INTERSTATE SANITATION COMMISSION

1968

NEW YORK NEW JERSEY CONNECTICUT

1 9 6 8

R e p o r t

of the

INTERSTATE SANITATION COMMISSION

on the
Water Pollution Control Activities
and the
Interstate Air Pollution Program

INTERSTATE SANITATION COMMISSION

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Assistant Secretary

*Resigned on December 16, 1968

INTERSTATE SANITATION COMMISSION

10 COLUMBUS CIRCLE • NEW YORK, N. Y. 10019

AREA CODE 212-582-0380

January 20, 1969

To His Excellency, Richard J. Hughes
His Excellency, Nelson A. Rockefeller
His Excellency, John N. Dempsey
and the Legislatures of the States of New York, Connecticut and New Jersey

Sirs:

The Interstate Sanitation Commission respectfully submits its report for the year 1968.

The members of the Commission are confident that with the continued active interest and support of the Governors and the members of the Legislatures, the Commission will maintain active and effective water and air pollution programs.

Respectfully submitted,

Natale Colosi

For the State of New York — Chairman

J. Louis Radel

For the State of Connecticut — Vice Chairman

Louis J. Fontenelli

For the State of New Jersey — Vice Chairman

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C O N T E N T S

APPENDIX A - Sewage Treatment Plants Discharging into the Interstate Sanitation District

APPENDIX B - Highlights of Interstate Sanitation Commission-- Water Pollution Abatement Activities (1936-1967)

ILLUSTRATIONS

I. SUMMARY OF ACTIVITIES

The Interstate Sanitation Commission was created in 1936 for the purpose of enforcing the provisions of the Tri-State Compact for Water Pollution Abatement. This Commission was solely concerned with water pollution until 1962 when funds were first granted for the development of an air pollution control program. Annual reports are prepared each year for the purpose of providing a record of the Commission's activities and of water pollution control work in the Interstate Sanitation District. These reports are submitted to the Governors and Legislatures of New York, New Jersey and Connecticut.

WATER POLLUTION

During 1968, a great deal of planning and construction was underway to provide a minimum of 80 per cent biochemical oxygen demand removal to all waste water effluents discharging to District Waters. This goal was agreed to by all agencies with jurisdiction in the New York Metropolitan Area at the Raritan Bay and Hudson River Pollution Abatement Conferences which were held during 1967. Money now designated to be spent for water pollution control work in the Interstate Sanitation District amounts to more than $945,756,453 for the 1,775,160,000 gallons per day of waste water now being discharged.

Many of the treatment facilities in the Interstate Sanitation District received orders during 1967 to upgrade to secondary treatment. Time schedules call for most of this work to be completed during 1970. A number of treatment plants and industries which have proceeded to develop their own effluent improvement programs are to be highly commended. New York City is constructing a treatment facility to handle storm overflows from combined sewers into Jamaica Bay. A study is simultaneously underway to determine the expected improvement in bacterial quality on the receiving waters with the hope that the beaches can again be opened for bathing.

The Commission sponsored an Interstate Conference on Boat Pollution in April 1968. Participating were representatives of state, local, federal and interstate agencies and other persons with interests in boating. The conference provided an opportunity for all parties to express their views regarding the magnitude of this pollution and the means of and problems concerned with eliminating it.

The Commission is expanding its water pollution abatement activities and a detailed account is given later in this Annual Report.

Interesting biological studies are also included in this Report.

AIR POLLUTION

The Commission began its activities in air pollution control for the year 1968 with the expectation of terminating these activities within a few months. This was to be done as soon as the Mid-Atlantic States Air Pollution Control Commission became an operational agency. For this reason no long range projects were initiated and efforts were directed towards the phasing out of all programs with the exception of coordination of the alert system and day to day air pollution complaint follow-ups and data collection. However, as the year progressed, and the Mid-Atlantic Commission came no closer to receiving Congressional approval, the Commission in its interim role as sole interjurisdictional Air Pollution Control agency for the metropolitan area, felt that it must continue to maintain its operations at a meaningful level until finally relieved of these responsibilities. As this is written, the situation has still not been resolved and it is still possible that the Commission will assume some of the functions which were to be assigned to the Mid-Atlantic States Commission. Connecticut is considering joining the present air pollution program of the Commission.

Unless and until its present functions are transferred to another agency the Commission will continue

its short range air pollution control activities on an on-going basis. These activities consist of investigating air pollution complaints, participating in the Regional Air Pollution Warning System and furnishing data from our air sampling stations to appropriate control agencies.

II. WATER POLLUTION

New York

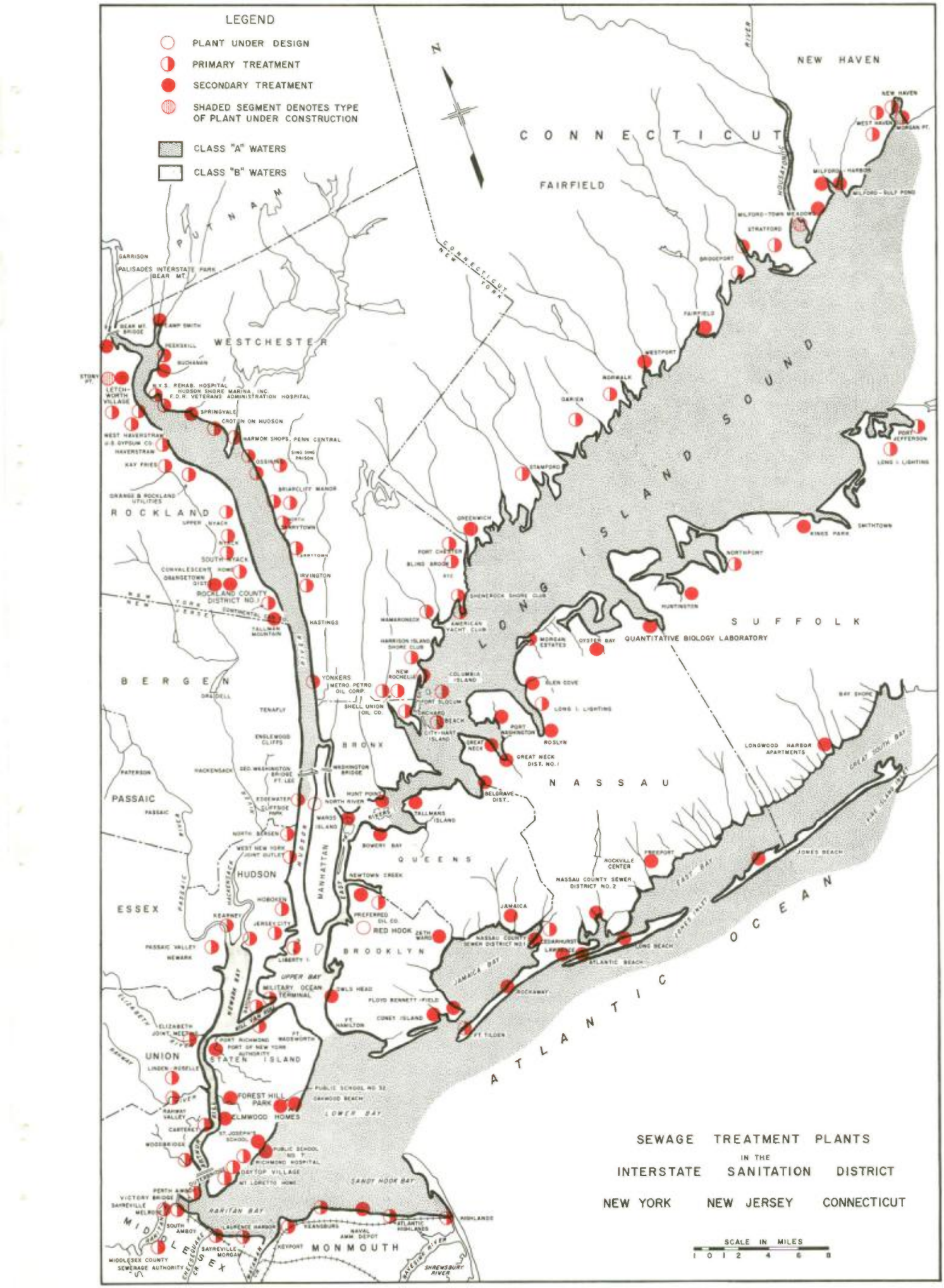
New Jersey & Connecticut

GENERAL

There were 83 water pollution control projects which were completed, under construction or being planned during 1968. An estimated total of more than $945,756,453 has been designated to be spent on this work. A breakdown of this figure gives $27,632,753 for 24 completed projects, $77,618,700 for 19 projects under construction and $840,505,000 for 40 future projects. This spending will improve the quality of effluents discharging to District Waters through the construction of new treatment plants, pump stations, force mains and sewers; upgrading of existing plants; and the planning and engineering of projects to be constructed in the future.

The status of construction, degree of completion, costs and details concerning plant design given in this Annual Report are in all cases that reported to the Commission by responsible officials in the respective state or local governmental agencies, sewage authorities or consulting engineering firms.

A map of the Interstate Sanitation District on the following page indicates the type of treatment provided by and the approximate location of each plant within the District. Appendix A lists additional information on each plant.


LEGEND
PLANT UNDER DESIGN
PRIMARY TREATMENT
SECONDARY TREATMENT
SHADED SEGMENT DENOTES TYPE OF PLANT UNDER CONSTRUCTION
CLASS "A" WATERS
CLASS "B" WATERS
CONNECTICUT
NEW HAVEN
FAIRFIELD
WESTCHESTER
PUTNAM
ROCKLAND
BERGEN
PASSAIC
ESSEX
HUDSON
UNION
MIDDLESEX
MONMOUTH
OCEAN
BRONX
MANHATTAN
BROOKLYN
QUEENS
NASSAU
SUFFOLK
LONG ISLAND SOUND
ATLANTIC OCEAN
QUANTITATIVE BIOLOGY LABORATORY
SEWAGE TREATMENT PLANTS
IN THE
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 2 4 6 8

COMPLETED PROJECTS

Bear Mountain, N.Y.

New secondary treatment facilities have been added to the existing primary plant which consists of one Imhoff tank, a chlorine contact tank, open sludge drying beds, and a control building. The new units were completed in Spring 1968 and include two high rate trickling filters, one final clarifier, Barminutor, flow meter and two new 200 pounds per day chlorinators.

Cost of the new construction was $103,672 for the 250,000 gallons per day plant.

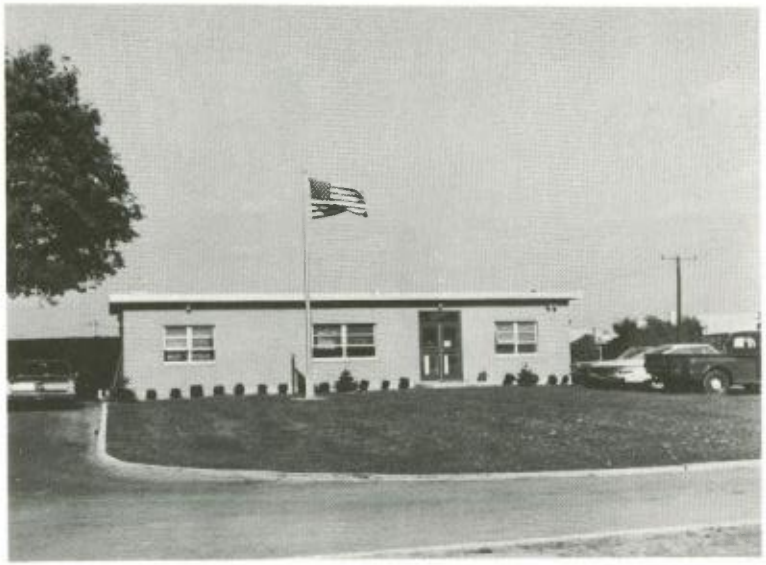
Buchanan, N.Y.

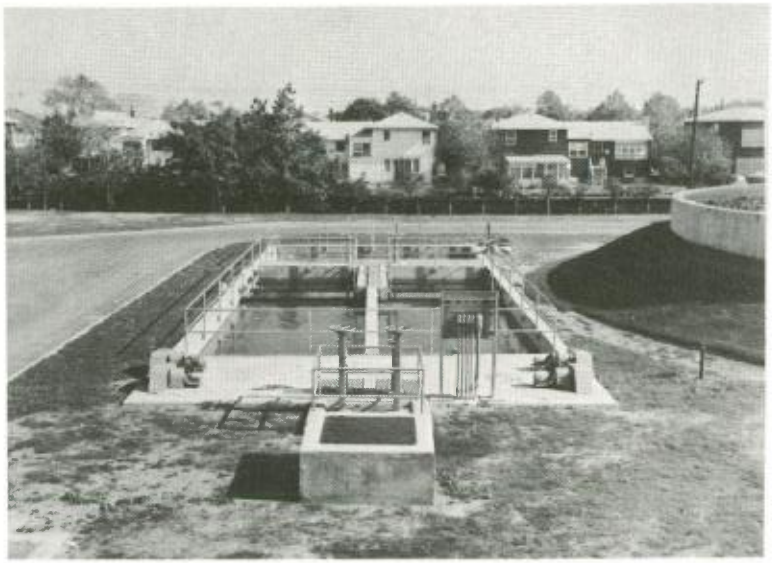
The Village of Buchanan required all property owners to connect their waste discharges to the Village sewer system by the end of 1968.

