fulfilling Army contracts, AVCO Lycoming markets a number of commercial engines. In fact, approximately 46 percent of the manufacturing effort of AVCO Lycoming is concerned with these commercial engines. AVCO Lycoming pays rent to the US Government on a semi-annual basis for utilization of facilities in connection with non-US Government and foreign military sales programs.

b. Description of the Vicinity of Stratford Army Engine Plant

(1) General

The SAEP is in a densely populated area. The area within a perimeter of 16 kilometers (km) from the boundary of SAEP (the vicinity) (Figure A.1-1) includes parts of two counties: Fairfield and New Haven.

The major urban areas are Fairfield, Bridgeport, Trumbull, Stratford, and Milford. The population of Stratford township is estimated at 52,000[12] and that of Fairfield County is estimated at 793,000[12], while that of New Haven County is estimated at 745,000[12].

(2) Transportation Facilities[8]

Major access routes for highway transportation, and their estimated distances from SAEP, are I-95 (3 km), CT Route 8, I-91 (24 km) and I-84 (32 km). Commercial transportation carriers are available in abundance.

The nearest air transportation facilities, and their estimated distances from SAEP, are the Bridgeport Sikorsky Memorial Airport (0.8 km - limited service), J.F.K. and LaGuardia Airports in New York (97 km - full service) and Bradley International Airport in Hartford, CT (113 km - full service).

The nearest railroad siding is 8 km from SAEP and is served by Conrail and Amtrack.

The nearest commercial waterway transportation facility is approximately 8 km from SAEP (Bridgeport Harbor). In the event of emergencies, or unusual circumstances, limited arrangements can be made for waterway transportation directly to SAEP.

(3) Topography[13]

The vicinity is in the New England Physiographic Province characterized by mostly hilly upland with altitudes mainly below 200 meters (m) and an irregular, rocky coast. Almost all of the land at SAEP is below 3 m mean sea level elevation and is protected from flooding by dikes and floodwalls[14] (refer to paragraph C.1).

2. ENVIRONMENTAL SETTING

a. Climate

Table A.2-1[15] summarizes the climate of the vicinity.

The most pronounced topographical effect is the land-sea breeze which is most prominent in the spring, summer and early fall. Precipitation is slightly heavier and temperatures slightly cooler than inland areas as a result of the sea-breeze which promotes good air mixing[16].

The SAEP is in an area subject to hurricanes. It has an intermediate frequency of tornadoes and an average of 2 days per year of hail[13].

b. Air Factors[16,17]

(1) Standards

Department of the Army installations are required by AR 200-1[18] to comply with the most stringent of all applicable Federal, State, local, and US Army regulations. The governing requirements for SAEP are those contained in the State of Connecticut Air Pollution Abatement regulations[19] and reinforced by the 1977 Clean Air Act Amendments, Public Law 95-95[20]. Table A.2-2[21] provides the federal ambient air quality standards. The state regulations slightly modify these standards in the case of specific air pollution generators.

(2) Background Air Quality

The SAEP is located in the Northeastern portion (Connecticut portion) of the New Jersey-New York-Connecticut Interstate Air Quality Control Region (AQCR). The Connecticut portion of this interstate AQCR is in "attainment" of the National Ambient Air Quality Standards (NAAQS) for total suspended particulates (TSP) and ozone. However, this region is listed as "cannot be classified or better than NAAQS" for nitrogen dioxide (NO_2) and carbon monoxide (CO) with sulfur dioxide (SO_2) listed in "attainment". It should be emphasized that this AQCR region is highly developed, and contains some of the most densely populated and industrialized cities of the country including New

remes for Stratford Army Engine Plant.

ative idity		WIND			TEMPERATURES (°C)							SUNRISE TO SUNSET						
					NORMAL			EXTREMES		NORMAL DEGREE DAYS BASE 13.4°C								
		Mean Wind m/sec	Prevailing Direction	Fastest Speed m/sec	Daily Maximum	Daily Minimum	Monthly	Highest	Lowest	Heating	Cooling	Mean Sky Cover, Tenths	Clear	Partly Cloudy	Cloudy	Thunder-storms	Heavy Fog Visibility 1/4 mile or less	MEAN NUMBER OF DAYS Average Station pressure[a]
62	66	5.8	NW	29.4	2.7	-4.7	-1.0	13.4	-20.5	1079	0	6.2	9	7	15	*[b]	1.2	1016.9
59	63	5.9	NW	28.0	3.2	-4.5	-0.6	15.1	-20.5	955	0	6.1	8	7	13	*	1.2	1016.9
59	62	5.8	NW	25.5	7.2	-0.6	0.4	21.1	-15.5	840	0	6.4	8	9	14	1	1.6	1016.3
53	59	5.7	N	24.2	13.6	4.6	9.1	30.0	-6.6	498	0	6.3	7	9	14	2	1.2	1013.8
60	67	5.1	E	22.0	19.2	9.9	14.6	44.4	-0.5	225	17	6.4	7	10	14	3	1.6	1014.4
63	71	4.5	SW	16.7	24.4	15.4	15.9	35.5	5.0	24	111	6.0	8	10	12	4	1.6	1016.3
61	69	4.3	SW	17.6	27.5	18.9	21.5	39.4	10.5	0	273	6.0	7	13	11	5	0.8	1014.9
62	71	4.4	SW	25.5	26.8	18.2	20.4	53.7	8.8	0	241	5.8	9	10	12	4	0.4	1017.1
63	73	4.8	NE	20.6	23.6	14.6	14.6	55.4	2.2	42	87	5.6	10	8	12	2	0.4	1017.1
61	69	5.1	NE	22.4	18.3	9.1	13.7	34.6	0.4	261	6	5.3	11	8	12	1	0.8	1018.0
62	70	5.5	NW	25.5	11.8	3.7	7.7	26.1	3.1	520	0	6.3	8	8	14	*	0.8	1017.2
63	68	5.7	NW	23.3	4.7	-2.7	1.0	13.4	18.8	967	0	6.2	9	7	15	*	0.8	1017.1
61	67	5.2	SW	29.4	9.3	6.8	11.0	39.4	-20.5	5461	390	6.1	101	106	158	21	12.0	1016.4

Table A.2-2. Primary and Secondary Ambient Air Quality Standards.

	Total Suspended Particulates ($\mu g/m^3$)	Sulfur Oxides ($\mu g/m^3$) (ppm)	Nitrogen Dioxide ($\mu g/m^3$) (ppm)	Carbon Monoxide ($\mu g/m^3$) (ppm)	Ozone ($\mu g/m^3$) (ppm)	Hydro-carbons ($\mu g/m^3$) (ppm)	Lead ($\mu g/m^3$)
US EPA Primary Standard		80 AAM 0.03 AAM		10 8HM 9 8HM			
	75 AAM 260 24HM	365 24HM 0.14 24HM	100 AAM 0.05 AAM	40 1HM 35 1HM	0.12 1HM 235 1HM	160 3HM 0.24 3HM	1.5 MAMCQ
US EPA Secondary Standard		60 AAM 0.02 AAM 260 24HM 0.1 24HM		10 8HM 9 8HM			
	60 AGM 150 24HM	1300 3HM 0.5 3HM	100 AAM 0.05 AAM	40 1HM 35 1HM	0.12 1HM 235 1HM	160 3HM 0.24 3HM	1.5 MAMCQ

Legend:

AAM: Annual arithmetic mean

AGM: Annual geometric mean

24HM: 24-hour maximum concentration not to be exceeded more than once per year

8HM: 8-hour maximum concentration not to be exceeded more than once per year

3HM: 3-hour maximum concentration not to be exceeded more than once per year

1HM: 1-hour maximum concentration not to be exceeded more than once per year

MAMCQ: Maximum arithmatic mean averaged over a calender quarter

York City and other highly urbanized regions in New Jersey and Connecticut. Total suspended particulates are generally higher when the wind is from the southwest[22]. Air quality generally has been improving over the last 10 years[22].

(3) Monitoring Network[5]

In 1978, Bridgeport, Stratford, and Milford each contained two high volume, TSP matter instruments. Two continuous SO_2 instruments were located in Bridgeport and one in Milford. Two NO_2 gas bubbler instruments were located in Bridgeport and one in Stratford. One CO instrument and one chemiluminescent ozone sampler were located in Bridgeport.

c. Water Factors[23]

(1) Surface Waters

The Housatonic River in the vicinity is presently classified as SC - suitable for recreational boating and industrial cooling with good aesthetic value. The goal adopted is SB - suitable for bathing, other recreational purposes, industrial cooling and shellfish harvesting for human consumption after depuration; excellent fish and wildlife habitat; good aesthetic value. Long Island Sound waters off Stratford point are classed as SB. Table A.2-3 identifies the standards that apply to these two classes.

It should be noted that the Housatonic River adjacent to SAEP is tidal, thus it can be expected to exhibit a salt wedge. As much as 40 percent of the average annual flow of the Housatonic occurs in the months of April and May[13]. The nearest flow rate and water quality monitoring station is 10 km upstream from the mouth of the Housatonic River. All standard physical/chemical parameters are measured[24].

(2) Ground Waters

The vicinity is underlain by consolidated-rock aquifier and some replenishment comes from perennial streams. Some encroachment of inferior water has been reported for some wells.

d. Background Noise and Odor Levels

Although Bridgeport Municipal Airport is adjacent to SAEP (Figure A.1-3), background noise levels are not a problem at SAEP. Background odor levels are not a problem at SAEP.

e. Natural Resources

(1) Habitats, Flora, and Fauna[25]

The vicinity lies in the Western Coastal Ecoregion; a seaboard region, generally lying within 8 km of the coast of western Long Island Sound. This region is characterized by coastlands, including extensive tidal marshes, sand beaches, and estuaries, by relatively level but rolling nearshore lands, and by locally rugged and rocky protrusions of upland extending to the coastline.

Table A.2-3. Water Quality Standards in the Vicinity.

Parameter	CLASS	
	SB	SC
Dissolved oxygen	Not less than 5.0 mg/ℓ at any time	Not less than 5 mg/ℓ for more than 6 hours during any 24-hour period and at no time less than 4 mg/ℓ.
Sludge deposits - solid refuse - floating solids, oils and grease - scum	None except for small amounts that may result from the discharge from a waste treatment facility providing appropriate treatment.	None except for small amounts that may result from the discharge from a waste treatment facility providing appropriate treatment.
Silt or sand deposits	None other than of natural origin except as may result from normal agricultural, road maintenance construction activity, or dredge material disposal provided all reasonable controls are used.	None other than of natural origin except as may result from normal agricultural, road maintenance construction activity, or dredge material disposal provided all reasonable controls are used.
Color and turbidity	A secchi disc shall be visible at a minimum of 1 meter.	None in such concentations that would impair any usages specifically assigned to this class.
Coliform bacteria per 100 ml	Not to exceed a median value of 700 and not more than 2300 in more than 10 percent of the samples.	Not to exceed an average in any 30-day period of 5000 nor exceed this value in more than 20 percent of the samples collected during the period.
Taste and odor	None in such concentrations that would impair any usages specifically assigned to this class and none that would cause taste and odor in edible fish or shellfish.	None in such concentrations that would impair any usages specifically assigned to this class and none that would cause taste and odor in edible fish or shellfish.
pH	6.8 to 8.5	6.8 to 8.5

Table A.2-3. Water Quality Standards in the Vicinity (cont'd).

Parameter	CLASS	
	SB	SC
Allowable temperature increase	None except where the increase will not exceed the recommended limit on the most sensitive receiving water use and in no case exceed 83°F or in any case raise the normal temperature of the receiving water more than 4°F. During the period including Jul, Aug, and Sep, the normal temperature of the receiving water shall not be raised more than 1.5°F unless it can be shown that spawning and growth of indigenous organisms will not be significantly affected.	None except where the increase will not exceed the recommended limit on the most sensitive receiving water use and in no case exceed 83°F or in any case raise the normal temperature of the receiving water more than 4°F. During the period including Jul, Aug, and Sep, the normal temperature of the receiving water shall not be raised more than 1.5°F unless it can be shown that spawning and growth of indigenous organisms will not be significantly affected.
Chemical constituents	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair the water for any other usage assigned to this class.	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair the water for any other usage assigned to this class.

On well-drained soils, the major forest vegetation is the Coastal Hardwoods type. Dominant and characteristic tree species include black, red, and white oak (Quercus velutina, Q. rubra, and Q. alba), several species of hickories (especially Carya tomentosa, the mockernut), tulip popular (Liriodendron tulipifera), black cherry (Prunus serotina), sassafras (Sassafras albidum), and hemlock (Tsuga canadensis). On the whole, the forests resemble the Central Hardwoods-Hemlock Zone of the southern hills regions of the state. However, in many places, especially in open forests and woodlands, there is a remarkable development of vines and shrubs. In particular, catbrier and greenbrier (Smilax spp.), poison ivy (Rhus radicans), japanese honeysuckle (Lonicera japonica), and asiatic bittersweet (Celastrus orbiculatus) form dense, impenetrable thickets and tangles. Red cedar (Juniperus virginiana) dominates the early phases of old-field vegetation development. The region is a major avenue for the introduction of plant species into the state. Significant habitats include old-growth forests, salt marshes, mud flats, offshore bird-breeding islands, and coastal sand beaches; most of them have been modified or destroyed by development. The mouth of the Housatonic River is a major area for a number of rare aquatic species such as mud-plantain (Heteranthera reniformis), eaton's quillwort (Isoetes eatonii), and mudwort (Limosella subulata). A number of rare southeastern Piedmont and Coastal Plain plant species reach their northern native range limits in this region, including sweet gum (Liquidambar styraciflua), persimmon (Diospyros virginiana), staggerbrush (Lyonia mariana), Indian plantain (Cacalia suaveolens), sickle-leaved golden aster (Chrysopsis falcata), and crisped bunch-flower (Melanthium hybridum).

Wild animals sporadically occur in the vicinity. Marine invertebrates include one species of sponge, four species of polychaete worms, nine species of snails, six species of clams, eight species of crustaceans, one species of horseshoe crab and one species of echinoderm. The tellin (Tellina agilis), gemshell (Gemma gemma) and the slipper shell (Crepidula fornicata) appear to be dominants.

Apparently no species lists of fishes, amphibians, and reptiles exist for the area. Appendix C provides a tentative list compiled from the Atlas of North American Freshwater Fishes[26], and a Field Guide to Reptiles and Amphibians[27].

There have been 220 species of birds recorded in the vicinity in the 20th century[28], 185 of which appear to be more than accidentals. Some characteristic breeding birds of this region, including several rare species, are: great egret (Casmerodius albus), snowy egret (Egretta thula), yellow-crowned night heron (Nyctanassa violacea), black-crowned night heron (Nycticorax nycticorax), glossy ibis (Plegadis falcinellus), fish crow (Corvus ossifragus), and piping plover (Charadrius melodus).

Three species of mammals are known to occur in the vicinity: the muskrat (Ondatra zibethica), the racoon (Procyon lotor) and the least shrew (Cryptotis parva), a rare Connecticut mammal, which has been reported from salt marshes in this region.

Clearly, with the exception of the birds, the lists are incomplete.

Great meadows and Nells Island (Figure A.1-3) are two wetlands near SAEP that have been set aside as wildlife reserves.

(2) Geology

The late Wisconsinian Ice Sheet covered the vicinity[13].

The bedrock is primarily metamorphic (Paleozoic gneisses and schists). It is complexly folded into north-trending belts.

Epicenters of earthquakes do not normally occur in the vicinity[13].

(3) Soils[29]

Soils are developed on glacial tills in the uplands, on local stratified deposits of sand, gravel, and silt in the valleys, on coastal and tidal deposits of the shores and the extensive estuaries of the Housatonic.

Figure A.2-1 shows the soil of SAEP and adjacent land. The soil of SAEP is classified as urban land, i.e. pavement and buildings cover 50 percent or more of the land surface areas.

The soil adjoining SAEP is classified as coarse borrow and fill materials which consist largely of coarse-textured borrow or cut and fill horizons where nearly all of the original soil horizons have been destroyed or removed.

There is a patch of Westbrook peat adjoining the mudflats north of SAEP. It is subject to flooding at high tide. It is composed of dark-colored fibrous or peaty herbaceous material and has a salt content in excess of 10,000 parts per million. This soil is commonly underlain by loamy mineral material at depths of 64 to 107 centimeters (cm).