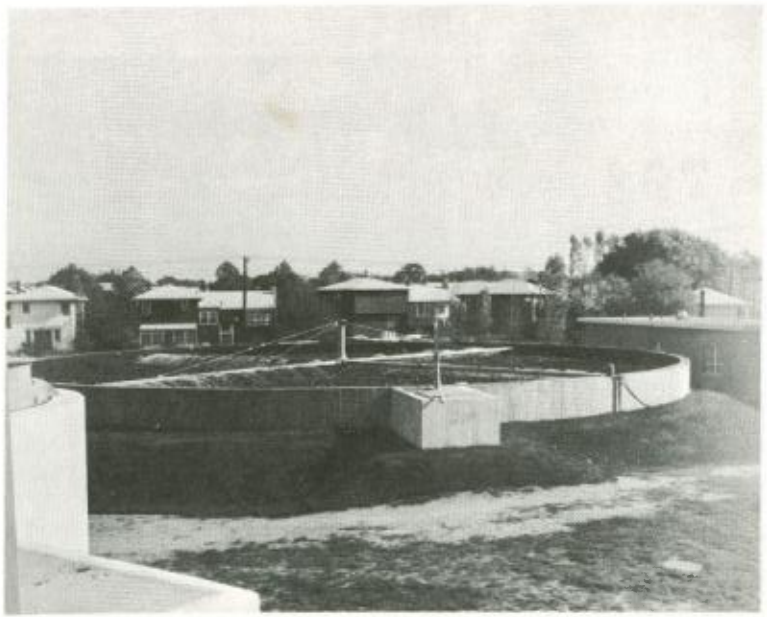
Cedarhurst, N.Y.

Construction of the expansion and conversion of the Cedarhurst Primary Treatment Plant to a secondary treatment plant was completed in 1968. This project consisted of rebuilding two circular clarifiers and the addition of the following equipment: a high rate trickling filter, 80 ft. x 5 ft., and two secondary settling tanks, each with a capacity of 5,280 cubic feet. An 8,850 cubic foot secondary digester and associated pumps will also be installed. Under this contract, the two existing digesters will be converted so that one digester will be used as a sludge storage tank and the other as a primary digester. New chlorination equipment will be installed and modernization of a pumping station with two 350-gallon per minute pumps is also included. The design capacity for the Cedarhurst Secondary Treatment Plant will remain at 1.0 million gallons per day. The cost of this construction and rebuilding is $900,000.

The Cedarhurst plant is now in full operation as a secondary treatment plant. The pumping station has







CEDARHURST
SEWAGE TREATMENT PLANT

JOJI TAKAGI
CONSULTING ENGINEER

also been modernized and is now in operation.

East Street, New Haven, Conn.

Several new additions to this plant were completed during 1968. These are new primary settling tanks, sludge concentration and storage tanks and a multiple hearth incinerator.

Elizabeth, N.J.

To eliminate the discharge of raw industrial wastes to the Arthur Kill from the lower Trumbull Street Sewer and Bayway sections of Elizabeth, a $1,030,000 bond issue ordinance was introduced on April 11, 1967. Construction of the Bayway Interceptor Sewer and East Side Industrial Waste Sewer which is located on right-of-way within the property of Singer Manufacturing Company was completed in 1968.

The Bayway Sewer construction includes 3,420 feet of 30-inch sewer, 1,360 feet of 24-inch sewer and 3,390 feet of 8-inch to 15-inch sewer. The East Side Industrial Sewer includes 2,930 feet of 18-inch pipe.

New sewers, a pumping station and force main will eliminate pollution from the Port of Elizabeth area. The project includes 7,500 feet of sewer pipe and over 2,000 feet of CIP pressure main. The construction cost was approximately $950,000.

Elmwood Homes, Staten Island, N.Y.

An activated sludge plant has been completed at this site at a cost of $400,000 in order to treat wastes from 48 duplex homes. The following units are to be included in this project: bar screen, comminutor, two 230,000 gallon aeration tanks, two settling tanks, chlorine contact tank, sludge holding tank, two blowers, standby diesel engine, HTH storage tank, and pump station.

Fairfield, Conn.

Enlargement of this activated sludge plant was completed in 1968 at an approximate cost of $700,000. The new units added were a primary settling tank, two final settling tanks and the reconditioning of two digesters.

The capacity of the aeration system will be increased by the addition of more tanks and blower equipment.

The plant's increased capacity will be 6.0 million gallons per day at a cost of $1,600,000. Expansion of the service area calls for a pumping station and force main to serve a 400-bed hospital located on the East Turnpike and the Stratfield area of town.

Forest Park, Staten Island, N.Y.

Secondary facilities have been constructed to accommodate 1200 new two-family homes. New facilities at this site are four 250,000 gallon aeration tanks, two settling tanks and a sludge holding tank. Operation began in 1968 and should give a 90 per cent biochemical oxygen demand reduction and 90 per cent total suspended solids reduction.

Greenwich, Conn.

A pumping station, force mains and trunk sewers to take sewage from the Riverside Area of Greenwich to the Grass Island Treatment Plant is completed. The project's cost was about $3,200,000.

Jersey City Sewerage Authority, N.J.

A new chlorination system has been installed at both the East Side and the West Side plants. These installations include piping and automatic residual chlorine analyzers complete with the latest leak detecting equipment. The chlorinators are of the manual automatic solution feed type with a 400 to 8,000 pound per day capacity.

An intercommunication system between both plants and

the outlying service areas is now in operation.

Tanks have been installed to supply water to serve the plant water system at both of the sewage treatment plants. The West Side Plant has a new 30,000 gallon pedisphere and the East Side Plant a new 5,000 gallon water tank.

Total cost of the work completed by Jersey City in 1968 is approximately $300,000.

Long Beach, N.Y.

Modernization of the Long Beach Secondary Treatment Plant has been completed. Modification of the present grit collecting system and repairs to the wet well have been done. New chlorination equipment has been installed to replace the older existing equipment. Two comminutors and an additional sewage pump have also been provided for under this contract.

Cost for the modernization of the Long Beach Treatment Plant was about $213,000.

Middlesex County Sewerage Authority, N.J.

Construction of the Edison Pump Station in the Raritan Centre Site (Old Raritan Arsenal) has been completed. This was built as a replacement for the Hayden Pumping Station, which has a 6 million gallon per day capacity. The new station has a 67 million gallon per day capacity and ultimately, with additional pumps, this will be increased to 115 million gallons per day. A new force main across the river from this station to the central treatment plant and the new gravity sewer to the new station have been installed for the ultimate capacity.

New York City, N.Y.

Hunts Point, New York

The new Ely Avenue Pumping Station has been completed at a cost of $402,000. It will add 1.6 million gallons per day to the Hunts Point Treatment

Plant.

Jamaica, New York

Improvements to aeration tanks have been completed and a new sludge line installed at a cost of $1,200,000.

Newtown Creek, New York

A sludge vessel with a 100,000 cubic foot capacity is completed and operational. The cost was $3,900,000.

Facilities for hypochlorination of Newtown Creek's effluent have also been completed.

North River, New York

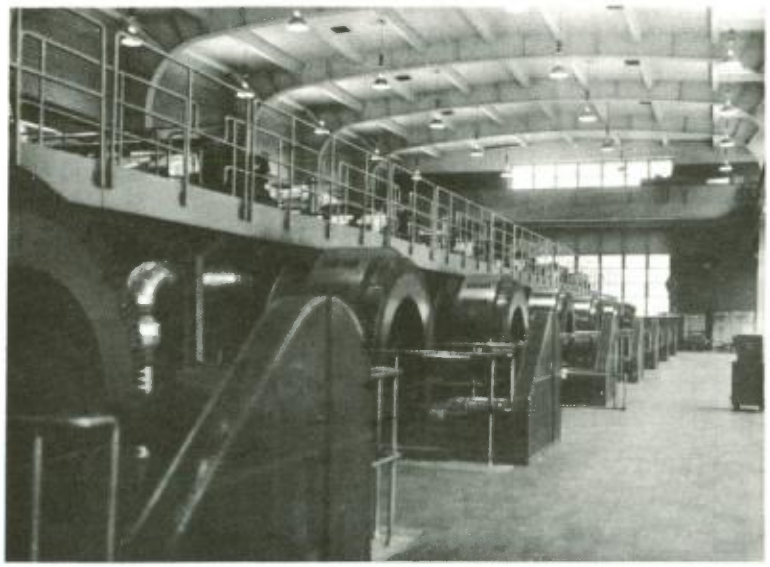
Contract 4 which is the construction of an interceptor from the Harlem River to Broadway was completed in 1968 at a cost of $3,000,000.

Owls Head, New York

Conversion of a sludge digestion tank to a materials handling building has been accomplished. This will enhance the maintenance program for the entire Division of Plant Operations by serving as a centralized materials storage and distribution warehouse.

Wards Island, New York

Three pumping stations, force mains and intercepting sewers serving the Riverdale section of the Bronx were completed in 1968 at a total cost of $1,190,000. These have added a flow of 2.88 million gallons per day to the Wards Island plant at the present time and a flow of 10.25 million gallons per day is anticipated by the year 2000.



NEWTOWN CREEK

SEWAGE TREATMENT PLANT

NEW YORK CITY

ENVIROMENTAL PROTECTION ADMINISTRATION

Penn Central Railroad, Harmon Shops, N.Y.

Several new treatment units have been installed at Harmon Shops and the bypass has been sealed off. The new facilities are a lagoon, wet well, and oil belt. These changes should prevent discharges of oil in the effluent.

Norwalk, Conn.

Construction work on the Norwalk Plant was completed recently at a cost of $1,500,000. This first phase of an overall plan to upgrade the plant to provide secondary treatment included 4 new primary settling tanks, a new contact tank, a 36-inch outfall line and an FS unit for burning sludge.

Orangetown District #1

In October 1968, the Orangetown District #1 Treatment Plant stopped treating wastes and began operation as a pump station which will divert the present flow to the Orangetown District #2 Plant. Four pumps will be in service with the following capacities in gallons per minute: 4,900, 2,400, 1,700 and 1,200. The only treatment units which will be in service at the pump station are bar screens and automatic grinders.

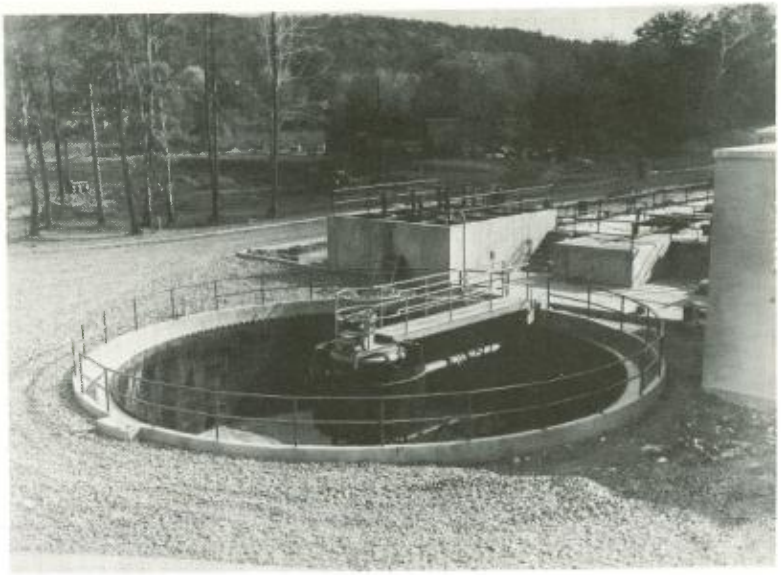
Passaic Valley Sewerage Commission, N.J.

The Passaic Valley Sewerage Treatment Plant has added two sludge storage tanks to its facilities. These have a capacity of 7,000 tons each and were completed at a cost of $1,300,000 in 1968.

Rockland County Sewer District No. 1, N.Y.

In November 1968, construction was completed on a 10-million gallon per day activated sludge treatment plant with the provisions for step aeration at an estimated cost of $4,762,081.

The sewage handling units of the plant in the order of the flow are: pumping station, primary tanks, aeration



ROCKLAND COUNTY SEWERAGE AUTHORITY

SEWAGE TREATMENT PLANT

BOWE, WALSH & ASSOCIATES

CONSULTING ENGINEERS

tanks, final settling tanks and a chlorine contact tank. The sludge handling units are: return sludge pumping chamber, primary sludge pumping chamber, cyclone grit removers, concentration tank, digesters, and sludge oxidation facility. The remaining units include an administration building and a garage.

The County District's responsibility is to build the interceptor sewer, the sewage treatment plant and to maintain them once they are constructed. It is the responsibility of the towns and villages to build and maintain the lateral sewers.