Finally, an area of Agawann fine sandy loam occurs to the east of SAEP. This soil has a 0 to 3 percent slope which is well to somewhat excessively drained on terraces developed in deep sands. Textures in the surface and upper subsoil range from fine sandy loam to sandy loam grading into loamy sand at 38 to 64 cm in depth. Permeability is moderate to rapid. Table A.2-4 provides data on the suitability of the soils for urban uses.

f. Cultural Resources

Little evidence remains of archaeological resources in the immediate vicinity of SAEP. Some Indian artifacts have been found at Frash Pond (Figure A.1-3).

g. Land Use[30] and Zoning[31]

Figure A.2-2 shows the uses of land in the immediate vicinity of SAEP. Recreational resources are limited to small parks and public and private open spaces. Agricultural lands are practically nonexistent. Home vegetable gardens are grown in the residential areas. Agriculture was once the primary economic base for the vicinity. However, it has succumbed to urbanization.

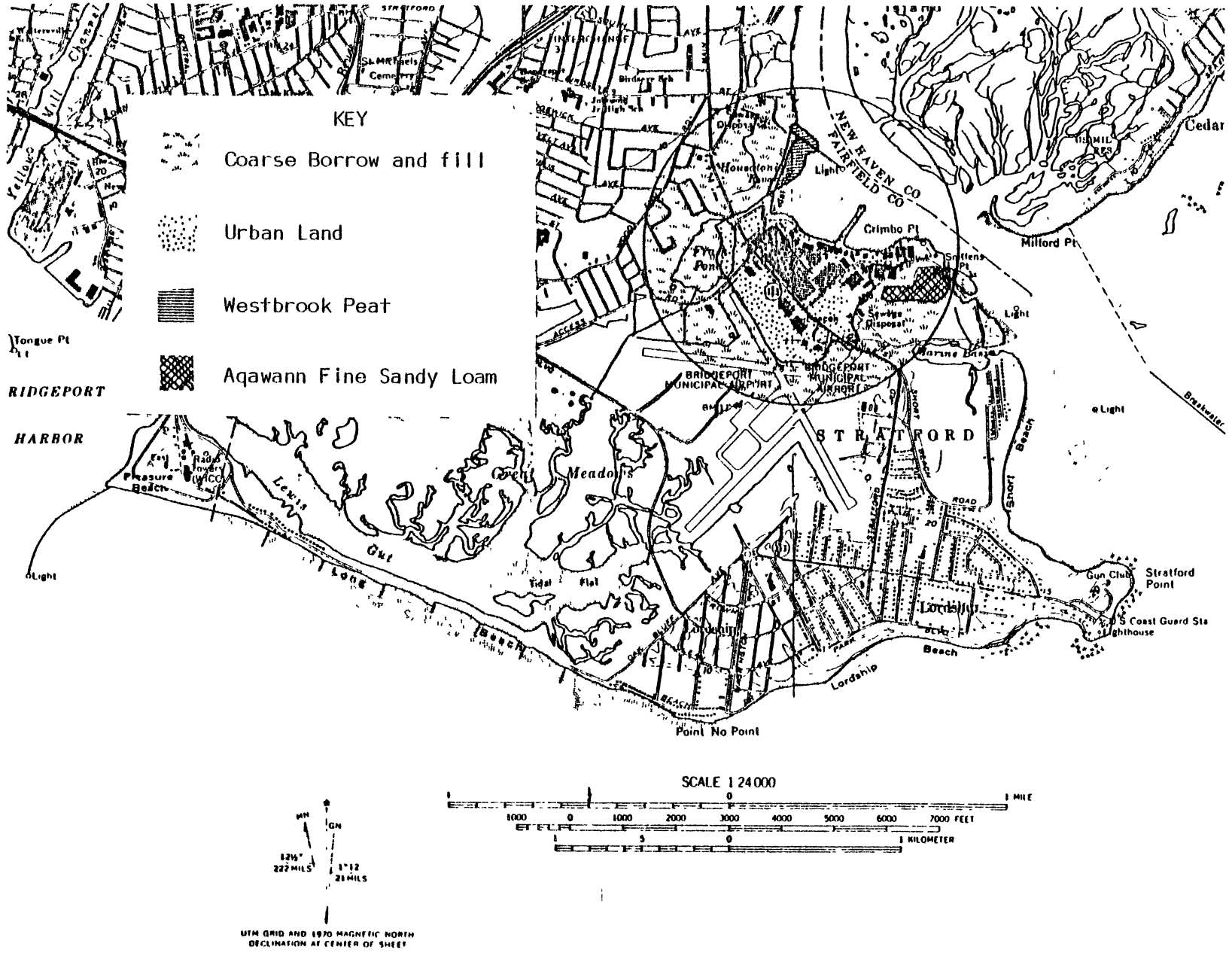


Figure A.2-1. Soil Map of the Immediate Vicinity of Stratford Army Engine Plant.

in the Immediate Vicinity of Stratford Army Engine Plant.

SUITABILITY FOR	FEATURES AFFECTING	SUSCEPTIBILITY TO:	LIMITATIONS FOR:						
								Sanitary Landfill	
Winter Grading	Highway Location	Frost Action	Septic Tank Filter Field	Homesite with Basement	Homesite Landscaping	Streets and Parking Lots	Athletic Fields	Trench Type	Cover Material
Var	Var	Var	Var	Var	Var	Var	Var	Var	Var
Prob good	Prob low	Prob low	Var	Var	Prob poor	Prob good	Prob poor	Var	Var
Very poor tidal inundation	Tidal inundation	High	Very severe [c]	Very severe [c]	Very severe [c]	Very severe [c]	Very severe [c]	Very severe [c]	Very severe [c]
Good	Difficult to establish vegetation on cuts	Low	Slight	Slight	Slight	Slight	Slight	Slight	Slight

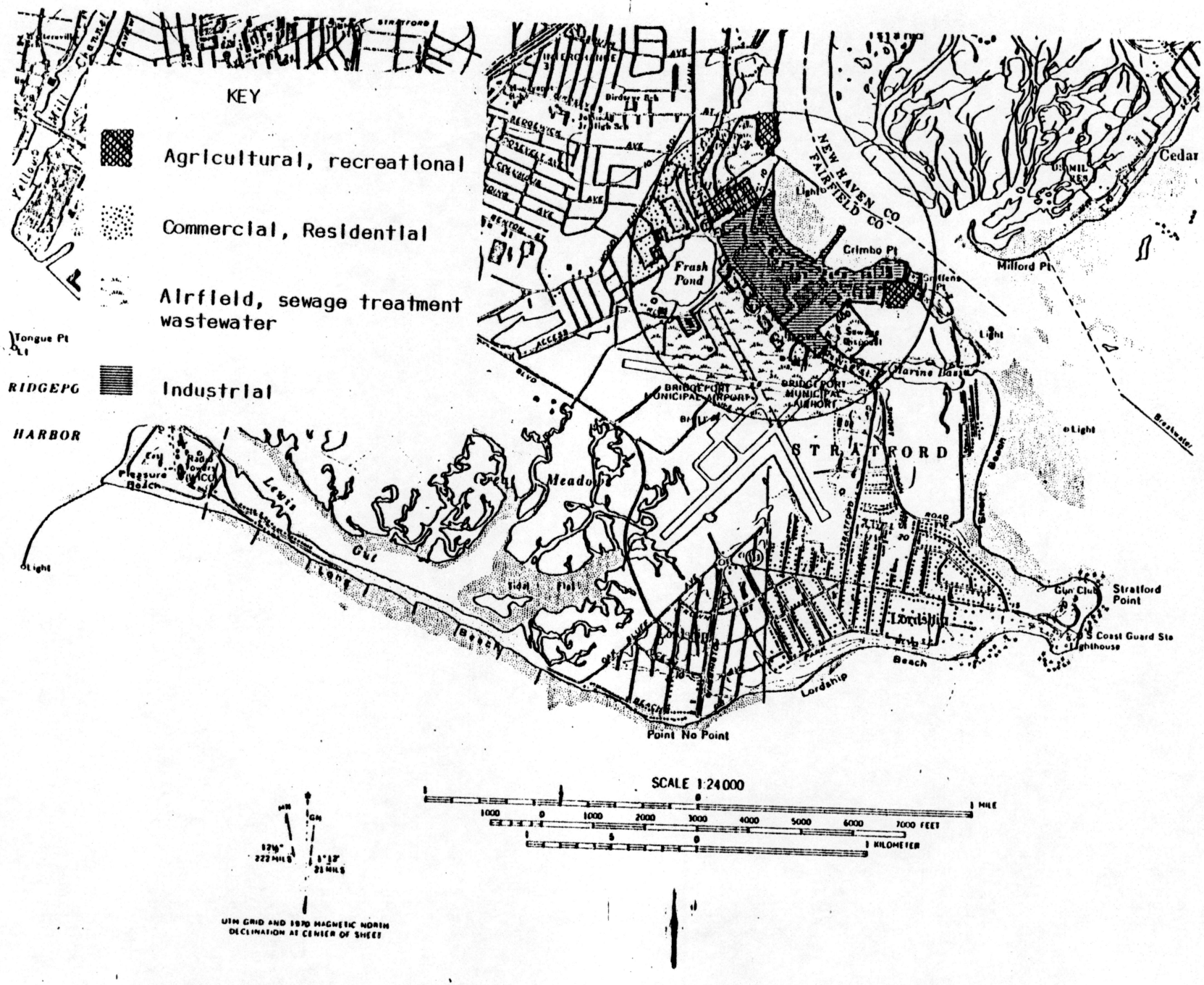


Figure A.2-2. Land Use In The Immediate Vicinity of Stratford Army Engine Plant.

There is a flourishing commercial fishery in Long Island Sound. Menhaden, clams, oysters, flounder, porgies, sea herring and whitings are predominant.

Figure A.2-3 shows the zoning in the immediate vicinity of SAEP. Zoning requirements are spelled out in the Zoning Regulations of the Town of Stratford[32].

Light aircraft over SAEP are restricted to an area above 300 m while Jets are restricted to an area above 450 m. All entrances to SAEP are posted with guards and a badge or escort is required for admittance.

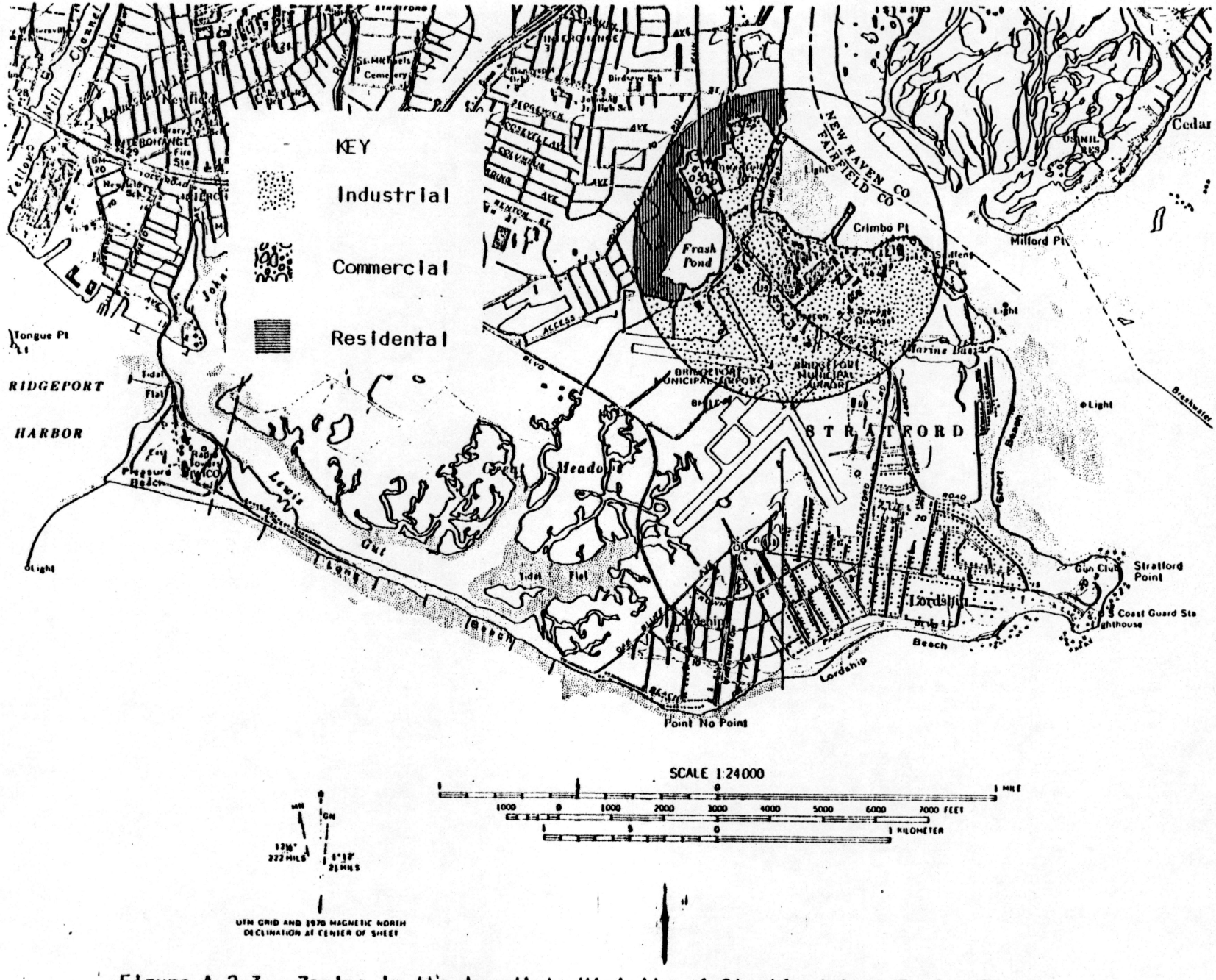


Figure A.2-3. Zoning In the Immediate Vicinity of Stratford Army Engine Plant.

SECTION B. PURPOSE AND NEED FOR STRATFORD ARMY ENGINE PLANT

As described in paragraph A.1.a.(2)(b), the purpose of SAEP is to produce gas turbine engines for selected military aircraft and the M1/Abrams main battle tank. It is now the sole source of the engine for the M1 Abrams tank. The Abrams tank will serve as the primary US mechanized ground combat system from the early 1980s into the next century. Clearly, continued operation of SAEP is vital to our national defense.

SECTION C. ACTIVITIES WITH A POTENTIAL FOR ENVIRONMENTAL IMPACT

1. LIQUID AND SOLID WASTE DISPOSAL

a. Sewage and Sanitation[14, 33]

Most storm water and all wastewater generated at SAEP are handled by three separate sewer systems: a sanitary sewer, storm sewer, and chemical waste sewer. Under normal dry-weather conditions all industrial wastewater is treated before discharge to the Housatonic River. Discharge of industrial wastewater is controlled under the National Pollutant Discharge Elimination System (NPDES) administered by the State of Connecticut, Department of Environmental Protection (DEP)[34]. The NPDES Permit/Order (Appendix D) also contains a compliance timetable spanning a period of 16 months (i.e. 31 May 80 through 31 Aug 81) with an expiration date of 20 May 85. Monitoring of the plant wastewater discharges is presently accomplished monthly for AVCO Lycoming under contract[35, 36]. The SAEP has a total of eight outfalls (i.e. discharge points) [001-008 (Figure C.1-1)] under the NPDES Permit.

(1) Sanitary Sewer

All domestic wastewater is conveyed via the sanitary sewer system to the Town of Stratford's domestic wastewater collection and treatment system. The town has a secondary treatment facility that treats domestic and industrial wastewaters using the activated sludge process. The facility is designed to handle a flow of 44 million liters per day.

(2) Storm Sewer

The storm sewer system collects most of the storm water runoff and all miscellaneous industrial wastewaters (i.e., boiler blowdown, cooling water, soluble and insoluble cutting oils, and spent hydraulic fluid), excluding metal plating wastewater. As shown in Figure C.1-1, the system is divided into six sections (total of 31 hectares) which collect the storm and waste water from SAEP. Because of the relatively low elevation and the need for flood prevention dikes [refer to paragraph C.4.a.(4)(d)], each section has a wet well and pump station. Normally, all storm waters and wastewaters from each section flow into the section wet well and are pumped to the industrial wastewater treatment plant (IWTP) (Figure C.1-2). The average flow is approximately 9,462,500 ℓ of wastewater per day. During heavy storms, when the total flow exceeds 22,710,000 ℓ/day, by-pass pumps in each wet well are automatically activated and the excess flow is pumped directly to the Housatonic River via outflows 001-006. The IWTP and the pumping system are covered by a turbine-generator back-up power system.