The construction of the county sewer system has been divided into 23 individual contracts. Three pump stations have been completed. These are: Hackensack $391,000, Central Nyack $152,000 and North Rockland $268,000.

Stage II work consists of 16 individual contracts.

The total estimated cost of the entire project is $30,000,000.

Roslyn, N.Y.

Work has been completed on the modernization and repair work of the Roslyn Treatment Plant. This contract includes the rehabilitation of the primary settling tanks; trickling filters; secondary settling tanks; and sludge handling equipment. Additions include a comminutor, new main pump and controls, and heating coils to be installed in the digesters. A new sewage pump was installed to replace an old one which was failing. Cost of this project is approximately $125,000.

Sing Sing Prison, Ossining, N.Y.

Both of the treatment plant's primary tanks have been completely overhauled and a new bar rake has been installed. Provisions have also been made for chemical treatment of raw sewage at the point of discharge of the raw sewage pumps.

PROJECTS UNDER CONSTRUCTION

Croton-on-Hudson, N.Y.

A new Barminutor Model C is to be installed at the Nordica Drive Pump Station for a cost of about $4,700. This work is being done by plant personnel.

East Shore Plant, New Haven, Conn.

The East Shore Plant is being expanded and modernized. The entire job includes the following projects: an additional circular settling tank, a barminutor chamber, a larger Dow flow measuring tube, outfall P/S, sludge thickener tank, new circulating equipment in digesters, a secondary grit removal system and an additional main sewage pump.

This new construction will increase the plant's design flow to 12.5 million gallons per day at a cost of approximately $709,000 and is expected to be completed by spring 1969.

F. D. R. Veterans Administration Hospital, N.Y.

Construction began on August 1, 1968, to upgrade the treatment plant to provide secondary treatment. Completion is expected in the summer of 1969. Several new units being added include a trickling filter, two secondary final settling tanks, two recirculating pumps and a chlorine contact tank. The design flow is 750,000 gallons per day and the cost of the work is $148,000.

Great Neck District, N.Y.

This sewer district will be expanded by the construction of a new pumping station; interceptors and force main to be installed in the "Miracle Mile" area of Manhasset. Construction began in late 1968 and will cost about $395,000.

Great Neck Village, N.Y.

Construction for the expansion and modernization of the Great Neck Village Secondary Treatment Plant started late in 1967 and should be completed early in 1969. In detail, the construction and modifications consist of replacing two existing primary settling tanks with two 50 ft. by 15 ft. enclosed units, a grit chamber and installation of an external heat exchanger and replacement of the furnace for the digesters. This project also includes repairs to the existing trickling filter, changing a chemical storage room to accommodate pre-chlorination equipment and modifications to the chlorine contact tank. The total cost for this 1.5 million gallons per day plant is estimated at $328,000.

Milford, Conn.

Construction of a new activated sludge treatment plant is underway and is expected to be completed by the end of 1969. The plant will have a capacity of 3.2 million gallons per day and will serve the Devon area. The Housatonic River is the new plant's receiving stream.

Nassau County District #3, N.Y.

On November 19, 1968, the plant construction was opened for rebids. At present, the plant site is being hydraulically landfilled.

One interceptor is being installed and is 50 percent completed. The Massapequa Park Collection District was opened for bids in November 1968.

New Rochelle, N.Y.

The New Rochelle County Plant is installing a new emergency generator at an approximate cost of $75,000. Operating power will be derived from city gas.

New York City, N.Y.

Coney Island, New York

Work is in progress to improve the plant's sludge thickeners for $500,000 and the plant's digesters for $4,000,000. The first project is to be completed by the second quarter of 1970 and the latter by the first quarter of 1971.

New York City General Information

Contracts totaling 1.5 to 2.0 million dollars annually for operation and maintenance at all plants throughout the city are continually being processed. This is work of a minor and immediate nature such as replacement of pump parts, lighting, safety rails, painting and other plant improvements.

Newtown Creek, New York

The Manhattan pumping station is under construction with completion scheduled for the last quarter of 1970. This has been designed for a flow of 170 million gallons per day at a cost of $9,600,000.

The Johnson Avenue interceptor in Brooklyn should be in service in the fourth quarter of 1969.

North River, New York

Construction was started on interceptor contract 2B in the second quarter of 1968. This interceptor will run from the plant south to 125th Street. Completion is anticipated in the third quarter of 1970 at a cost of $29,000,000.

Owls Head, New York

Work is in progress to improve the plant's chlorination facilities. This is being done in two phases. The first phase, at a cost of $107,000, consists of new storage tanks and piping to be completed in the second

quarter of 1969.

Phase 2 is the installation of hypochlorination facilities to be in service by the second quarter of 1970. In Phase 2 the chlorine contact time will be increased to 25 minutes by the conversion of an existing aeration tank to a chlorine contact tank.

Spring Creek, New York

The New York City sewer system is of the combined type and as a result, a large amount of raw sewage is discharged to the receiving waters during rain storms. This sewage is especially detrimental in the vicinity of existing or potential bathing beaches where it becomes a public health hazard.

An Auxiliary Program is, now, being accomplished to impound, disinfect, settle and degrit these combined flows in the vicinity of proposed bathing beaches. Construction of the first prototype plant began in the third quarter of 1968 and is located at Spring Creek on Jamaica Bay. This $12,000,000 plant will have a reservoir with an impoundment capacity of 12,400,000 gallons and should be completed by the third quarter of 1970.

After each storm, that water which has been collected in the impoundment reservoir will be pumped to the 26th Ward Plant for full treatment.

In conjunction with this work, a massive study was begun in the second quarter of 1968 at an approximate cost of $1,000,000 to make an evaluation of water quality before and after the Spring Creek Plant starts its operation.

Wards Island, New York

Rehabilitation of the plant's final settling tanks is underway with completion expected by the second quarter of 1969 at a cost of $1,100,000. This work includes new flights and collecting mechanisms.

Port Washington, N.Y.

Construction is now in progress on the new sludge incinerator. The secondary digester will be converted to a useful building and a new sludge thickener tank is now being added. The primary digester will be reconditioned and used as a standby sludge storage tank. Two new pumping stations and main sewers will be built to service a newly developed section of the Port Washington Sewer District. Modernization of the existing main pumping station will also be done. The estimated cost of the new construction and modernization is expected to be about $592,000. Completion is anticipated in May 1969.

Rahway Valley Sewerage Authority, N.J.

Final design of modifications and secondary treatment facilities was completed in 1968.

Modifications of the existing primary system call for a new parallel grit chamber, new mechanical bar screen and expanding the plant's capacity from 65 to 75 million gallons per day by putting larger engines on pumps and converting a 7 million gallon per day pump to a 15 million gallon per day pump. Primary settling tanks will be improved to eliminate carry-over of solids.

Plans call for building a new Administration Building and converting the existing one to a new Laboratory.

A step aeration process is planned to upgrade this plant's treatment. Aeration tanks and diffusers are being designed for a 35 million gallon per day average daily flow. Other equipment to be included in the secondary treatment process is as follows:

5 Diesel Engines and Blowers
4 23 million gallon per day Low Lift Pumps
3 60 Ft. Sludge Thickeners
3 80 Ft. Digesters
3 120 Ft. Final Settling Tanks

The existing digesters are to be converted to

sludge storage tanks. The cost will be about $10,800,000.

Bids for the first phase of construction have been accepted. Work in this phase includes: rehabilitation of settling tanks, a new grit chamber, installation of four sewage pumps, building for burning grease, installation of a centrifugal pump and a new electric panel.

The bids for construction of secondary treatment facilities are to be let during the first phase of construction.

Stony Point District #1, N.Y.

This present high rate secondary treatment plant that services part of Stony Point will be abandoned and the raw sewage diverted by gravity to the new Stony Point extended aeration plant to be completed in the Spring of 1969. The plant with a capacity of one million gallons per day will be constructed at a cost of $1,000,000.

Contracts #2, #3, and #6 were also completed in conjunction with the new treatment plant at an estimated cost of $1,760,000. These are respectively an intercepting sewer, lateral sewers and an effluent outfall pipe.

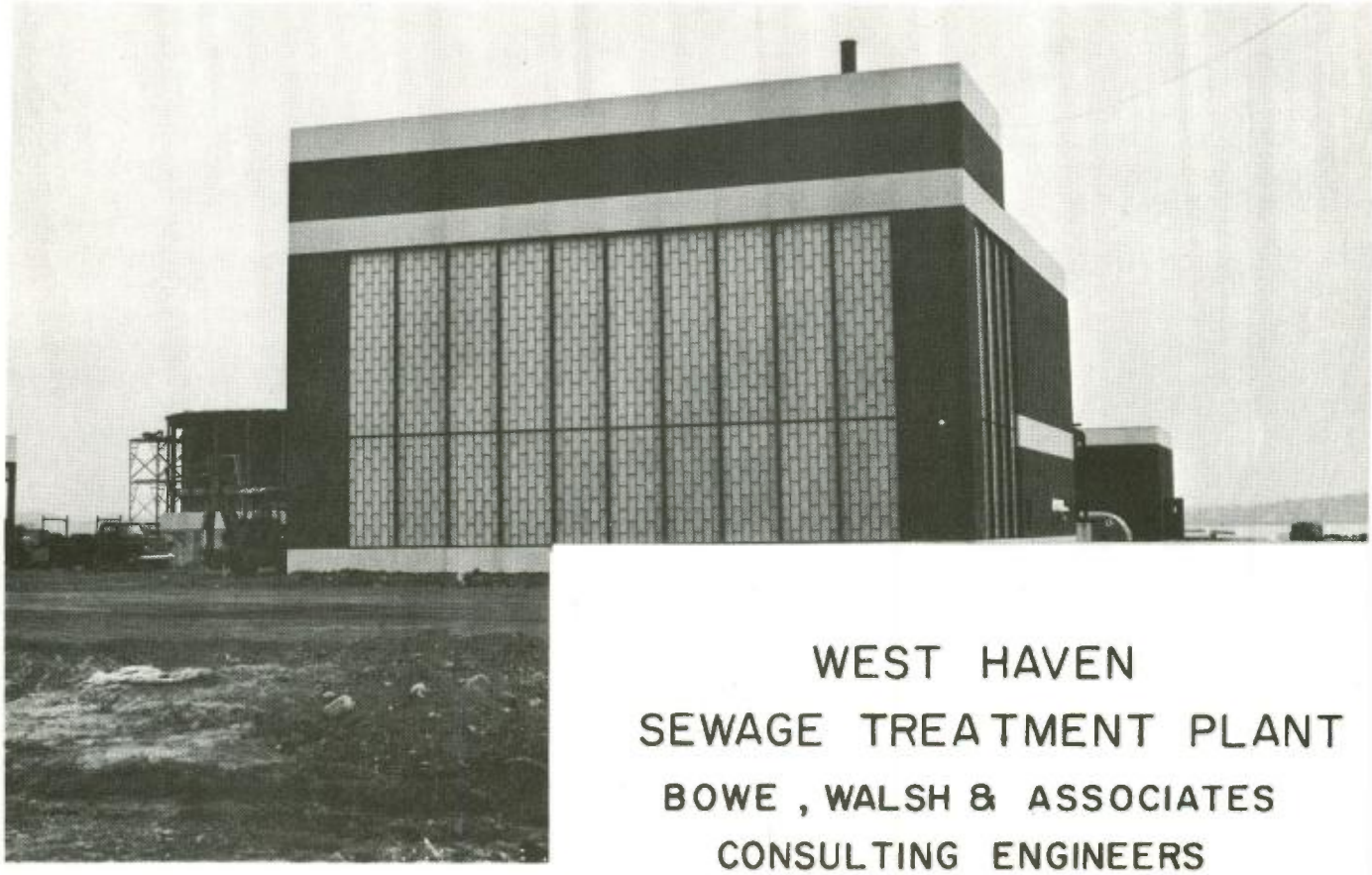
Tallman Mountain State Park, N.Y.

This is a new extended aeration plant with a design flow of 20,000 gallons per day. It will be in service in the summer of 1969 at a cost of about $40,000.

West Haven, Conn.

On January 1, 1969 the new treatment plant, located on Beach Street, will begin operation. At the same time, construction will begin on installing the units necessary for secondary treatment.

The new plant's design capacity is 23 million gallons per day. To date, more than three million dollars have been spent on this work which includes five new pumping stations and the modernization of the ones in existence.



WEST HAVEN
SEWAGE TREATMENT PLANT

BOWE, WALSH & ASSOCIATES
CONSULTING ENGINEERS

FUTURE PROJECTS

Belgrave Sewer District, N.Y.

An engineering report has been made for the purpose of constructing a new 40 foot diameter primary digester and a grit washer and building. Purchase of a tank truck to transport sludge to the Nassau County District Number 2 Treatment Plant is also under consideration.

This construction and purchase is not expected to take place before 1970. The total cost is presently estimated at $400,000.

Bridgeport, East Side, Conn.