The IWTP was designed to handle flows up to 22,710,000 ℓ/day. Treatment consists of chemical coagulation and flocculation using liquid alum followed by dissolved-air flotation. Major treatment units include a 750,000-ℓ storage surge tank, a flash mixer, two flocculators, and two flotation units. The treatment plant effluent is discharged to the Housatonic River via outfall 007. Skimmings from the flotation tanks are piped to an oil separator and oil storage tanks and periodically removed by a local contractor. Approximately 227,100 ℓ of skimmings are generated annually.

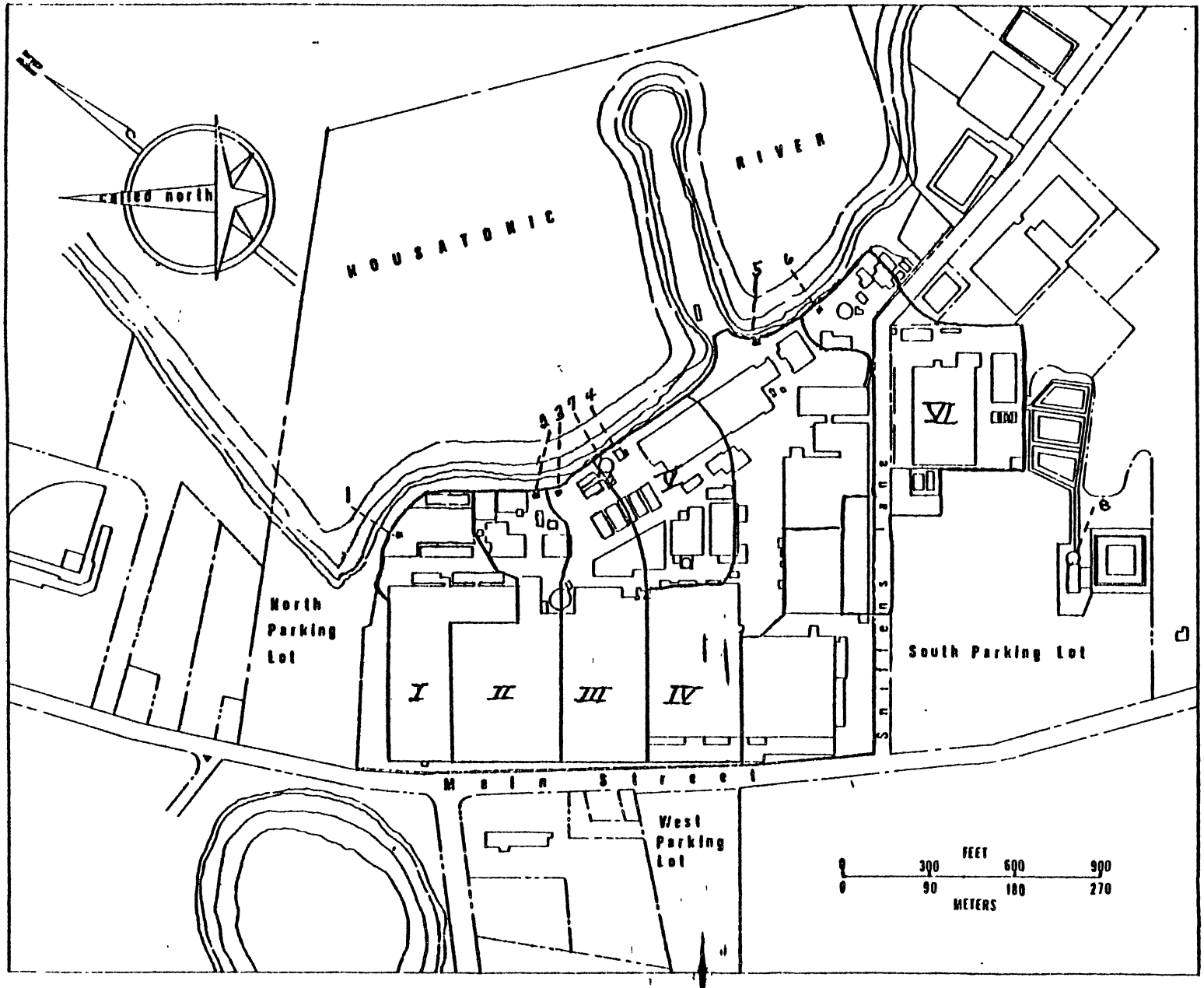


Figure C.1-1. Storm Sewer Collection System and Location of Outfalls (00)1-(00)8.

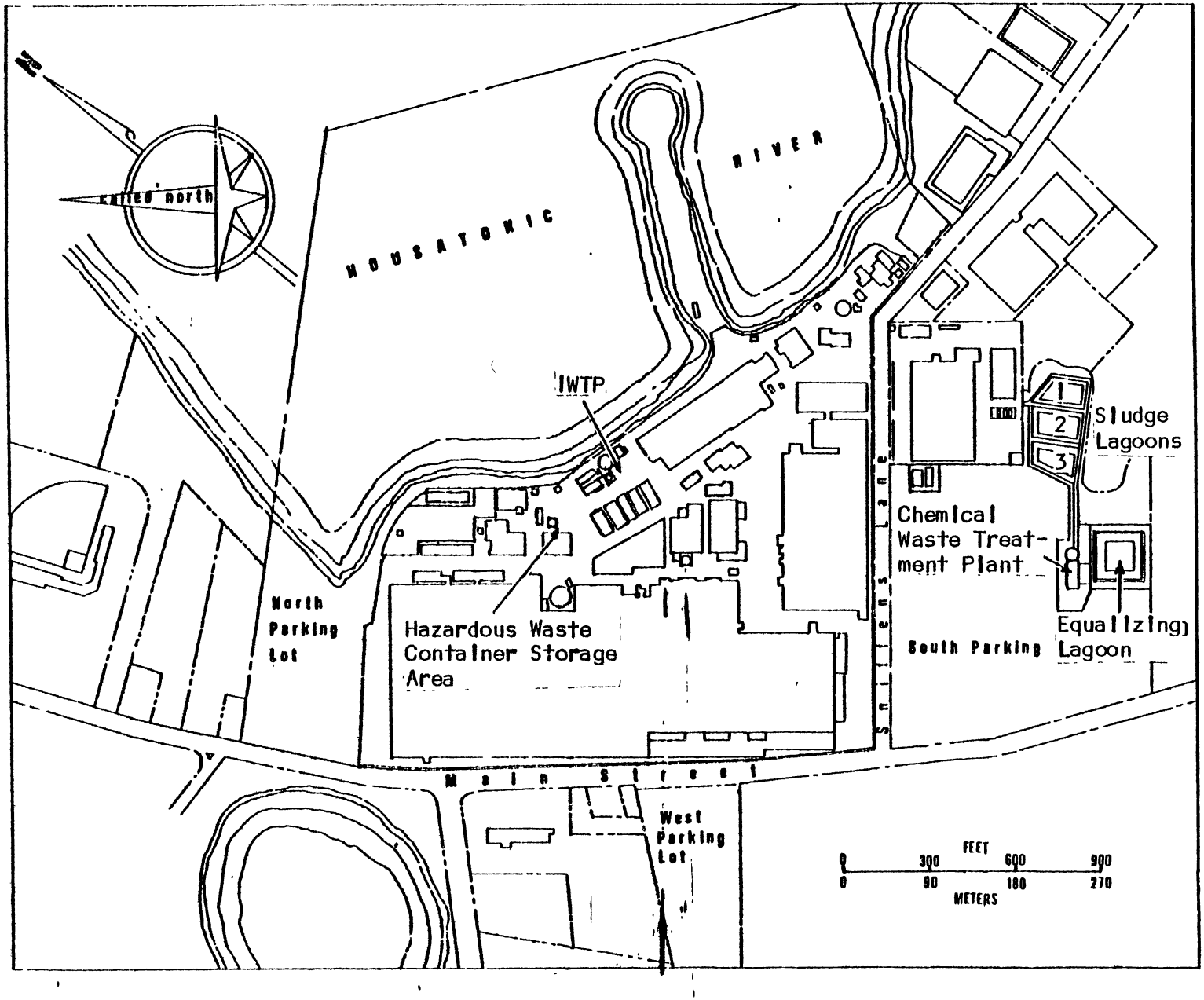


Figure C.1-2. Waste Treatment/Storage Facilities

(3) Chemical Waste Sewer

All metal plating wastewater is discharged into the chemical waste sewer and collected in a large equalization pond at the Chemical Waste Treatment Plant (Figure C.1-2). From the equalization pond the wastewater is pumped at a controlled rate to cyanide treatment, chromium treatment, neutralization with lime, ferrous sulfate addition, and clarification. The rate of pumping is established by pH tests and spot plate tests for chlorine and chromium reduction conducted every two hours. The treated effluent is discharged directly into a tidal basin [outfall 008 (Figure C.1-1)] isolated from outfalls 001-007. The system meets the present NPDES permit limits. Approximately 270 m^3 of sludge are generated annually in the treatment process. The sludge is pumped to the sludge lagoons, Figure C.1-2, and periodically removed for disposal by a private contractor. The implications of the sludge lagoons under the Resource Conservation and Recovery Act (RCRA) are discussed in Section C.1.b.

(4) Monitoring Program for Outfalls 001-008

Discharges from outfalls 001-006 (storm water overflows - wet weather) are monitored monthly for observable discharge. There is no discharge from these outfalls during dry weather conditions as explained above. If discharge should occur during heavy storm conditions, flow is monitored for the parameters (i.e. flow, oil and grease, phenols, suspended solids, and pH) and limits set forth in the NPDES Permit.

Discharge from outfall 007 (oil and grease plant effluent) is monitored monthly for flow, oil and grease, phenols, suspended solids and pH as per the NPDES Permit.

Discharge from outfall 008 (effluent from the metal plating wastewater treatment plant) is monitored monthly for copper, cyanide (total), cyanide (amenable), chromium (hexavalent), chromium (total), nickel, zinc, cadmium, iron and total suspended solids as per the NPDES Permit.

(5) Probable Impact

The SAEP is in compliance with the sampling and reporting requirements of the NPDES Permit and AVCO Lycoming is working closely with the Connecticut DEP and the US Army Corps of Engineers to be sure they remain in compliance. The requirements in the Permit are established by the Connecticut DEP to insure that the water quality in the Housatonic River will meet the water quality criteria specified in the present and proposed water quality categories discussed in paragraph A.2.c.(1). The wastewaters probably have a localized impact at the outfalls, however, the Housatonic River at SAEP undoubtedly provides dilution of the wastewaters to safe concentrations. The effect of a salt wedge on this dilution has not been determined, therefore it is possible that some of the outfall could move upstream with the salt wedge during flood tide.

A large amount of cyanides has been detected in the sludge[37]. Theoretically, the cyanides are converted to CO_2 and N_2. However, the large amounts of cyanides discovered in the sludges would indicate that this may not be the case. The mixing of all waste streams in the equalizing lagoon prior

to any treatment may allow heavy metals to complex with the cyanides thus interfering with the cyanide oxidation. In addition, the absence of mechanical mixing during the cyanide treatment may also result in incomplete treatment. Any future state-of-the-art studies for the treatment system should consider separate treatment of the waste streams and mechanical agitation during cyanide oxidation. Based on the test data of this report, by segregating metal-bearing wastes and cyanide-bearing wastes the amount of sludge considered to be hazardous waste would be reduced.

b. Solid Waste[38]

(1) Characteristics

All of the solid waste generated by SAEP industrial processes, food service facilities, medical dispensary and administrative areas are collected for disposal or reclamation by private contractors. The amount of solid waste generated each year is approximately 5800 metric tons.

(2) Collection, Storage, and Transportation

The solid wastes generated by the administrative areas, medical facility and food service facility are collected and stored in dumpster containers ranging in size from 4.7 to 30 m^3. Industrial solid wastes, excluding reclaimed materials (refer to Appendix E), are transported from the shop areas to three large compactor dumpsters located near the oil reclamation plant. The dumpster area is maintained by a fulltime attendant who insures the area is kept clean. Service for the above solid-waste containers, which includes routine cleaning and maintenance, is provided by a private contractor.

Scrap wood is transported daily to the Stratford Sanitary Landfill by plant personnel. Tilt frame vehicles are used to bring stationary compactors and open top containers to the landfill. Dumpster containers are collected by a front-end loader.

(3) Disposal

Most solid waste is disposed of at the municipally-owned Stratford Sanitary Landfill located approximately 8 km from the installation. The landfill has a Connecticut Environmental Protection Agency permit.

(4) Resource Recovery

Various scrap metals that are marketable are sold each year to purchasing contractors on a competitive bid basis. The Purchasing Department of AVCO Lycoming negotiates each transaction. Magnesium, steel, and aluminum are recycled.

Paper generated by the facility is normally disposed of as regular waste in the sanitary landfill. The one exception is discussed in paragraph C.2.a.(1).

(5) Hazardous Waste (RCRA)[39]

(a) Medical facilities. Stratford Army Engine Plant has a small clinic primarily used for job-related physicals and occupational injuries. Contaminated specimens are sent to the state laboratory for analysis thus eliminating laboratory wastes which include bacteriological cultures and other pathological wastes. Needles and syringes are broken, sealed in tied plastic bags, autoclaved, and discharged as non-infectious wastes. X-ray development is accomplished through a self-contained developer eliminating the production of chemical waste.

(b) Industrial Wastes. The SAEP stores, treats and disposes of hazardous industrial wastes. As such, SAEP has recently submitted to the US EPA (Nov 80) a hazardous waste permit application[40] as required by law under the regulatory requirements of RCRA. The permit application (Appendix E) lists and describes hazardous and non-hazardous wastes, existing environmental permits, process design capacity, drawings, and photographs of all existing waste storage, treatment, and disposal sites, present and future. The AVCO Plant Engineering Department has established a program for visual inspection of polychlorinated biphenyls (PCB) items. The initial inspection was completed by 10 August 1981 as required by the Code of Federal Regulations 59 (CFR). The records are maintained on file and contain the information required by the CFR.

(6) Probable Impacts

The SAEP is in compliance with the permit application requirements of the hazardous waste management provisions of RCRA, as well as the other aspects of RCRA. AVCO Lycoming is working closely with The Connecticut DEP and the US EPA to be sure they remain in compliance. Resource recovery requires less overall energy and has less potential for adverse environmental impact than processing the raw material.

2. AIR EMISSIONS

a. Stationary Sources

There are 344 potential stack emission sources at SAEP. At any given time a large portion will be inactive. Sixty-three are required to be registered with the Connecticut DEP. Of these, 50 have been registered and the remainder are pending (Table C.2-1)[42,43]. Registration of an on-site waste liquid incinerator has been denied by DEP. The incinerator is not in service.

In addition, there are 39 storage containers (Table C.2-2)[17] that have an intermittent potential for air emissions. All above-ground tanks are diked to contain a total spill.

The above sources are located in Figure C.2-1 and are discussed further below:

(1) Stationary Fuel Consumption Sources

Table C.2-1. Air Emission Sources at Stratford Army Engine Plant Which Require Registration.

Description	Bldg No.	Pollution Control/ Monitoring Equipment	DEP[a] Registration or Permit No.	PROCESS			INPUT MATERIALS		
				Time (Hrs/Wk)	Temp (°F)	Polymerize/ Flame[b]	Name	Daily Consumption Peak	Daily Consumption Ave[c]
Boilers (3)	2	Dynatron 1001 Smoke monitor	178-001 178-87 178-116	Varies	80 MBtu[d]	No	No. 6 fuel oil (1/2 percent sulfur) and Natural Gas	23,800 ℓ ea	14,700 ℓ ea
Boilers (2)	17	Dynatron 1001 smoke monitor	178-90 178-91	50		No	No. 4 fuel oil (0.05 percent sulfer	1,120 ℓ ea	750 ℓ ea
Gas Turbine Engine Test Cells (22)	16	None	178-182 thru 178-203	16			JP4, JP5, Diesel		
Gas Turbine Engine Environmental Test Cells (7)	6	None	178-204 thru 178-210		178-182 and 178-202 inactive				
Fan Test Cell	56	None	178-211						
High Temperature Test Cell	62	None	178-212						
Incinerator	2	None	178-101		inactive				
Incinerator Cleaning Line	2	None	178-102		inactive				
Incinerator Cleaning Line	2	None	178-103	40	inactive 180	No	paper	18 kg	2.2 kg

Table C.2-1. Air Emission Sources at Stratford Army Engine Plant Which Require Registration (cont'd).

Description	Bldg No.	Pollution Control/ Monitoring Equipment	DEP[a] Registration or Permit No.	PROCESS			INPUT MATERIALS		
				Time (Hrs/Wk)	Temp (°F)	Polymerize/ Flame[b]	Name	Daily Consumption Peak	Daily Consumption Ave[c]
Endogas Generators (7)	2	None	Pending						
Excess Gas Flares (6)	2	None	Pending						
Flare (furnace) (5)	2	None	Pending						
Plating Shop Stacks (5)	2	Wet scrubber	178-92 thru 178-96			No	sulphate, cyanides, nitrates, Ni, Cu, Zn, Fe, Cr		6.2 kg Total
Anodizing Shop Stack	2	Wet scrubber	178-97		RT	No	sulfates, cyanides, nitrates, Ni, Cu, Zn, Fe, Cr		30 kg
HAE Anodize HAE Treatment Tank No. 29 (post dip)	2	None	178-180	40	RT	No	ammonium Bi-fluoride (7.4 g/ℓ)	6.7 kg	0.46 kg
HAE Anodize HAE Strip-tank No. 31	2	None	178-180	40	180	No	Cr acid (59 g/ℓ)	6.7 kg	112 g

Table C.2-1. Air Emission Sources at Stratford Army Engine Plant Which Require Registration (cont'd).

Description	Bldg No.	Pollution Control/ Monitoring Equipment	DEP[a] Registration or Permit No.	PROCESS			INPUT MATERIALS		
				Time (Hrs/Wk)	Temp (°F)	Polymerize/ Flame[b]	Name	Daily Consumption Peak	Daily Consumption Ave[c]
HAE Treatment Tanks No. 33 and No. 34	2	None	178-180 178-181	40	55	No	KF - 11 g/ℓ	460 g	340 g
							$KMnO_4$ - 6 g/ℓ	1.35 kg	1.12 kg
							KOH - 37 g/ℓ	3.6 kg	2.7 kg
							Na_3PO_4 - 11 g/ℓ	460 g	340 g
							$Al(OH)_3$ - 11 g/ℓ	1.35 kg	1.2 kg
Research Shop Stack	3	None	178-100	168	RT	No	sulfates, cyanides, nitrates, Ni, Cn, Zn, Fe, Cr		.27 kg

[a]Connecticut Department of Environmental Protection
[b]Does the material polymerize and/or does the material or its vapors come in contact with open flame?
[c]Average
[d]MBtu - Million British thermal units

Table C.2-2. Storage Facilities for Oil and Oil Products at Stratford Army Engine Plant.

Fuel	Location	Number of Tanks	Capacity of Each (ℓ)
	Tank farm	4	66,237
		1	15,140
	Building No. 6	2	18,925
		1	73,807
	Offsite leased storage	1	397,426
JP-4	Tank farm	2	66,237
Diesel No. 2	Tank farm	4	18,925
	Building No. 6 (Mobile)	3	26,495
	Building No. 6	1	73,807
	Offsite rented storage[a]	1	397,426
Diesel No. 1	Main boiler storage	1	37,850
Fuel No. 6	Main boiler storage	1	302,800
		1	1,514,004
Fuel No. 4	Tank farm	2	75,700
	Building No. 17	1	75,700
Fuel No. 2	Building No. 18	1	3,785
Gasoline Unleaded	Main storage	1	9,462
Gasoline Leaded		1	9,462
Lube Oil	Building No. 16	4	19,000
Waste Oil	Building No. 13	1	35,000
		1	30,000
		2	15,000
Salvaged Oil	Building No. 13	2	9,400

[a]Rented, as required, located in Stratford.

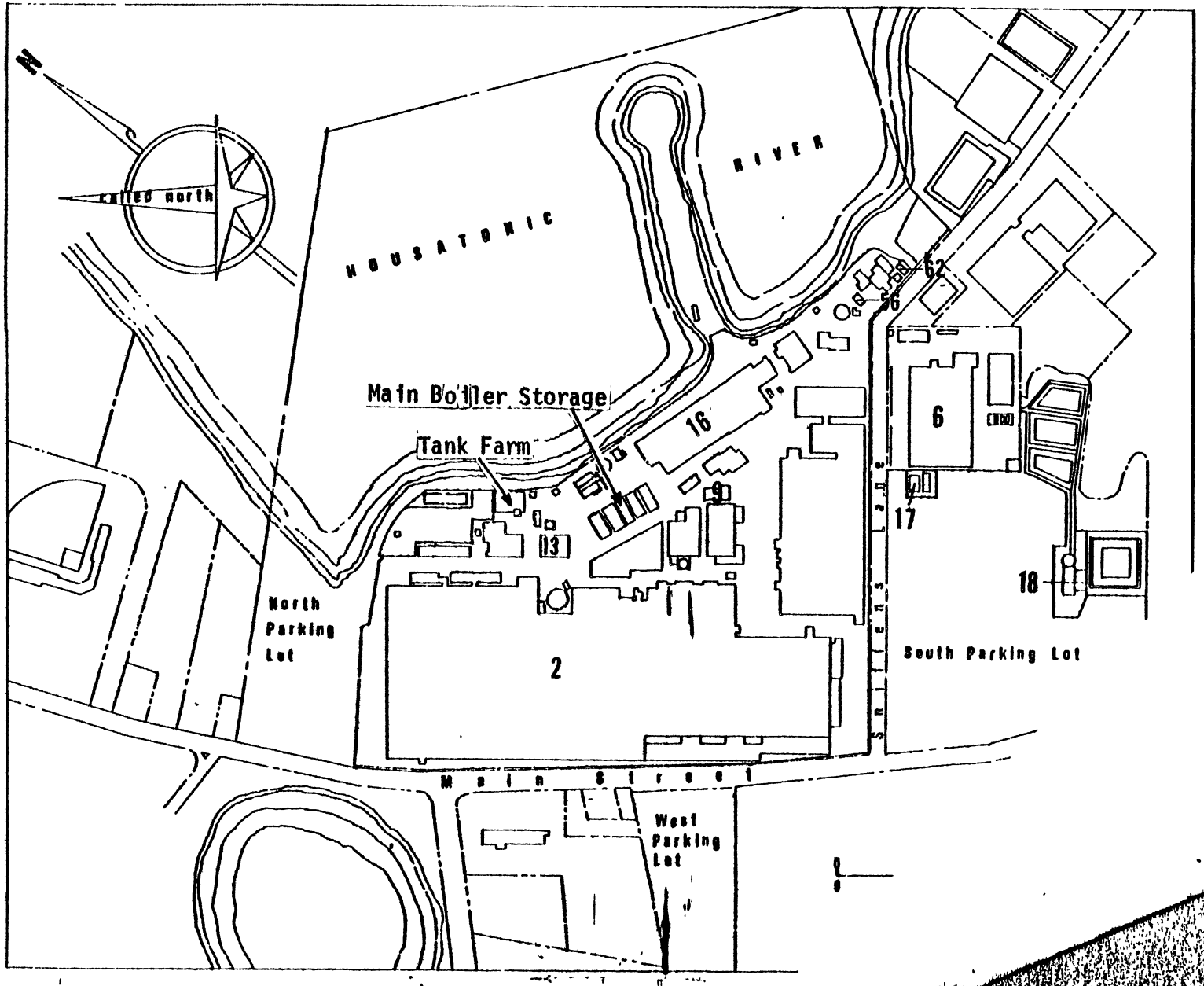


Figure C.2-1. Location of Air-Emission Sources at Stratford

Table C.2-1 provides information on the boilers required to be registered. In addition there are seven units that are inactive[43]: three emergency fire pump diesel engines, two natural gas furnaces one air furnace, and one heating boiler which would burn No. 2 fuel oil.

Each gas turbine engine is operated in a test cell for validation prior to shipment. All 31 cells are registered with DEP (Table C.2-1). There are eight fuel pump test stations and one fuel test stand which vent non-combusted vapors of JP-4 and JP-5 (Jet) fuel. There are 12 active engine testways which release combusted JP-4 engine fuel[42].

A small, single chamber, incinerator with a 6-meter emission stack is used intermittently to burn waste paper[43]. Two other incinerators are registered but inactive.

Seven inert gas generator flares and six excess gas flares for furnaces in the heat treating department are registered. These generator and furnace flares are components of the selected gas generators and heat treatment furnaces located inside one large bay area in the main plant building at SAEP, and are thus not controls on direct emission stream ducts, vents or stacks. These slow burning flares are manufacturer design components of the equipment to which they apply and are not retrofitted control devices[43].

(2) Process Operations

Process operations constitute the majority of the 344 potential stack emission sources at SAEP. They can be divided roughly into the following operations: (1) grinding and sandblasting, (2) anodizing, (3) plating, (4) degreasing, (5) painting and (6) heat treatment. Eleven process operations are required to be registered with DEP (Table C.2-1). The remainder of the process operations are too small or too intermittent to require registration. Table C.2-1 provides a summary of the chemicals consumed in process operations. The bulk of these chemicals end up either on a manufactured item, recycled [paragraph C.1.a.(4)] or go to either the oil pollution abatement facility or the chemical waste treatment plant [paragraphs C.1.a.(2) and C.1.a.(3),respectively]. The remainder is vented to the atmosphere. Treatment consists of wet scrubbers (Table C.2-1) used for anodizing and plating, and fabric filters used for grinding and sandblasting.

(3) Probable Impact

(a) Stationary Fuel Consumption Sources

In 1977[16] and again in 1981[17] US AEHA performed air pollution abatement surveys at SAEP. The survey in 1977 showed that all boilers evaluated were in compliance with applicable emission standards. The three main power house boilers were being fired with natural gas at the time of the survey and no evaluation of visible emissions (percent plume opacity) was possible during the boilers' firing with residual fuel (No. 6 - which occurs during a substantial part of the year). Fuel analysis records, however, showed the residual oil utilized to be of a low ash and sulfur content, thereby minimizing air pollutant emission potential. Intermittent fuel combustion at SAEP's engine test cell facilities was also examined, and visible emissions

during test cell operations observed. These test cells, vented to the atmosphere, produced trace visible emissions (less than 5 percent opacity). The 1981 survey reconfirmed the above findings and additionally estimated the hydrocarbons from each of the two diesel cells to be no more than 70 kg per year.

(b) Process operations

The 1977 US AEHA survey found that all processes were in compliance with applicable air pollution control requirements. However, the fabric filter unit controlling particulate emissions from the sandblasting operation was found to be deficient, causing a localized air pollution problem. Fugitive emissions from the uncontrolled removal and storage of collected particulate matter in an open top container were causing potential health nuisance problems to plant workers in the work vicinity and were also resulting in deposition of particulate matter in the adjacent main boiler plant, with potential adverse abrasive damage to boiler ball bearings and other plant equipment. Controlled removal and closed-top storage container measures to confine collected particulate matter were recommended. The 1981 survey verified the recommendation was implemented.

b. Mobile sources

(1) Description

No specific State regulatory requirements apply to mobile air pollution sources at SAEP. A small fleet of vehicles such as fork lifts, flat bed trucks, and related vehicles are utilized in routine operations. These vehicles are principally gasoline or propane fueled.

The average worker lives 14 km from SAEP with nearly 64 percent of the workers living closer than this distance[44]. Surveys have shown that approximately 165 ride three buses provided by the Greater Bridgeport Transit District and another 500 car pool[45]. Thus, approximately 15 percent of the employees are involved in ride-sharing.

AVCO Lycoming is a leader in the area for this program[46] and provides preferential parking for those that car pool. AVCO Lycoming has also developed a computerized car pool matching program to encourage car pooling by matching those people from the same area, working on the same shift, and arriving at the plant at the same time.

(2) Probable Impact

Mobile sources at SAEP do not pose a problem. The car pooling - mass transit program is certain to cut down on emissions, conserve fuel, and have a positive influence on the employees.

c. General Impact

Fuel consumption is discussed in paragraphs C.3.b and C.3.c.

A comprehensive review of all organic products storage, principally oil and oil products, was conducted by the US AEHA in 1977[16] and again in 1981[17]. In the earlier survey all facilities were found to comply with the major requirements identified in the Connecticut air pollution control regulations. However, requirements in Section 19-508-20, "Control of Organic Compound Emission" were not being followed. This section requires that pumps and compressors handling volatile organic compounds be equipped with mechanical seals or best available control technology. The 1981 survey verified that the defect has been rectified. Permanent, submerged fill pipes had to be installed upon Connecticut Air Pollution Control Commission (APCC) notice, for all storage vessels of more than 250 gallons capacity used to store volatile organic compounds.

AVCO Lycoming has developed an air-pollution emergency episode response plan[47] in compliance with Connecticut law[48]. The plan reduces the plant emissions through 4 successive stages to the point in stage 4 (extreme emergency), where there is as much as a 100% reduction in certain emissions.

Principal direction of the plant's existing air pollution abatement program stems from interaction with and directives from the Connecticut DEP APCC. The Connecticut APCC has treated the Stratford plant essentially as a private industrial complex, and SAEP under AVCO Lycoming reponds to both administrative and procedural requirements and substantive standards of the state. In addition, the Army must comply with requirements in AR 200-1[18].

3. PUBLIC UTILITIES

a. Water Supply[49]

(1) Description

All water used at SAEP is treated, analyzed, and supplied directly by the Bridgeport Hydraulic Company, a private water source. Both surface and well water is stored in the Trap Falls Reservoir prior to treatment and distribution. Treatment consists of pH adjustment using lime, zinc phosphate addition for corrosion control, chlorination, and fluoridation. Treated water is periodically analyzed for physical, chemical, heavy metal, pesticide, and bacteriological parameters. Analytical procedures are certified by the State of Connecticut, and state inspections are conducted yearly. No sampling or analyses are conducted within the confines of SAEP. One 1,500,000-liter storage tank with emergency pumps is used for fire-demand. The only water requiring treatment at the plant is for boiler feedwater, which is treated by ion exchange softening.

The SAEP uses an average of about 75 million ℓ of water per month, heaviest usage occurs between June and September. The majority of the water is used in manufacturing processes as the solvent for cutting oil solutions, as make-up rinse water for metal plating operations, and as cooling and condensing water. Refer to Table C.3-1 for percentage breakdown. There is no recreational-type water use at the plant.

Table C.3-1. General Breakdown of Water Use, Percent Basis, Stratford Army Engine Plant.

Process water (i.e., make-up rinse-water in metal plating operations, solvent used for soluble cutting oil solutions, etc.	53 percent
Air-conditioning, cooling and condensing water	41 percent
Sanitary service	3 percent
Boiler feedwater	3 percent

Table C.3-2. Approximate Quarterly Consumption of Fossil Fuels and Electricity Used for Heating, Cooling, and Power at Stratford Army Engine Plant.

Quarter	Propane (ℓ)	Natural Gas (m^3)	Fuel Oil No. 2 (ℓ)	Fuel Oil No. 4 (ℓ)	Fuel Oil No. 6 (ℓ)	Electricity
Jan - Mar	25,500	75,000,000	5,040	50,000	2,200 000	13,200,000
Apr - Jun	35,000	64,000,000	6,000	49,000	-	13,200,000
Jul - Sep	12,500	25,000	-	-	-	13,500,000
Oct - Dec	19,000	78,000,000	5,040	-	790,000	13,500,00

Table C.3-3. Approximate Quarterly Consumption of Fossil Fuels Used for Transportation at Stratford Army Engine Plant.

Quarter	JP4	JP5	Diesel	MOGAS	
				Leaded	Unleaded
Jan - Mar	480,000	960,000	230,000	22,000	7,500
Apr - Jun	450,000	700,000	160,000	15,000	5,400
Jul - Sep	340,000	1,090,000	420,000	15,000	5,600
Oct - Dec	500,000	1,000,00	450,000	12,500	10,000

(2) Probable Impact

The water utilized meets applicable Federal criteria for chemical substances except for phenol. The phenol level has averaged 0.002 mg/ℓ, whereas the applicable Federal Standard is 0.001 mg/ℓ[51]. The phenol standard is, however, based on the taste and odor threshold level. Phenol is not a constituent of health significance at this low level.

In accordance with paragraph 9.b.(2), TB MED 229[50], the size of the workforce at SAEP dictates that a minimum of 11 water samples must be taken per month for bacteriological determination. These samples should be taken from dining facilities, administrative areas, and the medical dispensary at a minimum. The installation medical authority (the regional Medical Department Activity, Health and Environment Activity at Fort Devens, MA) is responsible for the bacteriological monitoring. Although sampling is not currently being performed, the responsible authority is being notified and asked to determine applicability.