An engineering study is being made for conversion of the East Side plant to secondary treatment.

Bridgeport, West Side, Conn.

An engineering study is also being conducted here to convert this primary plant to a secondary treatment plant.

Darien, Conn.

A study is being made to determine the feasibility of pumping all sewage to Stamford.

Estates of Great Neck Landing, Babylon, N.Y.

Plans have been approved by the New York State Health Department for the construction of a tertiary treatment plant of a private development of 230 homes on the South Shore of Suffolk County. These plans which are now awaiting action by the Suffolk County Health Department call for extended aeration followed by sand filters.

The treatment plant will be constructed along the East Side of Dolphin Drive and will have a design flow of 125,000 gallons per day. Its effluent will empty into the Great Neck Creek. Cost of the plant, sewers and pumps will be approximately $300,000.

Fort Tilden, N.Y.

Plans have been approved to take this plant out of service and to divert its flow to the Rockaway Treatment Plant. Start of construction is pending on federal funding for the project.

Freeport, N.Y.

Final design of the expansion and improvements required in the Freeport Secondary Treatment Plant for the control of industrial wastes has been completed and is awaiting state and federal approval prior to acceptance of bids.

The design capacity of the Freeport Plant will be increased from 4.0 to 6.0 million gallons per day and the Ray Street pumping station is being modernized. New facilities to be constructed at the treatment plant are an enlarged chlorine building to handle one ton cylinders, new settling tanks, a high rate filter and a grit chamber. Cost of this new work is estimated at $765,000.

Glen Cove, N.Y.

A report for conversion of the Morgan Island Treatment Plant to a pumping station has been completed. This report has been approved for both state and federal financing. Itemized costs are as follows: conversion to a pumping station ($36,000), force mains and interceptor ($337,000), and the main lift station ($120,000).

Work should begin early in 1969.

Greenwich, Conn.

Plans have been received by the Connecticut State Department of Health for construction of the Bell Haven Pumping Station, force mains and trunk sewers to convey septic tank discharge to the Grass Island Treatment Plant.

Huntington, N.Y.

Plans for new construction have been revised and resubmitted for approval. They are presently being reviewed for approval for a federal grant.

Included in this project are installation of a standby generator, revision of the present grit collecting chamber and a new vacuum filter. Total cost for this work is estimated at $160,000.

Jersey City Sewerage Authority, N.J.

Studies are underway by consultants to determine the feasibility of converting both the East Side and West Side Plants to provide secondary treatment.

Joint Regional Sewerage Board, N.Y.

The final legal steps have been made to form a joint sewer district. This district will include the Village of West Haverstraw, the Town of Haverstraw Sewer District No. 1 and two New York State institutions, Letchworth Village and the Rehabilitation Hospital and also the industry of the Garnerville Holding Corporation. The Town of Haverstraw Sewer District will be responsible for the construction of the sewers in its jurisdiction at an estimated cost of $800,000.

The Joint Regional Sewerage Board will construct a new 3.2 million gallon per day modified activated sludge treatment plant at an estimated cost of $1,800,000. Upon completion of this new facility, the primary treatment plants of West Haverstraw, Letchworth Village and the New York State Rehabilitation Hospital plant will be abandoned and the raw sewage diverted to the new plant.

Plans for this work have been approved by the New York State Department of Health and forwarded to the Federal Government for review and approval.

Laurence Harbor, N.J.

The preliminary engineering reports for secondary treatment are complete and the final plans are completed and have been submitted to the State Health Department for approval. The capacity of the plant will remain at 1.4 million gallons per day, and the treatment will be upgraded to mechanical contact aeration giving a 90 percent biochemical oxygen demand reduction and a 90 (or greater) percent total suspended solids reduction. Secondary units to be installed are dual aeration tanks with 1-1/2 hours detention time and dual secondary settling tanks with 3 hours detention. The cost of these secondary units is estimated at $750,000. The starting date for construction depends on when Federal funds become available.

Linden-Roselle Sewerage Authority, N.J.

Design of secondary treatment facilities has been completed. Four additional acres will be added to the treatment plant property to provide room for the expansion.

Biological treatment will be provided by a deep plastic media roughing filter to be followed by a step aeration activated sludge process. The first stage will have a 17 million gallon per day capacity and the ultimate capacity will be 25.5 million gallons per day.

Thickening tanks are to be provided for sludge concentration, together with additional sludge storage facilities. The plant will continue to handle Rahway Valley Sludge and to barge sludge to sea.

Provisions are being made for effluent chlorination. The existing pump station will have its capacity increased to 51 million gallons per day, which is that of the incoming trunk sewer. Plans call for conversion of sedimentation tanks to final clarifiers.

Long Beach, N.Y.

A permanent dock to accommodate a sludge barge has been designed and bids are being taken for its construction.

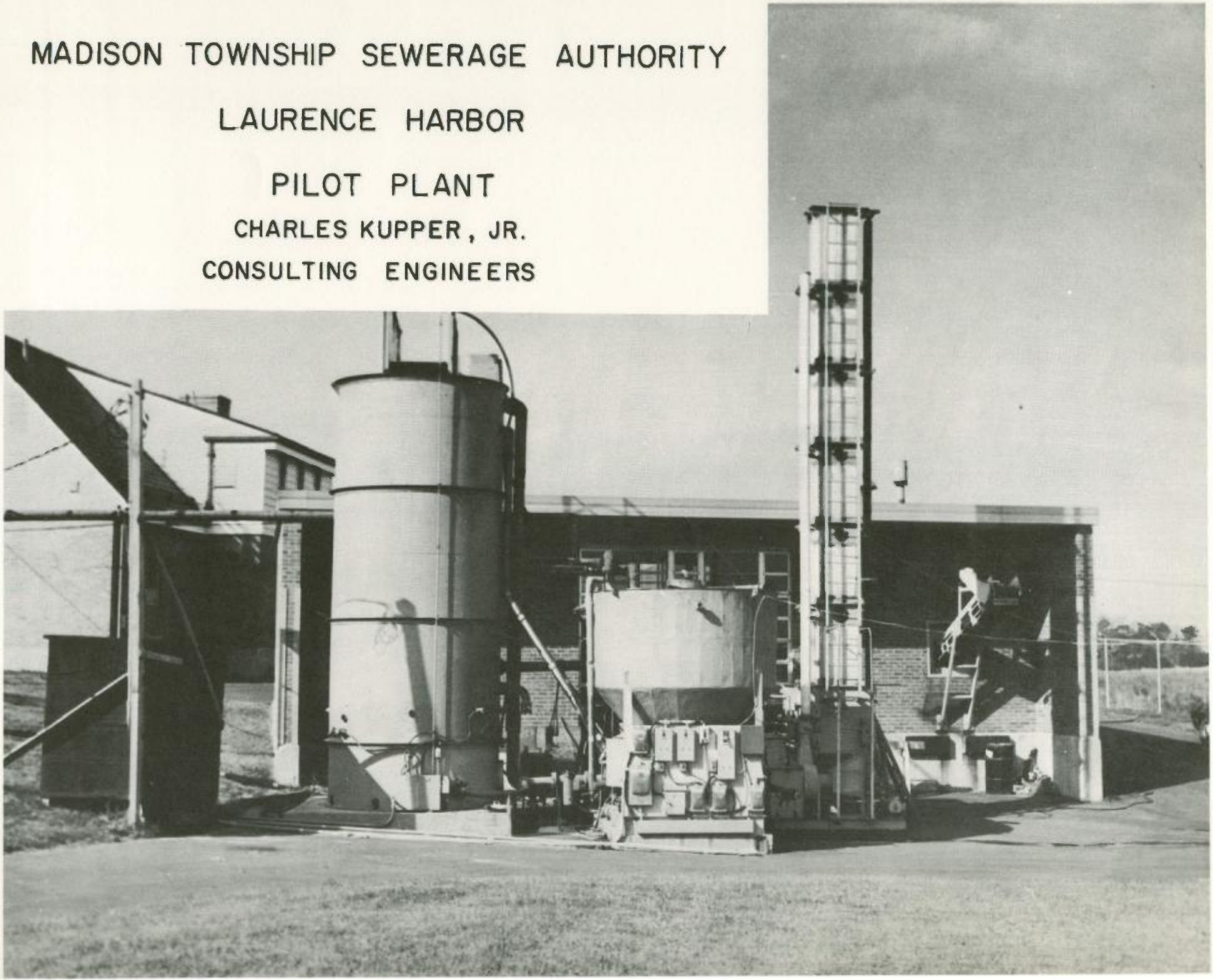
MADISON TOWNSHIP SEWERAGE AUTHORITY

LAURENCE HARBOR

PILOT PLANT

CHARLES KUPPER, JR.

CONSULTING ENGINEERS



Nassau County District Nos. 1,2,3,4, N.Y.

Abatement work to be done in three collection districts of Nassau County is presently undergoing review by the Board of Supervisors. Last year the cost of the job was estimated at $335,000,000; however, this figure will be revised upward.

Nassau County District No. 4, N.Y.

A consulting engineering firm has completed its report to Nassau County concerning their comprehensive study of a sewer district to serve the entire length of the North Shore of Nassau County. The report considers the sewerage facilities needed in this area of the county. It is now being studied by the New York State Department of Health.

New York City, N.Y.

Bowery Bay, New York

Final design is in the works to improve preliminary and final sedimentation tanks. Construction is scheduled to begin in the third quarter of 1969 and be completed at the end of 1970 for a cost of $1,500,000.

Consultants are working on studies for the expansion and upgrading of the plant.

Work on the Rikers Island pumping station force main and interceptor to convey 1.1 million gallons per day of sewage to the Bowery Bay Plant will begin in the first quarter of 1969 and end at the start of 1970 at a $500,000 cost.

Hunts Point, New York

Expansion and upgrading of the Hunts Point plant is under design. Also being studied is the feasibility of bringing the City-Hart Island flow to this treatment plant.

Construction should begin in 1971 and the plant is expected to be operational by the second quarter of 1973 at a cost of $28,000,000.

Jamaica, New York

A feasibility study is underway by consultants to upgrade units in the plant so as to assure an overall biochemical oxygen demand removal of at least 80 percent by the step aeration process. Total cost should be about $14,500,000.

North River, New York

This plant, which will be located between 137th Street and West 145th Street on the North River, is being designed to handle 220 million gallons per day of raw wastes which are now entering the Hudson and Harlem Rivers from upper Manhattan. North River will be a step aeration treatment plant, designed for a 90 percent biochemical oxygen demand removal.

The North River Sewage Treatment Plant is scheduled to be completed and operational by the first quarter of 1975 at a cost of about $140,000,000. The work will be accomplished in two phases. First is the laying of foundations to be started by the end of 1969 and second is the remainder of the work which is scheduled to begin by the third quarter of 1971.

Also, in the design stage are three interceptors and a sludge vessel with a 100,000 cubic foot capacity. The interceptors are expected to be completed in the third quarter of 1972 at a cost of $76,000,000.

Oakwood Beach, New York

This plant will also be upgraded to a step aeration plant with its capacity doubled to 40 million gallons per day and ultimately to 80 million gallons per day. About $27,800,000 will be spent on this project. Design is now underway with construction completion anticipated by the final quarter of 1975. Outfall design is

treatment plants. The entire flow of raw sewage from these three communities will be diverted to the new Orangetown Secondary Treatment Plant by the construction of the necessary pumping stations to lift the raw sewage from the river level up to the old Erie Railroad right-of-way. From this point, it will flow by gravity to the Orangetown-Sparkill Pumping Station.

To take the flow from the Jewish Convalescent Home and from the Village of Grandview, a new pump station will be constructed. The flow from this station will be pumped to Nyack's gravity sewer line and then to the Sparkill Pumping Station.

Orangetown Sewer District No. 2

Raw sewage from Rockland State Hospital will be diverted into Orangetown District No. 2 by late summer 1969.

Oyster Bay, N.Y.

The Oyster Bay Sewer District has obtained title to the property on which a pumping station is to be built. Construction should begin in early 1969 at an approximate cost of $42,000.

Passaic Valley Sewerage Commission, N.J.

The Sewerage Commission is conducting an engineering study for the purpose of adding a grit chamber and incinerator unit to the present plant. This study is scheduled for completion by January 1969.

Port Jefferson, N.Y.

Design of a new secondary treatment plant is in progress. It is estimated that the new plant will have a design flow of approximately 4 million gallons per day and should be started about 1970.

Plans to expand the Sewer District have been approved by New York State and bids are now being taken for construction. This work will consist of a pumping station and four

and one-half miles of sewers.

South Amboy and Sayreville, N.J.

The towns of South Amboy and Sayreville are presently considering diverting the flows from their respective treatment plants to the Middlesex County Sewerage Authority Plant in order to meet New Jersey State standards for secondary treatment.

Suffolk County Districts Nos. 4,5,6,7,8, N.Y.

A study has been conducted by an engineering firm concerning the requirements for collection and treatment of sewage along the North Shore of Suffolk County.

This study indicates that Districts 4,5, and 6 will be combined to serve Huntington and the communities surrounding it. District 7 will treat the sanitary wastes of the Smithtown section and District 8 will accept the wastes from the adjacent drainage area of Port Jefferson. In each instance, activated sludge treatment will be employed.

Westchester County, Department of Public Works, N.Y.

Westchester County has divided its territory into three study areas in an effort to determine the most feasible way of dealing with the collection and treatment of sewage and industrial wastes on a county-wide basis and to conform with New York State water quality standards.

These reports have been completed by three consulting engineering firms using a design period of fifty years. The recommendations made are now being considered at an estimated total cost of $112 million.

The proposals made by the Westchester County Comprehensive Sewerage Study provide for secondary treatment of all waste waters in the County. Primary facilities at Yonkers, New Rochelle and Blind Brook will be upgraded to provide secondary treatment. Secondary plants at Buchanan, Peekskill, Lakeside Village and Yorktown Heights should be

expanded to handle larger flows. Secondary treatment plants should be constructed now or when needed at Ossining, Springvale-on-Hudson, Katonah-Bedford Hills, Kisco River, Peach Lake, Lake Waccabuc, Cross River, Lake Kitchawan, the Byram River, Banksville, Bedford Village, Scotts Corners and Vista. The recommendations of this study also provides for expansion and construction of sewers, force mains and pump stations where needed.

The Westchester Board of Supervisors has unanimously approved (in October 1968) to allocate $2,450,000 to make initial plans and studies to upgrade the sewage treatment plants at Yonkers, New Rochelle and Rye. This program's total cost is estimated at $54,120,000.

Westport, Conn.

This sewage system will be expanded through the construction of laterals, possible force mains and pumping stations. Facilities at this activated sludge plant will be increased to accommodate the higher flow.

Woodbridge, N.J.

Final plans have been completed and submitted to the New Jersey State Health Department for approval. The plans submitted call for combining Carteret with Woodbridge. The Keasby Sewage Treatment Plant will be converted to a pump station and its flow will pass through a force main to the Woodbridge Plant.

The new plant will handle a flow of 15.5 million gallons per day and is expected to give an 85 percent biochemical oxygen demand reduction and a 90 percent total suspended solids removal. The two existing primary clarifiers are to be converted to secondary clarifiers and a third clarifier is to be constructed. A new chlorine contact tank and a new aeration basin are also to be added. The existing sand filters will be rehabilitated to provide tertiary treatment for that portion of the flow which is to be sold to industry for cooling purposes. Alterations, new secondary units and the force main will be completed at an estimated cost of $6,000,000.

INDUSTRIES IN THE INTERSTATE SANITATION DISTRICT

A major portion of the remaining sources of untreated wastes which flow to Interstate Sanitation District Waters originate from industrial sources. To date, these sources of industrial pollution in the District have not been thoroughly investigated as is the case throughout most of the United States. To establish an effective program for control of industrial waste discharges, it is necessary to have available accurate and up-to-date information on all industries located on District Waters.

The Interstate Sanitation District is presently conducting an Industrial Waste Survey to obtain needed information on all industries within its jurisdiction. Most of the data is being obtained through visits with company officials by a Commission representative. Industries have generally been quite cooperative and this has proved to be a successful method of obtaining data. State and local health departments have also been helpful in providing information on industries within their respective boundaries.

The material being sought falls into the following categories:

1. General Site Plan which shows all discharge points.

2. Plant Statistics including amounts of raw materials and finished products.

3. Plant Processes.

4. Existing Waste Treatment Facilities.

5. Present Status of Enforcement Proceedings.

During 1968, the Commission concentrated on industries located in Rockland and Westchester Counties. In 1969, Nassau and Suffolk Counties and the portion of the District located in New Jersey will be covered.

Alcolac Chemical Corporation, Ossining, N.Y.

This plant develops new products for the company's main branch in Baltimore. The monomers and surface active agents produced here are of a wide variety and production is constantly changing as new product ideas originate from the laboratory.

Water used here is purchased from the Village of Ossining at a rate of approximately 3000 gallons per day and is used primarily for cooling. The company estimates about one per cent for process and one per cent for sanitary.

Sanitary wastes discharge to the village sewer. The rest of the flow is discharged to the Hudson River with a 10 degree centigrade temperature rise and may contain small amounts of organic or inorganic soluble salts.

American Cyanamid Co., Linden, N.J.

Three waste storage tanks with a 135,000-gallon capacity each are now in operation at American Cyanamid. A 5,000 ton barge hauls 1,200 to 1,400 tons of waste per trip 120 miles to sea for disposal every 7 to 10 days.

A sampling investigation of the plant's five outfalls was made by the New Jersey State Department of Health and the Interstate Sanitation Commission on September 13, 1968. Analysis of the samples showed the release of wastes which were acid, toxic and contained some organic matter.

Anaconda Wire and Cable Company
Hastings - on - Hudson, N.Y.

Anaconda manufactures hot rolled copper rods, cold drawn bare copper wire, bare copper strand and paper lead power cable. Water is used at the plant mainly as rinse water, for quenching, makeup water in the cooling system, sanitary and drinking. There are four sources of water: 1) New Rochelle Water Company, 2) Brook Water, 3) Deep Well Water for cooling, 4) Hudson River Water. Total

water consumption is about 1.16 million gallons per day according to estimates made by the company in June 1968. Sixteen cooling towers are utilized for conservation of the water supply. About one million gallons per day are lost through evaporation.

Sanitary wastes are connected to the city sewer. The rinse water discharged to the river contains copper. Anaconda is installing a continuous ion exchange system for removal of the copper ions.

Borne Chemical Company, Elizabeth, N.J.

Lubrication oils, sole leather, tanning products, textile processing oils, fugitive tints for yarn and fuel oil additive are produced at this plant.

Over 15,000 gallons per day of city water is purchased from Elizabeth. Water is either consumed in production or discharged to the city sewer as wastewater.

There are now no storm or waste water discharges from this plant site to the Arthur Kill. The dibenzol, disulfide process has been discontinued and the large open holding tank which took the waste from this process and overflowed onto the plant property will be taken out of service and removed.

Chesebrough-Ponds, Inc., Perth Amboy, N.J.

Petroleum jelly and white oil are produced at this plant. Raw materials used are petroleum, oils, waxes, sulphuric acid, soda ash and caustic soda.

About 33,000 gallons of fresh water are utilized daily for cooling, steam, sanitary and fume scrubbers.

An inspection of the plant was made by the Commission in August 1968. This revealed that all the contaminated effluent is now being discharged to the city sewer including neutralized fume scrubber effluent. Steam condensate, cooling water and storm water are the only waste waters flowing to the Kill through the plant's

oil separator.

Chevrolet - Fischer Body Divisions
General Motors Corporation, North Tarrytown, N.Y.

Both of these General Motors Divisions are located on a site extending into the Hudson River near the Tappan Zee Bridge. Automobile and truck parts are assembled at North Tarrytown. Plating, stamping, marking and other manufacturing operations are not done at this plant site.

All waters utilized at GM are purchased from the municipal supply. Processes which result in the discharge of wastes are washing of metal parts in caustic baths to remove oil and other contaminants, rinsing these washed parts and cleaning up of the painting booths by water sprays. Analysis of the effluent to the Hudson River showed a flow of about 0.7 million gallons per day which had a high concentration of B.O.D., suspended solids and total chromium. Sanitary wastes discharge to the village sewer. A consultant was hired by the company to study various alternatives of disposing of General Motor's industrial wastes. The September 1968 report recommends diversion of the plant wastes to the Westchester County sewerage system.

Consolidated Edison Company of New York Inc.
Indian Point, Buchanan, N.Y.

This is the only atomic power generating station in the New York area. The Indian Point reactor went into operation on August 2, 1962. The #1 unit now running with a capacity of 280,000 kilowatts produces approximately 1,124,000 megawatt-hours of electricity per year and utilizes both fuel oil and nuclear fuel. A #2 unit now under construction will have a 1,000,000 kilowatt capacity and will utilize only nuclear fuel.

Water used at the Indian Point Plant is supplied by the Village of Buchanan and the Hudson River. About 400 million gallons per day is drawn from the Hudson River for cooling, utilized on a once through basis and returned to the river with a maximum temperature rise of 13

degrees Fahrenheit. Tests by Consolidated Edison indicated that this return water contains less than 0.1 parts per million of boric acid, trisodium phosphate, detergent, sodium hydroxide, sulfuric acid and solium hypochlorite.

Sanitary and radioactive wastes amounting to 4,500 gallons per day and 74,000 gallons per day respectively are treated at the plant. Sanitary wastes are treated by a comminutor, septic tanks and filters and then disposed of by percolation into the ground.

A radioactive waste disposal system monitors and collects all liquid, solid and gaseous wastes from the nuclear plant processes. These liquid wastes are stored in holdup tanks and if necessary, can be treated for the removal of radioactive elements before they are discharged into the Hudson. Disposal of all radioactive wastes is controlled by the Atomic Energy Commission.

Continental Can Company, Piermont, N.Y.

This plant utilizes waste paper and wood pulp to manufacture combination paperboard for use in packaging. The one cylinder machine at the plant manufactures about 175 tons of paperboard which is formed into folding cartons.

White water wastes from the plant are presently treated by a 64-foot diameter Dorr Clarifier. Plans for upgrading treatment have been approved by the State of New York, Department of Health. The new facilities will provide for chemical coagulation and aeration of the company's white water wastes.

New treatment facilities are to include two 6.25 million gallon aeration basins and four sludge lagoons.

Regular sampling of Continental Can's effluent is done by the Interstate Sanitation Commission.

The Ednalite Corporation, Peekskill, New York

Machining of metal parts and grinding and polishing of lenses are the main operations conducted at the Peek-

skill plant.

Scrap metal from the machinery is collected in barrels and the oil is permitted to drain off to a pan where it is collected for reuse.

About 400 gallons per day of wash water is used in the grinding and polishing process. This flow passes through a sedimentation container prior to being discharged to the Hudson River. This water contains inorganic solids.

A consultant is working on plans for treatment which will consist of sedimentation and filtration prior to discharge to the City of Peekskill sewer system. All other waste flows are already connected to the municipal system.

Edo Corporation, Iona Island, N.Y.

Edo Corporation maintains a barge on the Hudson River which is used as a lab to conduct experiments for the U.S. Navy.

They use about 190,000 gallons per day for cooling from the Hudson River on a once-through basis and about 300 gallons of river water per day which flows through the sanitary system untreated. About 10 men are employed on each of the two daily shifts.

General American Transportation Company, Carteret, N.J.

This site is a storage and distribution facility for a variety of liquid chemicals, naphthas, petroleum products and plastic pellets. These materials are transported by ship, barge, truck and tank cars.

About 100,000 gallons per day of fresh water are utilized during the winter and 60,000 gallons per day the remainder of the year. Sixty percent of this water goes toward steam production and the remainder is for cleanup, washdown and sanitary purposes.

Oil water separators receive storm runoff from the diked storage area along with cleanup water. Inspection of this site during the summer of 1968 revealed that two pumps have been installed to divert this flow to the city sewer system. All other waste water flows are also connected to the municipal system.

General Aniline and Film Corporation,
Linden, N.J.

This plant site formerly occupied by Nopco Chemical Corp. was sold to Allied Chemical Company and is now being taken over by General Aniline and Film Corporation. The grounds are being cleared with the exception of three buildings to be left standing. These will house the Environmental Engineering Department of G.A.F. Corp. Two buildings are to be used for office purposes and the third as a laboratory.

About 55 employees will work at this site. Wastes will be handled by package type aeration units attached to each of the buildings.

General Mills Inc., Chemical Division
Ossining, New York

This General Mills plant is located on property leased from Mobil Oil Corp. and lies on Sing Sing Kill, a tidal tributory of the Hudson River. Only two products are produced at the Ossining Plant, Natural Vitamin A and Natural Vitamin E.

Water used at General Mills is purchased from the Town of Ossining and also pumped from three wells on the plant property.

Cooling water which amounts to about 25,000 gallons per day is discharged to Sing Sing Kill via an 8 inch pipe. Contaminated process effluent and sanitary wastes flow to the city sewer system. A considerable portion of wastes from the Vitamin E process are saved and shipped to another site out of state for recovery.

Hudson River National Defense Reserve Fleet,
Tompkins Cove, N.Y.

The Maritime Administration maintains a fleet of about 184 ships in the Hudson River Reserve Fleet to be available for emergency use. Maintenance work includes: turning over machinery periodically, spraying internal surfaces with a preservative oil, cleaning and coating all electrical equipment with a fungus retarding varnish, waterblasting loose scale and rust off decks, hulls and superstructures and spraying periodically the entire outside of the ship with a gray tinted preservative oil.

Eighty-six persons are employed by the fleet. Sanitary facilities which utilize river water are located on the headquarters barge, two tugs and a derrick barge. Groco Model CL-100 chlorinator- macerator units have been purchased and are being installed on all of the fleet's sanitary facilities.

International Flavors and Fragrances, Inc.
Union Beach, N.J.