The quantity of water consummed at SAEP is large, but it constitutes only a small fraction of that distributed by Bridgeport Hydraulic Company.

b. Heating, Cooling, and Power[52]

(1) Description

Table C.3-2[52,53], identifies the fossil fuel and electricity used for heating, cooling and power. Propane is used primarily in propane-fueled vehicles and natural gas is used primarily for industrial heat treatment and steam heating. Electricity is used primarily for lighting, electrical motors, and computers. The fuel oil is used primarily for heating. With the exception of electricity, all utilities show seasonal fluctuations with the summer months being the lowest.

(2) Probable Impact

The consumption of fossil fuels and electricity represents the loss of an irretrevable resource. However, the amount is to be expected for an operation of the magnitude of AVCO Lycoming. Every effort is made to avoid waste in order to increase the profit margin. In fact as a crude measure, overall fossil fuel usage declined by 8 percent from 1979 to 1980 and electricity usage declined by 6 percent[17]. Air emission sources are identified in paragraph C.2.a.(1).

c. Transportation Fuels

(1) Description

As stated in paragraph C.2.b.(1), there are only a few vehicles at SAEP. However, the engines produced are tested prior to shipment [paragraph C.2.a.(1)] and the testing consumes fuels. Table C.3-3[53] identifies the transportation fuels consumed at SAEP. The vast majority in this table is a result of the testing.

(2) Probable Impact

The consumption of fossil fuels for transportation represents the loss of an irretrievable resource. Every effort is made to avoid waste in order to increase the profit margin. Air emission sources are identified in paragraph C.2.a.(1).

4. INDUSTRIAL HEALTH AND SAFETY

a. Description

(1) Pesticide Program

Two private applicators certified by the State of Connecticut provide pest control services on a contractual basis to SAEP. The application level is so low that DARCOM does not require an official report from SAEP detailing the types and quantities of pesticide used[54]. The regional medical authority (the Medical Department Activity, Health and Environment Activity at Fort Devens, MA) conducts an entomological survey once per year.

(2) Hearing Conservation

In 1978 a hearing conservation survey was conducted by AEHA[55]. Five major noise-hazardous areas were identified. The results are summarized in Table C.4-1[55]. Many inadequacies were encountered during the survey. These inadequacies have since been rectified[56].

(3) Industrial Safety

Industrial safety is managed by Safety Personnel within AVCO Lycoming's Industrial Security Section. Additional support is provided by the company's insurance carriers (Arkwright Boston Insurance and ESIS, Inc.). Both provide loss control or prevention reports to identify and recommend corrections for deficiences[57] [58].

The 1980 lost workday case rate is slightly above that for the aircraft engine industry (4.0 compared to 3.0). But the lost workday rate (the number of injuries resulting in absence from work per 200,000 man hours of exposure) is below the industrial average (38.9 versus 42.0). The former shows more attention is given to each case while the latter shows that the safety program is excellent, especially considering the fact that many new employees are being hired and old employees are being required to assume new tasks associated with the increasing production of the M1 gas turbine engine [paragraph A.1.a.(2)(b)].

(4) Emergency Programs

All provisions for emergency situations with the exception of those for pollution spills are spelled out in the Emergency Response Plan[59].

Table C.4-1. Noise-Hazardous Areas at Stratford Army Engine Plant.

Location of Operations	Noise Level	Number of Personnel Exposed
1. Bldg 16, Production Test Cells		12
a. Test Cell - 4B		
(1) Inside Test Cell	105-107 dB(A)[a]	
(2) Outside Test Cell at Door	91 dB(A)	
b. Test Cell - 7A		
(1) Inside Test Cell	114-118 dB(A)	
c. Test Cell - 8A		
(1) Inside Test Cell	114-116 dB(A)	
d. Test Cell - 10A		
(1) Inside Test Cell	116-117 dB(A)	
e. Test Cell - 10B		
(1) Inside Test Cell	114-116 dB(A)	
(2) Outside Test Cell at Door	100-101 dB(A)	
2. Bldg 19, R D Lab		13
a. 19, Test Cell Area	94-96 dB(A)	
3. Bldg 5, Fuel Control Calibration		6
a. Test Stand - 59	Not measured[b]	ND[c]

Table C.4-1. Noise-Hazardous Areas at Stratford Army Engine Plant (cont'd).

Location of Operations	Noise Level	Number of Personnel Exposed
b. Test Stand - 57	Not measured[b]	ND[c]
4. Bldg 2, Power Plant		7
a. Turbine Test, Power Plant	96-114 dB(A)	
b. Aisleway During Turbine Test, Department 24D	94-96 dB(A)	
5. Ruemelin Sandblaster	92-94 dB(A)	3

[a]Decibels on the "A" scale, the scale on a sound-level meter which closely mimics the sensitivity of the human ear (attenuating or excluding both high and low frequencies).

[b]Not Measured - Evaluations of similar operations have indicated that the noise levels exceed the exposure criteria set forth in Table G-16, 29 CFR 1910.95.

[c]Not Determined.

(a) Power Failure

A 25 kilowatt (kW) generator supplies power to Guard Headquarters, DCASMA, the telephone operator's room, and the main isle of of Building 2. A T55 gas turbine engine drives a generator to power the boiler room, all storm pump houses, and the waste abatement treatment operation. Two portable gasoline generators (10 kW and 75 kW) would be used to supply lighting as necessary. Fire truck No. 1 includes a built-in 25 kW generator that could supply additonal lighting. There are 105 two-hour storage, battery lighting units located throughout SAEP in stairwells and at exit points. Flashlights are also available as are the lights on battery-operated forklifts and tow motors.

(b) Fire

The Guard Headquarters can be alerted to a fire by telephone or through one of 77 alarm boxes at SAEP. Fire fighting equipment at SAEP includes: One 1900-liter pumper, an interplant fire booty, an interplant fire pumper with an 800-liter capacity, a 1300-liter dry chemical container mounted on a pickup and 1,400 extinguishers located throughout SAEP. In addition all major buildings are protected by automatic sprinklers.

Should a fire require outside assistance, the Stratford Fire Department can be alerted.

(c) Adverse weather conditions

Adverse weather conditions include hurricanes, thunderstorms, extreme rainfall or more than 5 centimeters of initial snow fall with additonal accumulation expected. Guard headquarters will obtain updated forecasts of approaching adverse weather conditions and relay them to management personnel who will take appropriate action according to the provisions in the Emergency Response Plan[60].

(d) Flooding

A 950-meter long dike along the Housatonic protects the plant from flooding. The dike is 2.7 meters above mean high sea water level. Plant storm sewers discharge to six pump houses [paragraph C.1.a.(2)] along the dike.

(e) Pollution Spills

The oil abatement facility [paragraph C.1.a.(2)] provides a total oil spill prevention control and countermeasure plan for the facility[61].

There is no other specific spill abatement equipment located at SAEP[61]. In the event of a spill of a pollutant other than oil, a commercial clean-up contractor in Bridgeport, CT, will be called in to clean up the spill. At the completion of the clean up, AVCO Lycoming Division will submit a report to the State of Connecticut, DEP.

b. Probable Impact

Although the industrial safety and health program normally is envisioned as having litle impact beyond the confines of the installation, it should be clear from the above that an inadequate program could result in substantial, although often brief, environmental impact.

As it is, pesticide application at SAEP has beneficial impacts - reducing disease vectors in food handling areas and positively affecting the integrity of wooden structures and, hence, human safety.

The hearing conservation and industrial safety programs have a positive impact on employees as well as visitors that would otherwise be exposed to damaging noise levels or safety hazards.

The emergency programs have a positive impact by ensuring that fires will be controlled quickly, that adverse weather conditions will not result in pollutants being released to the environment in harmful concentrations and that spills of pollutants will be quickly contained before they can enter the environment.

SECTION D. LIST OF REFERENCES

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[2]All acronyms are listed and defined in Appendix A.

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[25]Dowham and Craig, Rare and Endangered Species of Connecticut and Their Habitat, 1976.

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[59]AVCO Lycoming Division, Stratford, CT, Emergency Response Plan, Dec 80.

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SECTION E. LIST OF AGENCIES AND PEOPLE CONTACTED

1. US Army Materiel Development and Readiness Command
   James Tragesser

2. US Army Troop Support and Aviation Materiel Readiness Command
   Mary Ann Evans
   Lou Chiodini
   Edward Vlatkovich

3. Defense Contract Administration Services Management Area-Bridgeport
   William Gillen
   LTC Clyde Gray
   Louis Mascullo
   Patrick Mineo
   Donald Page
   Edward Skawinski

4. AVCO Lycoming
   Louis Bogash
   Peter Bonitatebus
   Richard Euerle
   Donald Graham

5. Connecticut Department of Environmental Protection
   Fred Banach
   Douglass Cooper
   Mike Curtis
   Karen Hayward
   Robert Leach
   Arthur Mauger
   Victor Yanosky
   Sidney Querra

6. US Geological Survey Water Resources Division
   Thomas Shepard

7. Town of Stratford
   William McCann

8. Greater Bridgeport Regional Planning Agency
   Mary McDuffe

9. Regional Medical Detachment Activities, Fort Devens, MA
   MAJ Walter Jackson

SECTION F. CONCLUSION

SAEP is now or will soon be in compliance with all Federal, State, and local environmental regulations. Thus, environmental impacts from the operation of SAEP are insignificant. Consequently an Environmental Impact statement is not required.

APPENDIX A. LIST OF ACRONYMS

Acronym	Definition
AEHA	Army Environmental Hygiene Agency
$Al(OH)_3$	Aluminum hydroxide
APCC	Air Pollution Control Commission
AQCR	Air Quality Control Region
AR	Army Regulation
Aug	August
Bldg	Building
C	Celcius
CFR	Code of Federal Regulations
cm	centimeter
CO	Carbon monoxide
Cr	Chromium
CT	Connecticut
Cu	Copper
DA	Department of Army
DAR	Defense Aquisition Regulations
DARCOM	US Army Materiel Development and Readiness Command
DCASMA	Defense Contract Administration Services Management Area
DCASR	Defense Contract Administration Services Region
Dec	December
DEP	Department of Environmental Protection
DLA	Defense Logistics Agency
DPG	Dugway Proving Ground
ea	Each
EPA	Environmental Protection Agency

F	Farenheit
Fe	Iron
Feb	February
g	gram
GOCO	Government-owned. Contractor-operated
Hrs/wk	Hours per week
IEA	Installation Environmental Assessment
IWTP	Industrial Wastewater Treatment Plant
Jan	January
Jul	July
kg	kilogram
$KMNO_4$	Potassium permargonate
KF	Potassium Fluoride
km	kilometer
KOH	Potassium hydroxide
kW	kilowatt
Lt Col	Lieutenant Colonel
ℓ	liter
m	meter
MA	Massachusetts
Mar	March
MBtu	Million British thermal units
MG	Major General
mg	milligram
mg/ℓ	milligrams per liter
ml	milliliter
MO	Missouri

MOGAS	Mobile vehicle gasoline
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
Ni	Nickle
NPDES	National Pollutant Discharge Elimination System
No.	Number
NO_2	Nitrogen dioxide
Oct	October
PCB	Polychlorinated biphenyl
PL	Public Law
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
SAEP	Stratford Army Engine Plant
Sep	September
SO_2	Sulfur dioxide
TSP	total suspended particulates
US	United States
UT	Utah
TSARCOM	US Army Troop Support and Aviation Materiel Readiness Command
VA	Virginia
$\mu g/m^3$	micrograms per cubic meter
Zn	Zinc

APPENDIX B. CONVERSION FACTORS (METRIC TO ENGLISH)

Convert	to	Multiply by
Centimeters	Inches	0.3937
Cubic meters	Cubic feet	35.31
Grams	Ounces	0.03527
Hectare	Acres	2.471
Hectoliters	Bushels (U.S.)	2.8378
Kilograms	Pounds	2.205
Kilometers	Miles	0.6214
Knots	Kilometers/hour	1.853
	Miles/hour	1.152
Liters	Gallons	0.2642
Meters	Feet	3.281
Meters/second	Miles/hour	2.237
Milliliters	Ounces (fluid)	0.03382
Millimeters	Inches	0.03937
Metric tons	Tons (long)	0.9842
Square kilometers	Acres	247.1
	Hectares	100.0
	Square miles	0.3861
Square meters	Acres	2.471×10^{-4}
	Square feet	10.76
	Square yards	1.196
Celsius	Fahrenheit	$(C \times 9/5) + 32 = F°$

APPENDIX C. TENTATIVE LISTS OF FISHES, AMPHIBIANS, AND REPTILES

Petromyzontidae	
Sea lamprey	*Petromyzon marinus*
Anguillidae	
American eel	*Anguilla rostrata*
Clupeidae	
Alewife	*Alosa pseudoharengus*
American shad	*Alosa sapidissima*
Salmonidae	
Rainbow trout	*Salmo gairdneri*
Brook trout	*Salmo fontinalis*
Cyprinidae	
Goldfish	*Carassius auratus*
Common carp	*Cyprinus carpio*
Cutlips minnow	*Exoglossum maxillingua*
Golden shiner	*Notemigonus crysoleucas*
Bridle shiner	*Notropis bifrenatus*
Spottail shiner	*Notropis hunsonius*
Blacknose dace	*Rhinichthys atratulus*
Longnose dace	*Rhinichthys cataractae*
Creek chub	*Semotilus atromaculatus*
Fallfish	*Semotilus corporalis*
White sucker	*Catostomus commersoni*
Creek chubsucker	*Erimyzon oblongus*
Ictaluridae	
Yellow bullhead	*Ictalurus natalis*
Brown bullhead	*Ictalurus nebulosus*
Gadiformes	
Atlantic tomcod	*Microgadus tomcod*
Cyprinodontidae	
Sheephead minnow	*Cyprinodon variegatus*
Banded killfish	*Fundulus diaphanus*
Mummichog	*Fundulus heteroclitus*
Gasterosteidae	
Fourspine stickleback	*Apeltes quadracus*
Brook stickleback	*Culaea inconstans*
Ninespine stickleback	*Pungitius pungitius*
Percichthyidae	
White perch	*Morone americana*

Centrarchidae	
Redbreast sunfish	Lepomis auritus
Bluegill	Lepomis macrochirus
Smallmouth bass	Micropterus dolomicui
Largemouth bass	Micropterus salmoides
Percidae	
Tesselated darter	Etheostoma olmstedi
Walleye	Stizostedion vitreum
Lutjanidae	
Gray snapper	Lutjanus griseus
Sciaenidae	
Silver perch	Bairdiella chrysoura
Spotted seatrout	Cynoscion nebulosus
Spot	Leiostomus xanthurus
Atlantic croaker	micropogonias undulatus
Red drum	Sciaenops orellata
Gobiidae	
Naked goby	Gobiosoma bosci
Chelydridae	
Common snapping turtle	Chelydra serpentina
Testudinidae	
Wood turtle	Clemmys insculpta
Spotted turtle	Clemmys guttata
Chelydridae	
Stinkpot	Sternothaerus odoratus
Eastern mud turtle	Kinosternon subrubrum subrubrum
Testudinidae	
Northern diamondback terrapin	Malaclemys terrapin terrapin
Eastern painted turtle	Chrysemys picta picta
Eastern box turtle	Terrapene carolina carolina
Colubridae	
Northern red-bellied snake	Storeria occipitomacutata
Northern brown snake	Storeria dekayi dekayi
Northern water snake	Natrix sipedon sipedon
Eastern garter snake	Thamnophis sirtalis sirtalis
Eastern ribbon snake	Thamnophis sauritus sauritus
Eastern hognose	Heterodon platyrhinos
Eastern worm snake	Carphophis amoenus amoenus
Northern ringneck snake	Diadophis punctatus edwardsi
Northern black racer	Coluber constrictor constrictor
Eastern smoth green snake	Opheodrys vernalis
Black rat snake	Elaphe obsoleta obsoleta
Eastern milk snake	Lampropeltis coliata triangulum

Viperidae	
Northern copperhead	*Agkistrodon contortrix mokeson*
Timber rattlesnake	*Crotalus horridus horridus*
Proteidae	
Mudpuppy salamander	*Necturus maculosus*
Salamandridae	
Red-spotted newt	*Diemictylus viridescens viridescens*
Ambystomidae	
Jefferson salamander	*Ambystoma jeffersonianum*
Blue-spotted salamander	*Ambystoma laterale*
Spotted salamander	*Ambystoma maculatum*
Marbled salamander	*Ambystoma opacum*
Plethodontidae	
Northern dusky salamander	*Desmognathus fuscus fuscus*
Red backed salamander	*Plethodon cinereus cinereus*
Northern spring salamander	*Gyinophilus porphyriticus*
Four-toed salamander	*Hemidactylium scutatum*
Northern two-lined salamander	*Eurycea bislineata bislineata*
Pelobatidae	
Eastern spadefoot	*Scaphiopus holbrooki*
Bufonidae	
American toad	*Bufo americanus*
Fowlers toad	*Bufo woodhousei fowleri*
Hylidae	
Northern spring peeper	*Hyla crucifer*
Eastern gray treefrog	*Hyla versicolor*
Ranidae	
Northern leopard frog	*Rana pipiens pipens*
Pickerel frog	*Rana palustris*
Gree frog	*Rana clamitans melanota*
Wood frog	*Rana sylvatica*
Bullfrog	*Rana catesbeiana*

APPENDIX D. NATIONAL POLLUTION ELIMINATION DISCHARGE PERMIT FOR STRATFORD ARMY ENGINE PLANT

STATE OF CONNECTICUT

DEPARTMENT OF ENVIRONMENTAL PROTECTION

STATE OFFICE BUILDING HARTFORD, CONNECTICUT 06115

WATER COMPLIANCE UNIT
DIVISION OF ENVIRONMENTAL QUALITY
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OFFICE BUILDING
HARTFORD, CONNECTICUT 06115

NPDES PERMIT

AVCO,Lycoming Division and
Stratford Army Engine Plant
550 South Main St.
Stratford, Connecticut 06497

Attention: Mr. Joseph Bartos

Re: DEP/WPC-138-023
City of Stratford
Housatonic River Watershed

Gentlemen:

This order is authorized to be issued by Chapter 474a, Connecticut General Statutes and Section 402(b), Federal Water Pollution Control Act, as amended, 33 USC 1251, et. seq., and pursuant to an approval dated September 26, 1973, by the Administrator of the United States Environmental Protection Agency for the State of Connecticut to administer an N.P.D.E.S. permit program.