This plant is located on the south shore of Raritan Bay and manufactures intermediate essence and essential oils. Over 400 separate chemicals are utilized in the production of more than 300 different products. About 350 persons are employed during the 24 hour production day.

The water source is three wells on the plant property from which water is drawn at a rate of about 200 gallons per minute. This is utilized for sanitary, cooling, boilers and production.

Sanitary wastes are disposed of by septic tanks and tile fields. Production wastes are treated by a clarifier, neutralization system and 25 percent of the total flow is then aerated.

A visit was made to the plant site on October 16, 1968 by representatives of the New Jersey State Department of Health and the Interstate Sanitation Commissions. An inspection of the plant site showed that the effluent

after treatment is discharged to the ground on the plant property and reappears on the surface at the Raritan Bay shoreline prior to flowing to the bay. Grab samples were taken at both points and also at the storm water outfall which was the only other discharge visible at the time of the inspection.

The flow to the bay had visible oil. Analysis of the sample of the discharge which was entering the Bay showed an acid pH, a biochemical oxygen demand of several thousand parts per million and a zinc concentration of 8 parts per million.

Kay-Fries Chemicals, Inc., West Haverstraw, N.Y.

Kay-Fries produces organic intermediates for a variety of uses such as medicinals, adhesives, photography, insect repellants and dyestuffs. Production at this plant varies with demand and includes cyanocetic acid, malonates, orthoesters, malonaldehyde acetals, chloracetates and phthalate esters. New products are also developed and tested at this location.

Cooling water is pumped from Cedar Pond Brook at a rate of about 1.5 million gallons per day, utilized on a once-through basis and discharged to Minesceongo Creek. During its passage through the plant, this water picks up acid from the barometric condensers and some turbidity caused by insoluble salts.

The present waste treatment system neutralizes the waste to a pH near 7.0. This system consists of a primary and secondary neutralization tank and storage tanks for lime slurry and caustic soda.

This treatment facility is being upgraded for solids removal by the addition of a wet well, a 45-foot diameter Dorr-Oliver circular clarifier and a sludge settling tank. Plans for this have been submitted to the New York State Department of Health for approval.

Koppers Wood Preserving Division, Carteret, N.J.

This Port Reading operation uses creosote and No. 6 fuel oil to preserve pilings, telephone poles, railroad ties and other wood products. The wood is dried, treated with preservative and stored for shipment.

Fresh water is used at the rate of 1,000 to 1,500 gallons per day for the recirculating cooling water system, cooling the air compressor and sanitary. Sanitary wastes are handled by a septic tank.

Inspection of this plant site on July 26, 1968 confirmed the fact that all of this plant's process wastes have been diverted to the city sewer. The only flow which continues to be discharged to the Kill is overflow from the cooling pond. Sampling showed this water to be clear and uncontaminated.

National Lead Company, Perth Amboy, N.J.

This plant manufactures Dutch Boy Paints and also recovers lead from storage batteries which is cast into shapes for shipment.

About 0.5 million gallons per day of fresh water are used. Approximately 75 percent of this is cooling water and the remainder is for sanitary purposes and product consumption. Waste waters are collected in a tank from where they are pumped to the municipal sewer system. During storm conditions, a by-pass permits excess flow to go to the Kill.

The pollution problem of acid discharge from the battery crushing area has been solved by the installation of a neutralization system. A brief description of this system: acid and wash water are collected in a sump in the battery crushing area and pumped to a tank for settling. The flow then goes to a second tank of the same size and finally to a steel tank with a turbine agitator where anhydrous ammonia is added for neutralization. An 8,000 gallon steel tank has been installed for storage of the neutralizer. The effluent from the neutralization system

discharges to the city sewer.

A grab sample was taken of the creek below the battery crushing area by the Commission on July 30, 1968. The pH was found to be neutral.

New York City Department of Sanitation, Staten Island, New York

The New York City Department of Sanitation maintains two land fill operations on Fresh Kills Creek. Garbage and trash are barged to this location, unloaded by crane and trucked to nearby locations for disposal.

Unfortunately a considerable amount of this material destined to be used as land fill finds its way to Fresh Kills Creek and from there to the Arthur Kill. Most of this pollution occurs while the barges are being unloaded. Some pollution occurs when the waste material is picked up from the uncovered barges by winds and carried to the waterways.

An observation of the Fresh Kills Creek vicinity showed the shore line and surface of the creek to be very heavily littered by plastic bags, plastic containers, papers, wood, tires etc. This same type of material was seen along the Arthur Kill's shoreline at General American Transportation Corporation in Carteret, N.J.

This trash has interfered with the operation of power plants on both the New Jersey and New York shorelines of the Arthur Kill. One plant complained that it had to shut down its generators in the middle of the week to clean condenser tubes which had become clogged with plastic material.

The situation was brought to the attention of New York City Department of Sanitation by the Commission. A letter of August 2, 1968 from the Department of Sanitation to the Interstate Sanitation Commission indicates that an engineering study of the problem has taken place. As a result of this report, supervisors at the plants have been instructed to improve housekeeping and conduct a cleaner

LEFT: Fresh Kills, Staten Island with New York City, Department of Sanitation barge unloading operation in the background.

RIGHT: Shoreline of Fresh Kills, Staten Island, New York.

LEFT: Fence along the Arthur Kill shoreline at Carteret, New Jersey with plastic bags and other debris deposited on it during high tide.

RIGHT: Shore of the Arthur Kill at Carteret, New Jersey with a heavy accumulation of plastic containers, wood, paper and other trash deposited by the tide.

unloading operation. Also, four foot high barriers are to be constructed in the vicinity of the 10 yard bucket swing to prevent the excess debris from falling into the creek. Completion is expected in the summer of 1969 at Plant #1 and in the summer of 1970 at Plant #2.

Oil Terminal Survey of the Interstate Sanitation District

The Interstate Sanitation Commission is conducting a survey of all oil terminal facilities located on District Waters. This work is a part of the Commission's Industrial Waste Survey.

During 1968, oil terminals in Rockland and Westchester Counties were investigated. Each terminal was visited by a Commission representative who met with company officials, made an inspection of the terminal site and requested that an information form be filled out for reference. The information obtained fell into the following categories: (1) general operational information; (2) water usage; (3) sanitary wastes; (4) storm water; (5) equipment washup; (6) oil separators; (7) boilers; (8) tank cleaning; (9) transfer operations; (10) accidental losses; (11) plot plan of plant property.

Oil Terminals Surveyed During 1968

Rockland County

1. Gurran Oil Company, Stony Point
2. Haverstraw Petroleum, Haverstraw

Westchester County-Hudson River Drainage Basin

1. American Oil Company, Verplanck
2. Besson Oil Company, Inc., Dobbs Ferry
3. Esso Standard Oil Company, Peekskill
4. Gulf Oil Company, Yonkers
5. Maue Oil Company, Inc., Ossining
6. Mobil Oil Company, Inc., Ossining
7. Peekskill Fuel Co., Peekskill
8. E. Robison, Inc., Hastings
9. Sinclair Refining Company, Verplanck

10. Tappan Tanker Terminal, Hastings
11. Tarricone Oil Terminal, Yonkers

Westchester County-Long Island Sound Drainage Basin

1. B&P Solvents, Mount Vernon
2. Cities Service Oil Co., Mount Vernon
3. Crown Central Petroleum Corp., Mount Vernon
4. Humble Oil & Refining Co., Pelham Manor
5. Metropolitan Petroleum Corp., Mount Vernon
6. Mobil Oil Company, Inc., Mount Vernon
7. Pelham Oil Company, Pelham Manor
8. Power Oil Corporation, Mount Vernon
9. Power Petroleum Corporation, Port Chester
10. Royal Petroleum Corporation, Mount Vernon
11. Sentinel Oil Company, Inc., New Rochelle
12. Shell Oil Company, Mount Vernon
13. Suburban Fuel Oil Company, Mount Vernon
14. Sun Oil Company, Pelham Manor

Orange and Rockland Utilities, Inc., Tompkins Cove, N.Y.

This is an electric power generating station with a present capacity of 305 megawatts from its four existing units. With the completion of Unit #5, now under construction, the output capacity will be raised to 503.5 megawatts. About half the energy utilized in power generation is derived from coal and half from natural gas depending upon the availability of gas.

Water for the Lovett Plant is derived from two sources: the Hudson River and the municipal supply. River water is utilized for cooling, ash sluicing and the plant's fire system. City water is supplied to the boilers and to the sanitary system.

Sanitary wastes are given secondary treatment and chlorination at the plant prior to discharge to the Hudson River. Sluice water passes through a settling pond prior to being returned to the river.

Pharma Chemical Company, Division of Verona-Pharma Chemical Corporation, Bayonne, N.J.

This plant manufactures a wide variety of organic dyes. Most of the 600,000 to 700,000 gallons per day of fresh water intake is discharged to the Kill Van Kull after being used in production. This waste is neutralized to within the pH limits of 6.5 and 8.5 prior to discharge.

Sampling investigations were conducted by the Interstate Sanitation Commission on August 30, 1968 and on September 3, 1968. A combined investigation with the New Jersey State Department of Health was made on October 1, 1968. Field observations and analysis of samples showed these wastes to be highly colored, foam producing and high in BOD, COD, settleable solids and heavy metals.

Letters were sent to the company by the Commission and the New Jersey State Health Department requesting that a time schedule be submitted within 90 days by Pharma Chemical Corporation to take corrective measures to make their discharge acceptable.

Phelps Dodge Copper Products Corporation, Elizabeth, N.J.

Phelps Dodge utilizes copper bars which are brought in by barge to produce such marketable forms of copper as rods, wire, tubes and pipes. The main processes at this plant are hot rolling, billet casting, wire drawing, extrusion milling, tinning, stranding, cold rolling and tube and shape drawing. Over one million pounds of various copper shapes are produced here daily.

Fresh water is used here at an average rate of 416,000 gallons per day and salt water, which is used for cooling on a once-through basis, is drawn at a rate of 1.3 million gallons per day. City water is consumed in pickling and rinsing, sanitary, boilers and for makeup.

Several improvements have been made recently by Phelps Dodge to eliminate pollution of the Kill. New sanitary facilities have been constructed. These are all

connected to the city sewer. Old facilities which used to discharge directly to the Arthur Kill have been removed.

All flows from the west side of South Front Street and the wash water from the pickling area now also go to the city sewer. The only flows which should continue to be discharged to the Kill are salt water from the closed cooling system, several floor drains and storm runoff.

Sampling by the Commission in the vicinity of one of the Phelps Dodge outfalls showed a concentration of copper of about eight parts per million. The sampling was done by an automatic sampler over a 24 hour period beginning on the morning of September 11, 1968.

Phelps Dodge Copper Products Corporation, Yonkers, N.Y.

This Phelps Dodge plant manufactures principally underground distribution cable which is now being used more and more by utilities. Production includes paper-insulated and plastic-insulated power cables and high frequency coaxial cables.

The City of Yonkers is the sole source of water supply to Phelps Dodge. This intake of 10.0 million gallons per month is utilized mainly for cooling, makeup for the steam boiler plant and sanitary. Sanitary wastes discharge to the city sewer system and the 9.8 million gallons cooling and makeup water flows to the Hudson River. Cooling towers are utilized to conserve the water required by Phelps Dodge.

Polychrome Corporation, Yonkers, N.Y.

Polychrome manufactures and packages mimeograph stencils, presensitized offset plates and graphic art supplies.

A visit was made to the plant site on July 9, 1968 by a Commission representative. It was learned from company officials that the section of the plant adjacent to the Hudson River is used for packaging and has no process waste being discharged. In the manufacturing area, solvent wastes are collected in barrels and trucked away.

There are no floor drains.

The officials stated that all waste and storm water discharges are connected to the city sewer and that none flow from the plant to the Hudson River.

Preliminary Industrial Survey

This portion of the Industrial Survey is being conducted in order to obtain a complete listing of industries within the Interstate Sanitation District. The preliminary survey will greatly facilitate planning of visits and sampling to be made in a complete survey.

Commission representatives have been making visits to portions of the Interstate Sanitation District and contacting company officials to find out names of personnel responsible for waste disposal, major products and types of discharges to District Waters.

During 1968, preliminary survey work was conducted in several New Jersey counties. These are Bergen, Hudson, Essex and Union Counties.

Reichhold Chemicals, Inc., Elizabeth, N.J.

Synthetic resins, plasticizer, maleic anhydride and phthalic anhydride are manufactured by Reichhold. All of the water utilized by the plant is taken from the City of Elizabeth.

This site was inspected by the Commission on July 30, 1968. The visit showed that flows from the process areas and sanitary facilities are all connected to the city sewer. Storm runoff discharges to a creek adjacent to the plant property which flows to the Arthur Kill.

Rock Industries, Haverstraw and Tompkins Cove, N.Y.

Both of these plants which are owned by the Martin Marietta Corporation do quarrying and rock crushing at their sites on the Hudson River. The Haverstraw plant produces about 7,000 tons of crushed stone per day and the Tompkins Cove plant puts out about 5,000 tons of

crushed stone per day.