Your reapplication, filed with the Connecticut Department of Environmental Protection on January 3, 1977, has been reviewed by the Connecticut Department of Environmental Protection.

The Commissioner of Environmental Protection (hereinafter "the Commissioner") hereby finds that AVCO, Lycoming Division and Stratford Army Engine Plant is maintaining a facility described in the above-referenced application which no longer insures or adequately protects against pollution of the waters of the state under the provisions of Chapter 474a of the Connecticut General Statutes.

The Commissioner, acting under Section 25-54j, hereby orders Avco, Lycoming Division and Stratford Army Engine Plant to take such action as is necessary to:

1) Insure that all wastewaters described in the above-referenced application are collected, treated and discharged in accordance with the plans and specifications approved by the Director of Water Compliance on December 31, 1952 and June 30, 1970 together with associated engineering documents, correspondence and other data submitted to comply or obtained to verify compliance with Order No. 0923 entered on March 15, 1971, and/or discharged in accordance with this order.

2) Insure that all discharges described in this order shall not exceed and shall otherwise conform to the specific terms and general conditions specified herein.

A) Discharge Serial No. 001, 002, 003, 004, 005, 006 -(Storm water overflows-wet weather)
Receiving Stream - Housatonic River
Average Daily Flow - (Wet weather) - Intermittent.
Average Daily Flow - (Dry weather) - There will be no discharge from these outfalls during dry weather conditions.

Parameter	Maximum Daily Concentration	Average Daily Concentration
Oil & Grease	15.0 mg/l	10.0 mg/l
Phenols	0.2 mg/l	0.1 mg/l
Total Suspended Solids	30.0 mg/l	20.0 mg/l

1) The pH of the discharge shall not be less than 6.0 or greater than 9.5.

2) The discharge shall not contain a visible oil sheen, foam or floating solids.

3) The discharge shall not contain more than 0.1 milliliters per liter settleable solids.

4) The discharge shall not cause visible discoloration of the receiving waters.

5) The temperature of the discharge shall not increase the temperature of the receiving stream above (85°F) (83°F - tidal) or raise the normal temperature of the receiving stream more than 4°F.

6) The average and maximum concentrations specified above may be changed upon modification or reissuance of this permit in accordance with the reopener clause on Page 6 .

B) Discharge Serial No. 007 (Oil & grease treatment plant effluent).
Receiving Stream - Housatonic River
Average Daily Flow-4 MGD

Parameter	Average Daily Quantity	Maximum Daily Concentration	Average Daily Concentration
Oil & Grease	151.40 kg/day	15.0 mg/l	10.0 mg/l
Phenols	1.51 kg/day	0.2 mg/l	0.1 mg/l
Total Suspended Solids	302.80 kg/day	30.0 mg/l	20.0 mg/l

1) The pH of the discharge shall not be less than 6.0 or greater than 9.5.

2) The discharge shall not contain a visible oil sheen, foam or floating solids.

3) The discharge shall not contain more than 0.1 milliliters per liter settleable solids.

4) The discharge shall not cause visible discoloration of the receiving waters.

5) The temperature of the discharge shall not increase the temperature of the receiving stream above 85°F or raise the normal temperature of the receiving stream more than 4°F.

6) The average and maximum concentrations specified above may be changed upon modifiction or reissuance of this permit in accordance with the reopener clause on Page 6.

C) Discharge Serial No. 008 - (Metal finishing wastewater treatment plant effluent).
Receiving Stream - Housatonic River
Average Daily Flow - 192,000 GPD; average rate - 400 GPM
Maximum Daily Flow - 216,000 GPD; maximum rate 450 GPM

Parameter	Average Daily Quantity	Maximum Daily Concentration	Average Daily Concentration
Copper	0.73 kg/day	1.50 mg/l	1.0 mg/l
Cyanide Total	0.73 kg/day	1.50 mg/l	1.0 mg/l
Cyanide Amenable	0.07 kg/day	0.15 mg/l	0.1 mg/l
Chromium - Hexavalent	0.07 kg/day	0.15 mg/l	0.1 mg/l
Chromium Total	0.73 kg/day	1.50 mg/l	1.0 mg/l
Nickel	0.73 kg/day	1.50 mg/l	1.0 mg/l
Zinc	0.73 kg/day	1.50 mg/l	1.0 mg/l
Cadmium	0.07 kg/day	0.5 mg/l	0.1 mg/l
Iron	1.46 kg/day	3.00 mg/l	2.0 mg/l
Total Suspended Solids	7.30 kg/day	20.0 mg/l	10.0 mg/l

1) The pH of the discharge shall not be less than 6.0 or greater than 9.5.

2) The discharge shall not contain a visible oil sheen, foam or floating solids.

3) The discharge shall not contain more than 0.1 milliliters per liter settleable solids.

4) The discharge shall not cause visible discoloration of the receiving waters.

5) The temperature of the discharge shall not increase the temperature of the receiving stream above 85°F or raise the normal temperature of the receiving stream more than 4°F.

6) The average and maximum concentrations specified above may be changed upon modification or reissuance of this permit in accordance with the reopener clause on Page 6.

3) Not discharge any new pollutant not authorized by this order which has or may have an adverse impact on the receiving waters.

4) Monitor and report to the Director of Water Compliance by the 10th of each month the following for the purpose of reporting quality and quantity of each discharge according to the following schedule:

A) Discharge Serial No. 001, 002, 003, 004, 005, and 006

Parameter	Minimum Frequency of Sampling	Sample Type
Oil & Grease	Monthly (if discharge occurs)	Grab
Phenols	Monthly	Grab
Total Suspended Solids	Monthly	Grab
pH	Monthly	Range during grab

1) Record the total flow for the day of sample collection.

2) Grab samples shall be taken every 15 minutes up to a period of one hour. The concentration reported shall be the arithmetic mean of the individual grab samples.

3) The monitoring report shall include a detailed explanation of any deviations from the limits specified in paragraph 2 and the corrective action taken to achieve compliance.

B) Discharge Serial No. 007

Parameter	Minimum Frequency of Sampling	Sample Type
Oil & Grease	Monthly	Composite
Phenols	Monthly	Composite
Total Suspended Solids	Monthly	Composite
pH	Monthly	Range during composite

1) Record the total flow for the day of composite sample collection.

2) The monitoring report shall include a detailed explanation of any deviation from the limits specified in paragraph 2 and the corrective action taken to achieve compliance.

C) Discharge Serial No. 008

Parameter	Miniumum Frequency of Sampling	Sample Type
Copper	Monthly	Composite
Cyanide Total	Monthly	Composite
Cyanide Amenable	Monthly	Composite
Chromium Hexavalent	Monthly	Composite
Chromium Total	Monthly	Composite
Nickel	Monthly	Composite
Zinc	Monthly	Composite
Cadmium	Monthly	Composite
Iron	Monthly	Composite
Total Suspended Solids	Monthly	Composite
pH	Monthly	Range during eomposite

1) Record the total flow for the day of composite sample collection.

2) The monitoring report shall include a detailed explanation of any deviations from the limits specified in paragraph 2 and the corrective action taken to achieve compliance.

5) Not bypass the treatment facilities or any part thereof at any time. If any part of the waste treatment facilities becomes inoperable at any time, the Water Compliance Unit shall be notified immediately. A written report shall follow, giving the cause of the problem, duration and corrective measures taken.

6) Dispose of screenings, sludges and other solids or oils and other liquid chemicals at locations approved in accordance with the provisions of Chapter 474a and/or Chapter 361a of the Connecticut General Statutes or to waste haulers licensed under Chapter 474a of the Connecticut General Statutes.

7) Provide an alternate power source adequate to operate the treatment facilities and/or such other means as may be appropriate to insure that no discharge of untreated or partially treated wastewater will occur during a failure of the primary power source.

8) On or before May 31, 1980 verify to the Commissioner that compliance with paragraph 1 is being achieved and that the provisions of paragraphs 2, 3, 4, 5, 6 and 7 will be complied with.

9) On or before June 30, 1980 submit for the review and approval of the Commissioner a report detailing the existing or proposed system of achieving compliance with the terms of paragraph 7 including if appropriate a time schedule for 1) the submission of plans and/or specifications, 2) the start of construction, and 3) the placing of the system in operation.

10) On or before May 31, 1980 and monthly thereafter submit to the Director of Water Compliance all detailed monitoring data required under the provisions of paragraph 4 above.

11) On or before October 31, 1980 verify to the Commissioner that all construction required by paragraph 7 above has been completed.

The above-described specific terms may be revised following public notice and public hearing, if required, on the basis of a detailed engineering study if agreed to by the Commissioner.

AVCO Lycoming Division and Stratford Army Engine Plant is further ordered to accomplish the above-described program, except as may be revised by the recommendations of a detailed engineering study and agreed to by the Commissioner in accordance with the following schedule:

A) On or before August 31, 1980 submit for the review and approval of the Commissioner an engineering report which shall include the following information:

1) A description of additional treatment facilities and/or alterations in operating procedures as may be required to assure compliance with the specific terms of paragraph 2 above and/or any applicable Federal and/or State guidelines which may be promulgated subsequent to the issuance of this permit.

2) The means by which the total quantity of pollutants discharged will be minimized through the use of water conservation measures.

3) A description of the quantity and quality of all nondomestic discharges to the sanitary sewer, treatment presently provided, and any modifications necessary to improve the quality of the discharges.

4) A description of present sludge disposal practices, including the quantity generated, means of drying, ultimate disposal site, and waste hauler (if appropriate).

5) A comprehensive evaluation of all operation and maintenance procedures including but not limited to the following: manpower requirements, operator training, equipment maintenance schedules, treatment chemical inventory practices, operational monitoring and recordkeeping procedures.

6) The means by which proper sampling, preservation, analysis and flow measurement of the discharges will be assured.

B) On or before October 31, 1980 submit for the review and approval of the Commissioner construction plans and specifications accompanied by a summary basis of design for such additional treatment facilities.

C) On or before December 31, 1980 verify to the Commissioner that the construction of such additional treatment facilities has been started.

D) On or before August 31, 1981 verify to the Commissioner that such additional treatment facilities have been placed in operation.

This order shall be considered as the permit required by Section 402 of the Federal Water Pollution Control Act and shall expire on May 20, 1985.

This order shall be subject to all the NPDES General Conditions dated April 27, 1979 which are hereby incorporated into this order.

Upon verification of full compliance with this order, a letter acknowledging this order to be equivalent of a permit issued under Section 25-54i and/or a revised NPDES permit will be issued.

This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2) (C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

Entered as an order of the Commissioner on the 20th day of May, 1980.

Stanley J. Pac
Stanley J. Pac
COMMISSIONER

ORDER No. 2453
NPDES No. CT0002984
Application No. 07y003000112

NPDES GENERAL CONDITIONS

These general conditions apply to all orders or permits issued by the Department of Environmental Protection which are considered NPDES Permits under the provisions of Section 402 of the Federal Water Pollution Control Act.

1. Any person or municipality wishing to initiate, create or originate any new discharge of water, substance or material into the waters of the State of Connecticut shall file an application for a permit which shall include a complete NPDES application no later than 180 days in advance of the date on which it is desired to commence the discharge.

2. Any application filed in accordance with condition (1) shall be signed as follows:

(a) In the case of corporations, by a principal executive officer of at least the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates.

(b) In the case of a partnership, by a general partner.

(c) In the case of sole proprietorship, by the proprietor.

(d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official or other duly authorized employee.

3. The recipient of any order or permit shall immediately notify the Commissioner of the Department of Environmental Protection (hereinafter "the Commissioner") and the Regional Administrator of the Environmental Protection Agency when it is known that any interim or final requirement of the order or permit will not be complied with and the reasons therefor. The Commissioner may require the filing of a written statement itemizing the reasons for non-compliance.

4. All discharges authorized by any order or permit shall be consistent with the terms and conditions of the order or permit.

5. Facility expansion, production increases or process modification which may result in new or increased discharges of water, substance or material to the waters of the State of Connecticut must be authorized by the issuance of a new or revised permit or order prior to being initiated, created or originated unless such discharges do not violate the terms and conditions of an existing order or permit.

(a) If a new or increased or decreased discharge of water, substance or material to the waters of the State of Connecticut does not violate the terms and conditions of the existing order or permit, notice of such new or increased or decreased discharge shall be sent to the Commissioner and the Regional Administrator of the Environmental Protection Agency.

(b) If the new or increased discharge of water, substance or material will violate the terms and conditions of an existing order or permit, an application shall be filed in accordance with condition (1).

6. The discharge of water, substance or material more frequently than, or at a level in excess of the terms and conditions of any existing order or permit shall constitute a violation of the terms and conditions of the order or permit.

7. Any order or permit may be modified, revoked, or suspended in accordance with applicable federal and state statutes, regulations and other administrative procedures in whole or part during its term for cause including, but not limited to, the following:

(a) Violation of any term or condition of the order or permit;

(b) Obtaining an order or permit by misrepresentation or failure to disclose fully all relevant facts; and

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the discharge.

8. The Commissioner or the Regional Administrator of the Environmental Protection Agency or their authorized representatives, on presentation of credentials shall be permitted:

(a) To enter upon the premises in which the effluent source is located or in which any records are required to be kept under the terms and conditions of the order or permit;

(b) To have access to and copy any records required to be kept under the terms and conditions of the order or permit;

(c) To inspect any monitoring equipment or method required in the order or permit; or

(d) To sample any discharge of water, substance or material to the waters of the State of Connecticut.

9. The recipient of any order or permit shall at all times maintain in good working order, and operate as efficiently as possible, any facility or systems of control installed to achieve compliance with the terms and conditions in the order or permit.

10. If a toxic effluent standard or prohibition including any schedule of compliance specified in such effluent standard or prohibition is established under Section 307(a) of the Federal Water Pollution Control Act for a toxic pollutant which is present in any discharge of water, substance or material to the waters of the State of Connecticut and such standard or prohibition is more stringent than any term or condition of an order or permit the Commissioner shall revise or modify that order or permit in accordance with the toxic effluent standard or prohibition and so notify the permittee.

11. Any recipient of an order or permit who wishes to continue to discharge water, substance or material to the waters of the State of Connecticut after the expiration date of the order or permit shall file for a reissuance of the order or permit on a form prescribed by the Commissioner which shall include a complete NPDES application no less than 180 days in advance of the date of expiration.

12. The recipient of any order or permit shall;

(a) Maintain records of all information resulting from any monitoring program contained in the terms and conditions of the order or permit.

(b) Identify in the monitoring records 1) the date, the exact place and the time of sampling; 2) the dates analyses were performed; 3) who performed the analyses; 4) the analysis techniques and methods used; 5) the results of such analysis;

(c) Retain for a minimum of three years, or longer if specifically required by the Commissioner, any records of monitoring activities and results including all original strip chart readings from continuous monitoring instrumentation and calibration and maintenance records;

(d) Report on forms prescribed by the Commissioner the monitoring results obtained in accordance with specified terms and conditions of any order or permit.

13. For the purpose of complying with the monitoring requirements prescribed in the terms and conditions of any order or permit, the sampling, preservation, handling and analytical methods used must conform to the following references methods, latest edition. However, different but equivalent methods are allowed if they receive prior written approval of the Commissioner.

(a) Standard Methods for the Examination of Water and Wastewaters, 13th Edition, 1971, American Public Health Association, New York, New York 10019

(b) A.S.T.M. Standards, Part 23, Water; Atmospheric Analysis, 1970; American Society of Testing and Materials, Philadelphia, Pennsylvania 19103, or

(c) Methods for Chemical Analysis of Water and Wastewaters, April 1971, Environmental Protection Agency, Water Quality Office, Analytical Water Quality Control Laboratory, 1014 Broadway, Cincinnati, Ohio 45268

14. Abbreviations and Definitions

mg/l - milligrams per liter

lbs/day - pounds per day

kg/day - kilograms per day

Composite Sample - 1) Industrial wastewaters - A mixture of aliquot samples obtained at regular intervals over a time period. The volume of each individual aliquot shall be proportional to the discharge flow rate or the sampling interval (for constant volume samples) shall be proportional to the flow rate over the time period used to obtain the composite. A composite sample shall contain at least four aliquot samples collected over a four-hour period. 2) Municipal and sanitary wastewater - A sample consisting of a minimum of eight grab samples collected at equal intervals of no less than 30 minutes during a 24-hour period and combined proportional to flow, or a sample continuously collected proportionally to flow over that same time period.

Grab Sample - An individual sample collected in less than 15 minutes.

Range During Composite - The maximum and minimum values of a parameter observed in the aliquot samples used to make a composite sample.

Four-Hour Average - The average of a minimum of four measurements obtained at regular intervals during composite sample collection.

Average - The arithmetic average

Daily Average - The average of a minimum of eight measurements obtained at regular intervals over an operating day.

Average Daily Concentration - The average concentration during a 24-hour period of an operating day. The minimum procedure for determining the average daily concentration will be a four-hour composite.

Maximum Concentration - Maximum concentration at any time as determined by a grab sample.

Average Daily Flow - The average flow rate during an operating day.

Average Daily Quantity - The average quantity of waste generated during an operating day.

Monthly Average - The average of a minimum of twelve composite samples taken on twelve separate days, or at least one grab sample per day, taken on twelve separate days, as required for the parameter being reported within a calendar month.

Weekly Average - The average of a minimum of three composite samples taken on three separate days, or at least one grab sample per day, taken on three separate days, as required for the parameter being reported within a week.

Maximum Daily Quantity - The maximum quantity of waste generated during a 24-hour period.

Cooling Water - Water used for cooling purpose only, which contains heat, but which has no direct contact with any product or raw material.

Metal Concentration - All metal concentrations are expressed as total metal concentrations.

Cyanide - Cyanide which is amendable to destruction by chlorine.

APPROVED Stanley J. Pac DATE 4/27/79

Stanley J. Pac
COMMISSIONER
DEPARTMENT OF ENVIRONMENTAL PROTECTION

D-11

APPENDIX E. HAZARDOUS WASTE PERMIT (RCRA) FOR STRATFORD ARMY ENGINE PLANT

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

GENERAL

F CTD001181502 ID

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

LABEL ITEMS

I. EPA I.D. NUMBER: CTD001181502

III. FACILITY NAME: AVCO CORPORATION

V. FACILITY MAILING ADDRESS: 550 MAIN ST, STRATFORD, CT 06497

VI. FACILITY LOCATION: 550 MAIN ST, STRATFORD, CT 06497

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		N.A.
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

C 1 SKIP: AVCO LYCOMING STRATFORD ARMY ENGINE PLNT

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
C 2 BONITATEBUS PETER CHF PLT UTIL	203 378 8211

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: C 3 550 SOUTH MAIN STREET

B. CITY OR TOWN	C. STATE	D. ZIP CODE
C 4 STRATFORD	CT	06497

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: C 5 550 SOUTH MAIN STREET

B. COUNTY NAME: FAIRFIELD

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
C 6 STRATFORD	CT	06497	

CONTINUE ON REVERSE

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
3724 (specify) JET ENGINES	3519 (specify) TANK ENGINES

C. THIRD	D. FOURTH
(specify) —	(specify) —

VIII. OPERATOR INFORMATION

A. NAME: AVCO CORPORATION

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☒ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)

P (specify) —

D. PHONE (area code & no.): A 203 552 1800

E. STREET OR P.O. BOX: 1275 KING STREET

F. CITY OR TOWN: B GREENWICH

G. STATE: CT

H. ZIP CODE: 06830

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	B. PSD (Air Emissions from Proposed Sources)
9 N CT0002984	9 P N.A.

C. UIC (Underground Injection of Fluids)	D. OTHER (specify)	(specify)
9 U N.A.	9 CT0178 Series	CT. D.E.P. APCC

E. RCRA (Hazardous Wastes)	F. OTHER (specify)	(specify)
9 R FORM 3	9	—

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

ENGINE MAUUFACTURE

MACHINING, FINISHING, ASSEMBLY AND TESTING.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
D. H. Carpenter, Vice President Industrial Resources & Planning	David H. Carpenter	11/13/80

COMMENTS FOR OFFICIAL USE ONLY

EPA I.D. Nº CT D00118150 2 AVCO LYCOMING

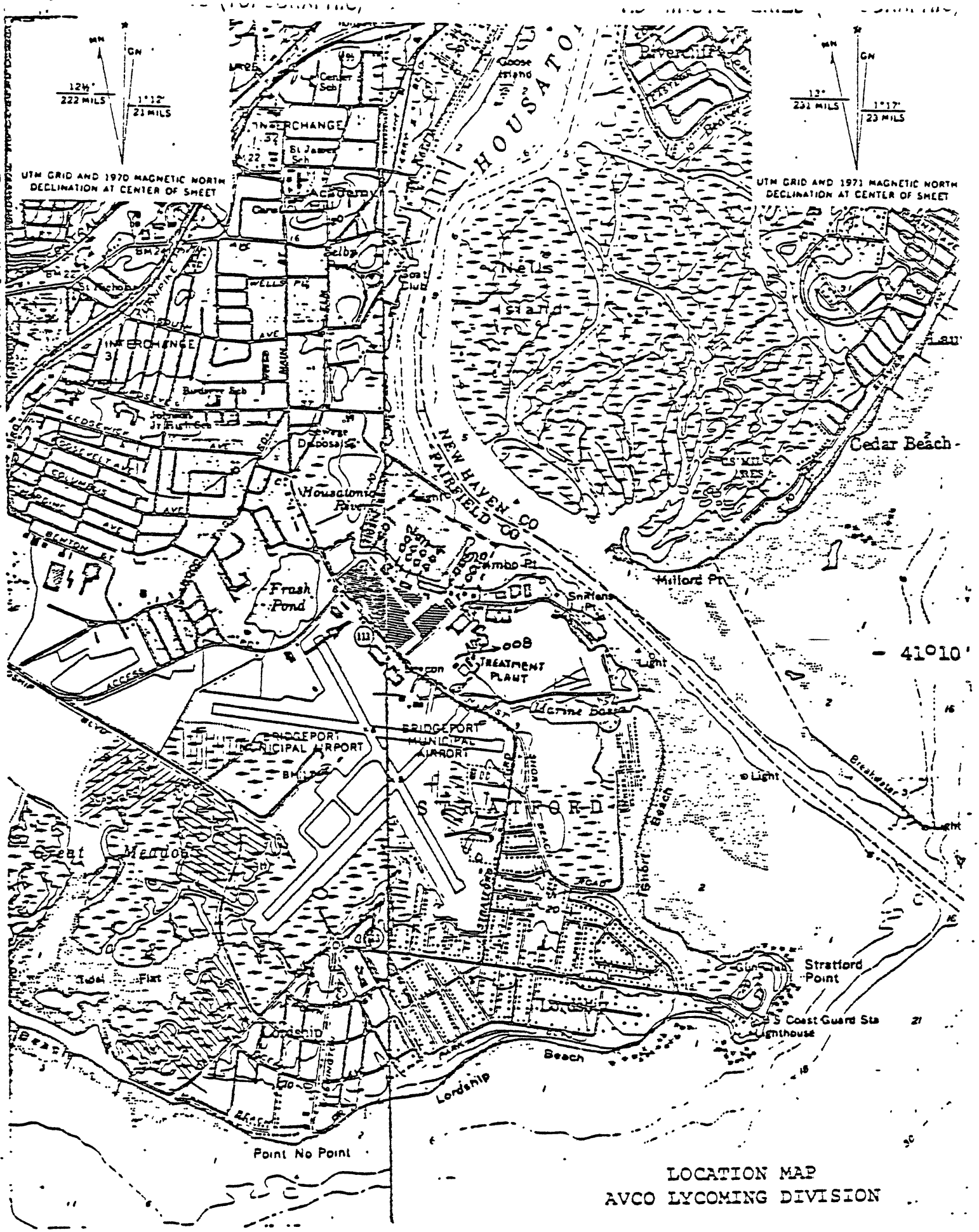
FORM 1 ITEM X - EXTENSION

EXISTING ENVIRONMENTAL PERMITS

CT. D.E.P. - APCC

REGISTRATION NUMBERS

0178 - 0087
" - 0090 THRU 0097
" - 0116
" - 0180
" - 0181
" - 0183 THRU 0212
" - 0271 THRU 0286
" - 8001



LOCATION MAP
AVCO LYCOMING DIVISION

EPA RCRA

Consolidated Permits Program
(This information is required under Section 3005 of RCRA)

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (*mark one box only*) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION (*place an "X" below and provide the appropriate date*)

[X] 1. EXISTING FACILITY (*See instructions for definition of "existing" facility. Complete item below.*)

FOR EXISTING FACILITIES PROVIDE THE DATE (*yr., mo., & day*) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (*use the boxes to the left*)

YR	MO	DAY
58		

[ ] 2. NEW FACILITY (*Complete item below.*)

FOR NEW FACILITIES, PROVIDE THE DATE (*yr., mo., & day*) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR	MO	DAY

B. REVISED APPLICATION (*place an "X" below and complete Item I above*)

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (*including its design capacity*) in the space provided on the form (*Item III-C*).

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.
1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage		
CONTAINER (*barrel, drum, etc.*)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET (*the volume that would cover one acre to a depth of one foot*) OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (*Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided, Item III-C.*)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	G

EXAMPLE FOR COMPLETING ITEM III (*shown in line numbers X-1 and X-2 below*): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP N/A 1

LINE NUMBER	A. PROCESS CODE (*from list above*)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (*specify*)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (*enter code*)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (*from list above*)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (*enter code*)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
1	S01	6050	G		7				
2	S04	908,940	G		8				
3	T01	504,000	U		9				
4					10				

CONTINUE ON REVERSE

INCLUDE DESIGN CAPACITY.

V. DESCRIPTION OF HAZARDOUS WASTES

EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous waster which are not listed in 40 CFR, Subpart D, enter the four-digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste*(s)* that will be handled which possess that characteristic or contaminant.

UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1), and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

EPA I.D. NUMBER (enter from page 1)

W	C	T	D	0	0	1	1	8	1	5	0	2	F/A	C
														1

W	DUP	F/A	C	DUP
			2	

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	F001	24.8	T	S01	
2	F007	192,150	T	S04 T01	
3	F009				INCLUDED WITH LINE 2
4	F006	1000	T	S04	
5	F006	40	T	S02	
6	F008	1,100	P	S01	
7	F017	300	P	S01	
8					
9		The following wastes are presently held in the			
10		"Container Storage Area" - The type and amount of wastes ---			
11		in this area will vary from year to year.			
12	U031	4	T	S01	
13	U013			S01	INCLUDED WITH LINE 12
14	D002			S01	INCLUDED WITH LINE 12
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

CONTINUE ON REVERSE

USE THE SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. (enter from page 1)

F | C T D 0 0 1 1 8 1 5 0 2 | T/A | C

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas, and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)
41 10 03 0	07 3 07 03 0

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)
E US Army Troop Support & Aviation Materiel Readiness Command	314-263-2201

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 4300 Goodfellow Boulevard	G St. Louis	MO	63120

IX. OWNER CERTIFICATION

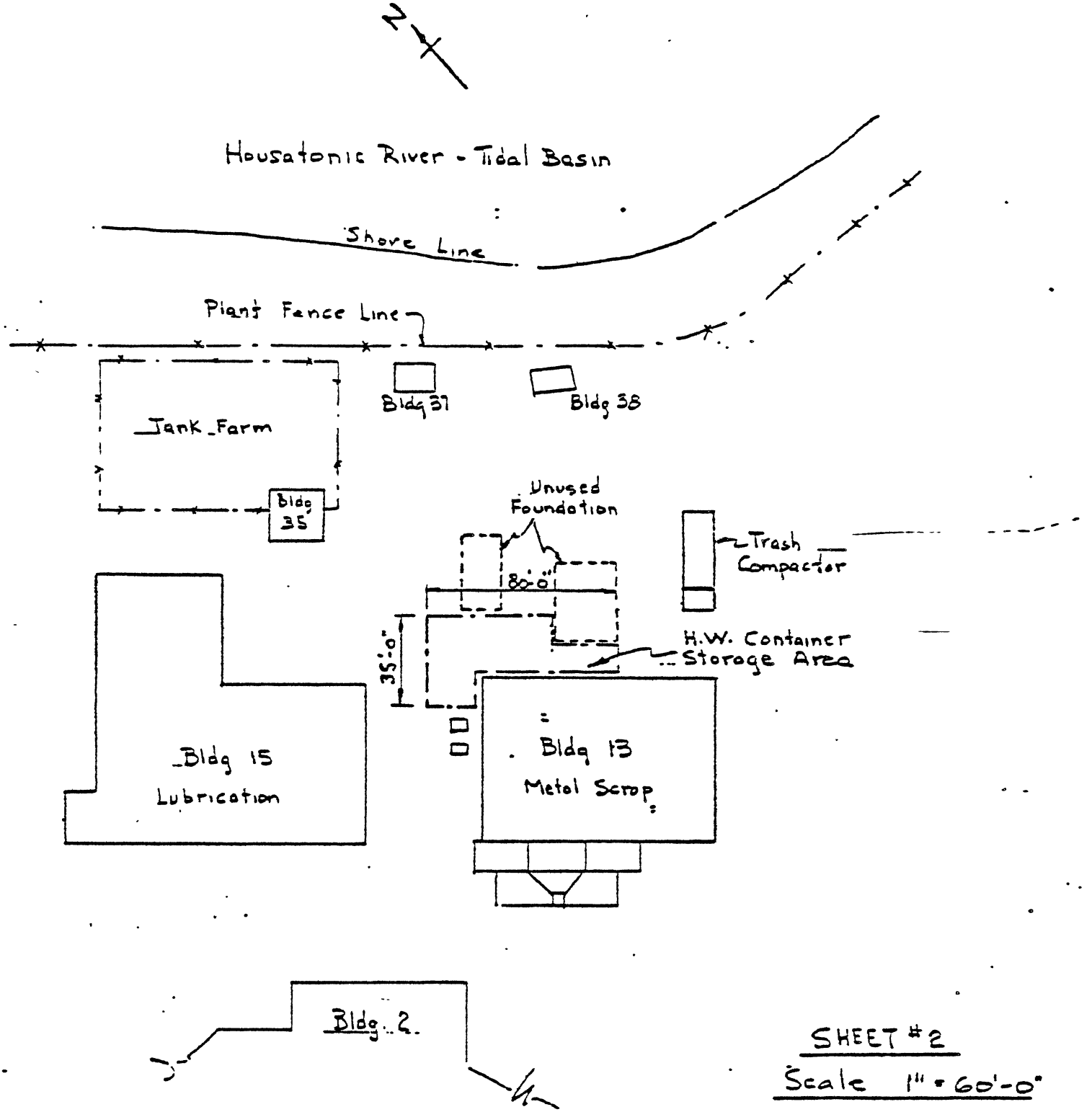
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
EMIL L. KONOPNICKI Major General, USA, Commanding	Emil L. Konopnicki	11/15/80