Each of these operations utilizes about 1.2 million gallons per day of Hudson River water for crushed stone washing. This water is heavily ladened with settleable solids when it leaves the washing towers and is pumped to the settling ponds. Two new lagoons presently being constructed at each of the plants will provide for 99% plus removal of solids.

United States Gypsum Company, Stony Point, N.Y.

This plant is a nearly completely automated gypsum wallboard mill. Wallboard is manufactured, papered and cut to customer's specifications and then shipped to construction sites.

The plant's two gypsum board mills produced 200 million square feet of wallboard during 1967. Process water is drawn from Cedar Pond Brook at a rate of 36.6 billion gallons per year. It is entirely consumed in production or lost through evaporation.

About 6,000 gallons per day of sanitary wastes are treated by the plant's Imhoff tank and the effluent is then discharged to Minesceongo Creek. This facility is sampled regularly by the Interstate Sanitation Commission. Upon completion of a new treatment plant by Stony Point, the Imhoff tank will be taken out of service and a connection made to the Stony Point sewer system.

Ward Pavements, Inc., Haverstraw, N.Y.

This is a completely automated asphalt plant located on property leased from Rock Industries. Most of the asphalt mixed here is tested by the state highway department and then used in highway repair and construction work.

The plant produces 125,000 tons of bituminous concrete annually during its operating season of April 15 through December 22.

Crushed stone is dried in a rotary kiln prior to being

mixed in asphalt. Air which is drawn from the kilns is heavily ladened with dust and is passed through a primary and secondary dust collection system. The secondary system is a centrifugal spray tower and utilizes water at a rate of 150 gallons per minute when operating. This effluent is then discharged to the Rock Industries settling pond for treatment.

LEGAL ACTIVITIES

Aside from the normal furnishing of advice to the Commission -- an activity which continued at its usual pace during 1968 but which does not lend itself to detailed reporting -- the main occupations of Counsel were in two fields: (1) Post litigation negotiations, and (2) Legislation needed in connection with Commission programs. Each of these items is summarized briefly in this report.

Post Litigation Negotiations

It will be recalled that in 1966, the Commission's enforcement suit against the Village of Port Chester had a successful outcome. The Supreme Court for Westchester County upheld the Commission's contention that the primary treatment plant built by the Village during an earlier phase of the litigation was not sufficient to meet required water quality standards, and that the construction of additional or modified facilities would be necessary. Port Chester was given two years in which to do this work. Late in 1967 it became apparent that the Village would not meet the Court's deadline of May 1968. Accordingly, Counsel at that time informed the Village that the immediate commencement of contempt proceedings by the Commission seemed inevitable.

In order to forestall judicial proceedings, the Village and the Commission were able to arrive at an agreement which in effect constitutes a confession of contempt, if the Village fails to meet any of the dates embodied in the performance schedule. To date, it can be reported that the Village of Port Chester has met the first of these dates. By resolution of the Village Board of Trustees, an election to deliver its wastes to the Westchester County system for treatment and disposal was made. The agreement which is set forth in full in the resolution of the Village Board is reproduced below.

AGREEMENT BETWEEN THE VILLAGE OF PORT CHESTER AND INTERSTATE SANITATION COMMISSION AND FINDINGS OF COURT IN REFERENCE TO CONSTRUCTION OF WASTE DISPOSAL FACILITIES

We, the undersigned do hereby agree for ourselves and on behalf of the Village of Port Chester and the Interstate Sanitation Commission that the Village of Port Chester and its responsible officials have not taken action necessary to secure appropriate disposal of sewage and other wastes by May 26, 1968 as required by the order of the Supreme Court of the State of New York in and for Westchester County contained in the decision of that Court in INTERSTATE SANITATION COMMISSION v. THE VILLAGE OF PORT CHESTER, (Index No. 3598-1962).

While this failure is a violation of the order of the Court and of the clearly established legal obligations of the Village of Port Chester and its several officials, it is recognized that the principal public interest is in the securing of abatement of unlawful waste discharges into the waters of the Interstate Sanitation District and that it would now be a physical impossibility to construct and place in operation by May 26, 1968, the facilities required to accomplish such a result.

It is agreed, and the Court by appropriate subscription hereto finds that failure of the Village of Port Chester and its Mayor, Board of Trustees, Superintendent of Public Works and other responsible officials to comply with each and every provision of the timetable set forth below will constitute contempt of the Supreme Court of the State of New York and will be punishable summarily either as a civil contempt or a criminal contempt, as in the circumstances may be best calculated to secure immediate compliance.

Timetable for Compliance

By October 1, 1968 the Village of Port Chester will, by appropriate resolution of its Board of Trustees, make a binding determination as to whether it will solve its waste disposal problem by conveying said wastes to treatment facilities of the County of Westchester at Blind Brook, and constructing the necessary facilities therefor, or by constructing its own Secondary Treatment Plant and necessary appurtenances.

If the Village determines to convey its wastes to Blind Brook:

1. By June 1, 1969 the final design engineering report shall be submitted by the Village to the New York State Health Department for approval.

2. By January 1, 1970 detailed plans and specifications shall be submitted by the Village to the New York State Health Department for approval. If approval of the final design engineering report is not received by December 1, 1969, the January 1, 1970 date contained herein shall be extended by the number of days beyond December 1, 1969 that it takes for the approval, and each subsequent date on this timetable shall be extended by a like number of days.

3. By July 1, 1970 the Village shall commence construction of the necessary facilities. If approval of the detailed plans and specifications is not received by April 1, 1970, the July 1, 1970 date contained herein shall be extended by the number of days beyond April 1, 1970 that it takes for the approval, and the subsequent date on this timetable shall be a like number of days.

4. By July 1, 1971 the Village shall complete construction and place the facilities in operation.

If the Village determines to construct a Secondary Treatment Plant and necessary appurtenances:

1. By July 1, 1969 the final design engineering report shall be submitted by the Village to the New York State Health Department for approval.

2. By January 1, 1970 detailed plans and specifications shall be submitted by the Village to the New York State Health Department for approval. If approval of the final design engineering report is not received by December 1, 1969, the January 1, 1970 date contained herein shall be extended by the number of days beyond December 1, 1969 that it takes for the approval, and each subsequent date on this timetable shall be extended by a like number of days.

3. By August 1, 1970 the Village shall commence construction of the necessary facilities. If approval of the detailed plans and specifications is not received by May 1, 1970, the August 1, 1970 date contained herein shall be extended by the number of days beyond May 1, 1970 that it takes for the approval and the subsequent date of this timetable shall be extended for a like number of days.

4. By December 1, 1971 the Village shall complete construction and place the facilities in operation.

VILLAGE OF PORT CHESTER

By: John L. Messina, Mayor

INTERSTATE SANITATION COMMISSION

By: Natale Colosi, Chairman

Dated: February 6, 1968
Port Chester, New York

Legislation

In the 1968 session of the New York State Legislature the Commission was interested in the progress of legislation to amend the Tri-State Compact under which it functions. The purpose of the bill was to add to the effluent and receiving waters standards of the Commission by empowering it to make standards by the customary administrative route. The present compact contains detailed standards directly embodied in the text of the law. It is felt that if the Commission could employ administrative procedures for standards-making roughly analogous to those used by the individual states, it would be easier to accomplish the task of harmonizing the standards of the three participating states in the compact area. The legislation passed the New York Senate but was one of the bills not acted upon in the Assembly in that body's last minute rush for adjournment. It is hoped that the legislation can be passed in 1969. Of course, its effectiveness ultimately will depend on similar action being taken in Connecticut and New Jersey. It is hoped that 1969 may see consideration of it in those states as well.

Also, the last few months of 1968 have seen a substantial review of the Commission's air pollution control responsibilities. Starting in the spring of 1967 it seemed likely that a new federal-interstate agency would be established with regulatory powers to deal with interstate air pollution on a five-state basis. However, the Commission continued to maintain its statutory program on behalf of New York and New Jersey, and it seemed best that it should do so until some other arrangements were definitely made.

Events during 1968 appear to make it less likely that any changes along the lines of the projected Mid-Atlantic States Air Pollution Control Compact will be made in the immediately foreseeable future. Consequently, the Commission has once more inquired as to whether Connecticut would be interested in joining the present program. Active consideration of this possibility is now underway.

ORDERS AGAINST MUNICIPALITIES, AUTHORITIES AND INDUSTRIES IN THE INTERSTATE SANITATION DISTRICT

The following lists have been compiled to give easy reference of those polluters which are under State Health Department orders. Time schedules are given, where possible, showing dates for various phases of the pollution abatement program.

CONNECTICUT TREATMENT PLANTS WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
	Fairfield County				
1.	Bridgeport-East Side	2/67	1/69	6/69	1/71
2.	Bridgeport-West Side	2/67	1/69	6/69	6/71
3.	Darien	3/67	2/69	10/69	11/70
4.	Fairfield		1/69	9/69	12/70
5.	Norwalk	7/67	4/69	12/69	1/71
6.	Stamford	6/67	2/69	7/69	11/70
7.	Westport	8/67	10/68	6/69	10/70
	New Haven County				
8.	New Haven Boulevard	9/67	12/69	11/70	11/72
9.	New Haven-East Shore	12/67	12/69	11/70	11/72
10.	West Haven	10/67	12/68	8/69	6/70

NEW JERSEY TREATMENT PLANTS WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
	Hudson County				
11.	Bayonne	10/1/67	3/1/69	6/1/69	10/30/70
12.	Hoboken	10/1/67	3/1/69	6/1/69	10/30/70
13.	Jersey City-East Side	10/1/67	3/1/69	6/1/69	10/30/70
14.	Jersey City-West Side	10/1/67	3/1/69	6/1/69	10/30/70
15.	Joint Outlet(West New York)	10/1/67	3/1/69	6/1/69	10/30/70
16.	Kearny	4/30/68	6/1/69	10/1/69	10/30/70
17.	North Bergen-Woodcliff				12/ 1/66
	Middlesex County				
18.	Laurence Harbor	10/1/67	3/1/69	6/1/69	10/30/70
19.	Middlesex County Sewage Authority	4/30/67	6/30/68	10/30/68	10/30/70
20.	Perth Amboy*	10/1/67	3/1/69	6/1/69	10/30/70
21.	Rahway Valley Sewage Authority	7/31/67	3/31/68	7/31/68	10/30/69
22.	Sayreville-Melrose*	10/1/67	3/1/69	6/1/69	10/30/70
23.	Sayreville-Morgan*	10/1/67	3/1/69	6/1/69	10/30/70
24.	South Amboy*	10/1/67	3/1/69	6/1/69	10/30/70
25.	Woodbridge(Sewarren)*	10/1/67	3/1/69	6/1/69	10/30/70
	Monmouth County				
26.	Atlantic Highlands	10/1/67	3/1/69	6/1/69	10/30/70
27.	Highlands	10/1/67	3/1/69	6/1/69	10/30/70
28.	Keansburg	10/1/67	3/1/69	6/1/69	10/30/70
29.	Keyport	10/1/67	3/1/69	6/1/69	10/30/70

*A contract with the Middlesex County Sewage Authority may be executed in lieu of improving the existing facilities.