X. OPERATOR CERTIFICATION

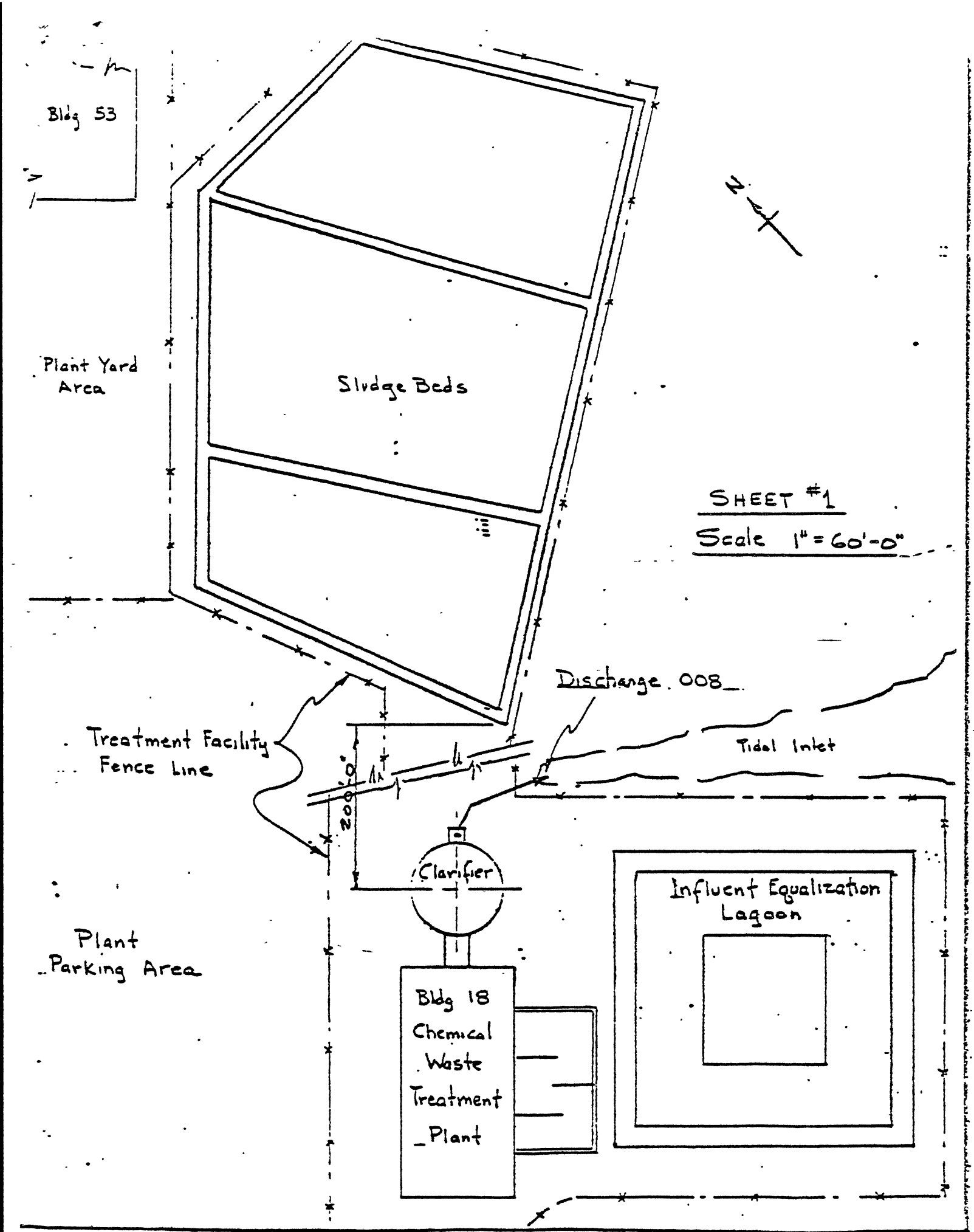
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

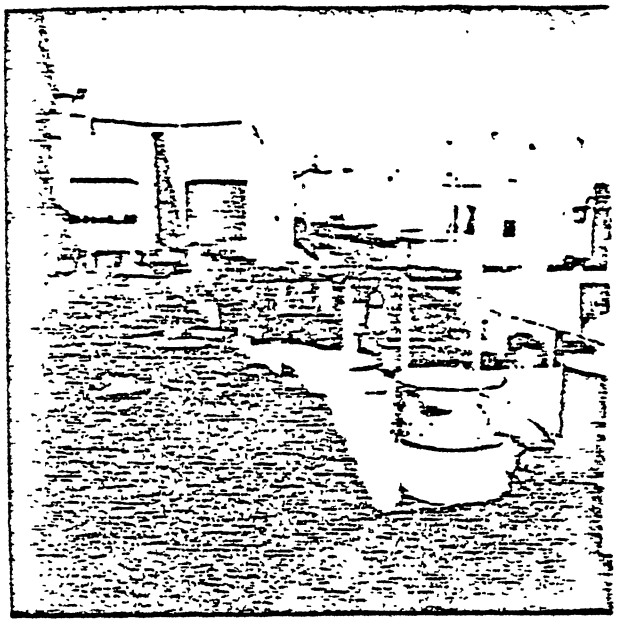
A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
D. H. Carpenter, Vice President Industrial Resources & Planning	David H. Carpenter	11/13/80



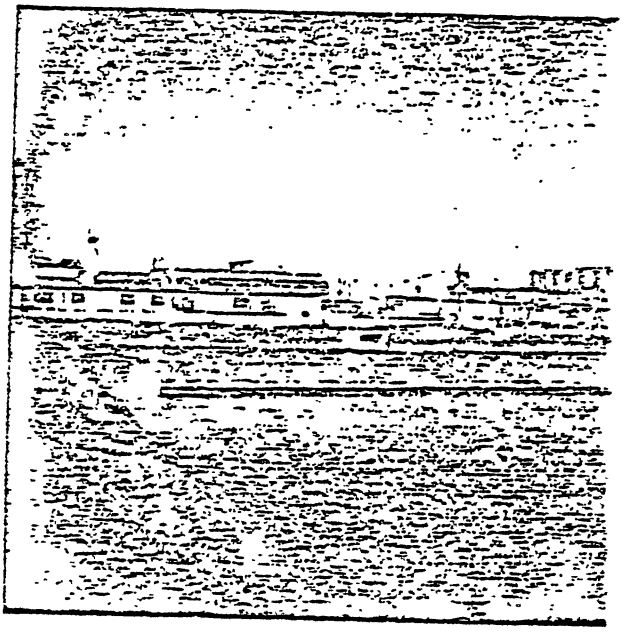
SHEET #2

Scale 1" = 60'-0"

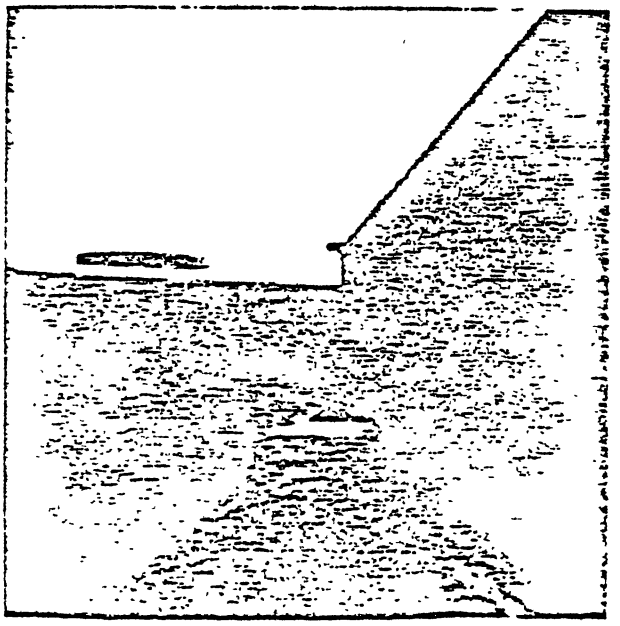

Bldg 53
Plant Yard Area
Sludge Beds
N
SHEET #1
Scale 1" = 60'-0"
Discharge 008
Treatment Facility Fence Line
Tidal Inlet
200'
Clarifier
Influent Equalization Lagoon
Plant Parking Area
Bldg 18 Chemical Waste Treatment Plant



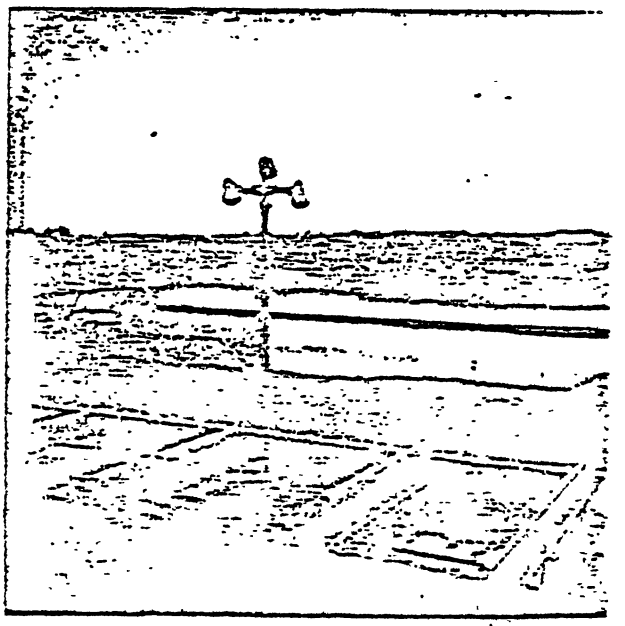
Container Storage Area
Looking Northwest



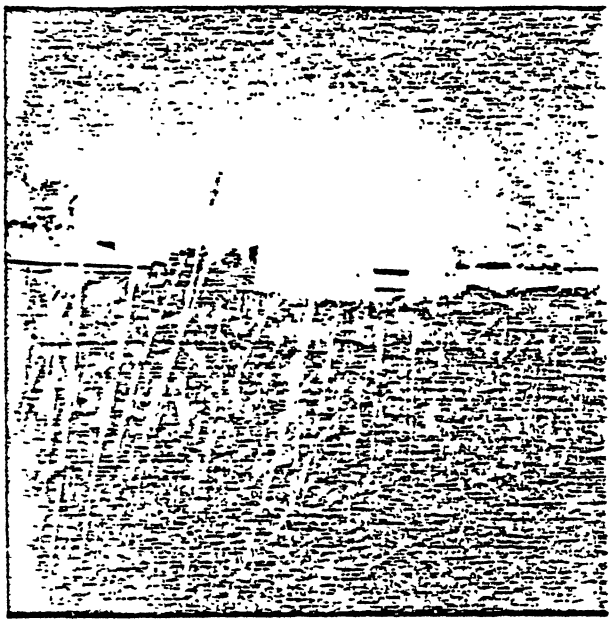
Chemical Treatment Plant
Looking North
Lagoon in Foreground



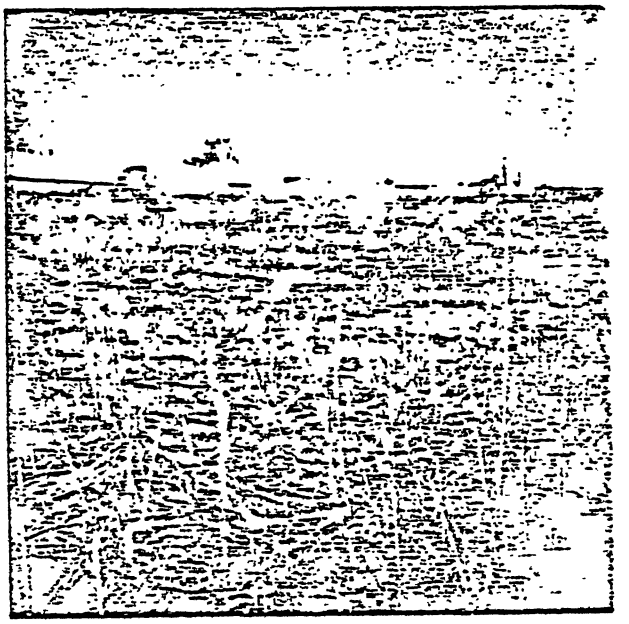
Container Storage Area
Looking Southeast



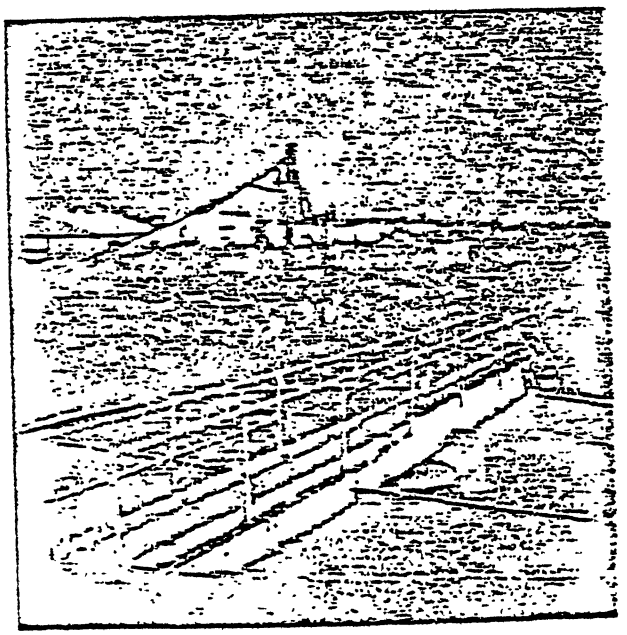
Equalization Lagoon
Looking East
Treatment Tanks in Foreground



Sludge Bed #1
Looking Northeast



Sludge Bed #3
Looking Northeast



Sludge Beds
Looking Northeast
Final Clarifier in Foreground

RCRA PERMIT APPLICATION

PART A, APPLICATION FORM-3, ADDENDUM

AVCO-SAEP EPA I.D. # CTD001181502

Basis for Solid Waste Classification

1. Wastes generated on a continuing basis were evaluated in accordance with 40 CFR Part 261 "Identification and Listing of Hazardous Wastes".

Identified wastes which were listed on the Part A Permit Application were:-

a. Spent, 1-1-1 Trichloroethane degreasing solvent, stored in 55 gallon drum containers, until sent for reclaiming. Listed in accordance with 40 CFR Part 261.6(b).

b. Paint sludge from paint booth operations. Stored in 55 gallon drum container until shipped for disposal. See 40 CFR Part 261.31.

c. Plating Tank Sludges. Stored in 55 gallon drum containers until shipped for disposal.
See 40 CFR Part 261.31

- Form-3 Addendum -

d. Waste plating, stripping and rinse solutions, surface impounded and treated in Chemical Treatment Plant.
See 40 CFR Part 261.31.

e. Chemical Treatment Plant calcium carbonate and heavy metal sludge. Cleaned from treatment tanks and shipped off-site for disposal.
See 40 CFR Part 261.31.

f. Plating Waste Sludge held in surface impoundment until shipped off-site for disposal.
See 40 CFR Part 261.31.

2. Other wastes that are generated on a continuing basis but were not listed as hazardous on the Part A Permit Application were:-

a. Lubricating and Cutting Oil Waste.
See 40 CFR Part 261 Preamble Appendix B.

b. 'Varsol' petroleum derivitive degreaser, which is reclaimed.
See 40 CFR Part 261.6(a)(2)

c. ECM Sludge, EDM Sludge and Plazma Spray Sludge. Each tested for characteristics of EP Toxicity as per 40 CFR Part 261.24 and found to be non-toxic.

d. Grinding sludge with filter paper and Collected Dust from dry dust collectors at grit blasting cleaning stations. Determined as non-hazardous as per 40 CFR Part 262.11(c)(2).

e. Magnesium, Zirconium and Thorium Nickel machining scrap. These solids are reclaimed. See 40 CFR Part 261.6(a)(2).

f. Drum containers for delivering the commercial chemicals Copper Cyanide and Sodium Cyanide. These containers when empty are identified as hazardous waste. However, this program will propose that all such containers be triple rinsed with water as soon as the contents are removed. This will allow the containers to be classed as non-hazardous. See 40 CFR Part 261.33(c)(1).

g. Oil Abatement Plant Sludge. Stored in tank until shipped off-site for disposal. See 40 CFR Part 262.11(c)(2).