NEW JERSEY TREATMENT PLANTS WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
	Union County				
30.	Elizabeth Joint Meeting	6/1/67	3/1/69	6/1/69	10/30/70
31.	Linden-Roselle		4/30/68	7/15/68	12/31/69
	Essex County				
32.	Passaic Valley	10/1/67	3/1/69	6/1/69	10/30/70

NEW YORK TREATMENT PLANTS WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS	START OF CONST.	COMP. OF CONST.
	Rockland County				
33.	West Haverstraw		1/68	5/68	5/69
	Westchester County				
34.	Blind Brook	4/15/69	3/1/70	7/1/70	1/1/72
35.	New Rochelle	4/15/69	3/1/70	7/1/70	1/1/72
36.	Port Chester	4/15/69	3/1/70	7/1/70	1/1/72
37.	Yonkers	4/15/69	3/1/70	7/1/70	1/1/72

CONNECTICUT INDUSTRIES WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS	START OF CONST.	COMP. OF CONST.
	Fairfield County				
1.	Bridgeport Rolling Mills Co.,Stratford	8/31/68	1/31/69	4/30/69	1/31/70
2.	Bullard Co., Fairfield	6/30/68	12/31/68	3/31/69	12/31/69
3.	Carpenter Steel of New England,Bridgeport	12/31/68	4/30/69	7/31/69	4/30/70
4.	Chemical Plating Co., Stratford	8/31/68	1/31/69	4/30/69	1/31/70
5.	Clark Metal Products Inc.,Fairfield	9/30/68	5/31/69	9/30/69	5/31/70
6.	Contract Plating Co., Stratford	8/31/68	1/31/69	4/30/69	1/31/70
7.	Devine Brothers Inc., Norwalk	9/30/68	1/31/69	3/31/69	8/31/69
8.	Electric Storage Battery, Fairfield	6/30/68	2/28/69	5/31/69	4/30/70
9.	Globe Slicing Machine Co.Inc.,Stamford	9/30/68	1/31/69	4/30/69	11/31/69
10.	Handy & Harman, Fairfield		3/31/68	6/30/68	3/31/69
11.	International Harvestor Co.,Bridgeport				12/31/68
12.	C.O.Jelliff Mfg. Co., Fairfield	3/31/68	12/31/68	3/31/69	12/31/69
13.	King Chemical Co., Norwalk		8/31/67	11/30/67	2/29/68
14.	Norwalk Asphalt & Paving Corp.,Norwalk	9/30/68	1/31/69	3/31/69	8/31/69
15.	Raybestos-Manhattan Inc.,Stratford	1/31/69	5/31/69	8/31/69	12/31/69
16.	Ross & Roberts, Inc., Stratford	12/31/68	5/31/69	8/31/69	6/30/70
17.	Rowayton Market, Norwalk				4/30/71
18.	Rowayton Pharmacy, Norwalk				4/30/71
19.	Sikorsky Division,United Aircraft,Stratford				4/30/71
20.	Tilo Company, Inc., Stratford	7/31/68	12/31/68	4/30/69	1/31/70
21.	Wakeman Memorial, Fairfield				10/31/69

CONNECTICUT INDUSTRIES WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
	New Haven County				
22.	C.W. Blakeslee, New Haven	3/31/68	6/30/68	8/31/68	12/31/68
23.	Federal Paper Board Co,Inc.,New Haven	8/31/68	4/30/69	10/31/69	10/31/70
24.	Humble Oil & Refining Co., New Haven	11/31/68	3/31/69	6/30/69	12/31/69
25.	The National Gypsum Co., New Haven	11/31/68	3/31/69	6/30/69	12/31/69
26.	Milford Rivet & Machine Co.,Milford	11/31/67	2/29/68	4/30/68	10/31/68
27.	New Haven Board & Carton Co.,New Haven	7/31/68	12/31/68	3/31/69	3/31/70
28.	New Haven Malleable Iron Co.,New Haven		11/31/68	4/30/69	7/31/69
29.	New Haven Rendering Co.,West Haven				8/31/68
30.	Robert Shaw-Fulton Controls Co.,Milford	5/31/68	10/31/68	1/31/69	12/31/69
31.	Seamless Rubber Co., New Haven	11/31/68	3/31/69	6/30/69	12/31/69
32.	Southern Connecticut Gas, New Haven				11/31/72
33.	United States Steel Corp.,New Haven Works	8/31/68	3/31/69	6/30/69	3/31/70
34.	United Illuminating Co., New Haven				11/31/72
35.	Waterbury Lock & Specialty Co.,Milford	6/30/68	7/31/68	9/30/68	3/31/69

NEW JERSEY INDUSTRIES WITH POLLUTION ABATEMENT ORDERS

	NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
	Middlesex County				
36.	Hess Oil & Chemical Corp.,Port Reading		7/1/67	12/1/67	6/1/68
37.	Philip Carey Mfg. Company,Perth Amboy				1/1/68
	Union County				
38.	American Cyanamid Company, Linden				5/30/68
39.	General Aniline & Film Corp.,Linden	4/30/68	4/30/69	10/30/69	12/30/70
40.	Humble Oil & Refining Company,Linden	9/1/67	6/1/68	7/1/68	12/30/69

NEW YORK INDUSTRIES WITH POLLUTION ABATEMENT ORDERS

NAME	ENGINEER REPORT	PLANS & SPECS.	START OF CONST.	COMP. OF CONST.
Rockland County				
41. Kay-Fries Chemicals, Inc., West Haverstraw*				
42. Continental Can Company, Piermont*				
Westchester County				
43. General Motors-Chevrolet & Fischer, North Tarrytown*				
44. Penn. Central R.R. Co., Harmon*				
45. Refined Syrups & Sugars, Inc., Yonkers*				
46. Standard Brands, Inc., Peekskill*				

*Plant is negotiating to divert its wastes to the municipal sewerage system.

AUTOMATIC WATER QUALITY MONITORING SYSTEMS

GENERAL

The Federal Water Pollution Control Administration, as well as the Interstate Sanitation Commission, presently have Automatic Water Quality Monitoring Systems in the Interstate Sanitation District. The State of New York plans to install eight monitors and a telemetry system within the District. The States of Connecticut and New Jersey have no plans to install their own monitoring systems, but in the future, New Jersey may tie into Federal and Interstate Sanitation Commission systems located in the Interstate Sanitation District. A listing of existing and proposed monitors within the District is shown in the subsequent tabulation.

FEDERAL MONITORS

Federal Water Pollution Control Administration monitors telemeter data to a central receiver in Metuchen, New Jersey. The Federal Monitors measure dissolved oxygen, water temperature, pH, conductivity, oxidation-reduction potential, wind direction, wind speed and solar radiation. Samples are taken at three depths: surface(5 feet below the surface); mid depth; and bottom sample(5 feet above bottom). The F.W.P.C.A. has no present plans for mobile sampling units within the Interstate Sanitation District.

NEW YORK STATE MONITORS

New York State classifies its monitoring stations as Major, Minor and Satellite. Major and Minor Monitors are automatic stations with data transmitted digitally to a central computer. A Major Monitor measures eight or more parameters and a Minor Monitor measures less than eight parameters. A Satellite Station measures less than four parameters with analogue data transmitted to a Major automatic station. The New York State monitors will

measure dissolved chlorides, water temperature, pH, dissolved oxygen, conductivity, solar radiation, stage height, dissolved flourides and air temperature. Data from these monitors will be telemetered to a central receiver in Albany. The station at Bear Mountain Park will be in operation by January, 1969, but all other units are proposed for future installation.

INTERSTATE SANITATION COMMISSION MONITORS

The Interstate Sanitation Commission has two Automatic Water Quality Monitors that continuously telemeter data to a central receiver located in the Commission office in New York City. These monitors sample the water in the East River and the Arthur Kill and are located, respectively, at the Consolidated Edison Generating Stations in Long Island City(Ravenswood Generating Station) and in Staten Island(Arthur Kill Generating Station). The Commission has recently purchased a third monitor which will be used to sample the water in Newark Bay. Present plans call for location of this monitor at Kearny Point in Kearny, New Jersey.

Commission monitors measure dissolved oxygen, water temperature, pH and dissolved chlorides(measured as a function of conductivity). The data that is telemetered to the Commission office is both analogue(in the form of a strip chart) and digital(8 channel paper tape). The digital data is processed by computer and summary reports are prepared on a monthly basis.

TABULATION

OF

AUTOMATIC WATER QUALITY MONITORING STATIONS

IN THE

INTERSTATE SANITATION DISTRICT*

INTERSTATE SANITATION COMMISSION

1. Arthur Kill, Consolidated Edison Generating Station, Staten Island, N.Y. (existing)
2. East River, Consolidated Edison Generating Station, Long Island City, N.Y. (existing)
3. Newark Bay, Kearny, N.J.

FEDERAL

1. Narrows, U.S. Gov't. Quarantine Station, Staten Island, N.Y. (existing)
2. Victory Bridge, Mid-Channel, N.J. (existing)
3. Outerbridge Crossing, East Pier, Staten Island, N.Y. (existing)
4. Kill Van Kull, U.S. Gypsum Co., Staten Island, N.Y. (existing)
5. Throgs Neck (Bridge), Bronx, N.Y.

NEW YORK STATE**

1. Lower Hudson River, Bear Mountain Park (Major)
2. Upper New York Harbor, New York City (Major)
3. Lower Hudson River, Yonkers (Major)
4. Lower New York Harbor, Chelsea (Minor)
5. Lower New York Harbor, New York City (Satellite)
6. East River, New York City (Satellite)
7. East River, New York City (Satellite)
8. Harlem River, New York City (Satellite)

* All stations are proposed, except where indicated.
** Major, Minor and Satellite Stations are indicated.

AUTOMATIC DATA PROCESSING

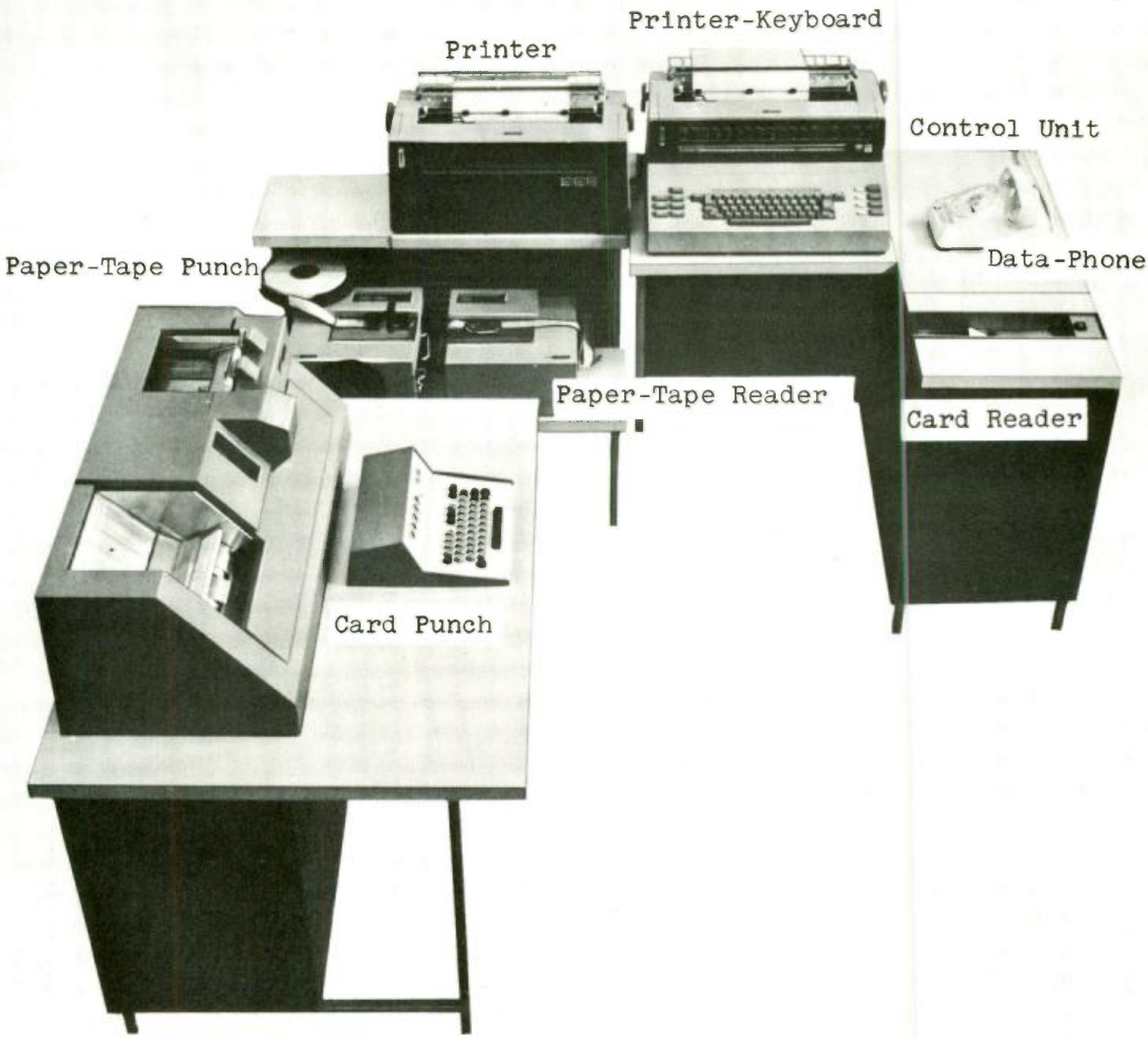
The Commission acquired an IBM QUIKTRAN 2 Time-Sharing Terminal in September 1968. This is an IBM 1050 System comprised of a Control Unit, a Printer-Keyboard, a Paper-Tape Reader, a Paper-Tape Punch, a Card Reader and a Card Punch. This terminal, which is located in the Commission office, is linked to an IBM 7044 Data Processing System located at the IBM Computing Center at 787 U.N. Plaza, New York City via a Data-Phone. The Data-Phone allows communication between the Commission Terminal and the computer over ordinary telephone lines. The terminal has a Home-Loop feature which permits data preparation without hooking into the computer. A picture of the 1050 System is shown on the following page.

Although the Commission ordered the system described above, the September 1968 installation consisted only of the Control Unit, the Printer-Keyboard and the Paper-Tape Punch. The remainder of the equipment is scheduled for delivery approximately January 1969.

Programs are being prepared for the compilation of monthly summary reports for the punched-tape data being generated by the Commission's Automatic Water Quality Monitoring System. The Terminal will also be used for data reduction in Stream Analysis Studies, Industrial Survey Studies, Air Pollution Analysis, Statistical Analysis and any other work which lends itself to computer analysis.

IBM 1050 SYSTEM

QUIKTRAN 2 TIME-SHARING TERMINAL



Photograph courtesy
IBM Corporation

BIOLOGICAL STUDIES

INTRODUCTION

To obtain a well-rounded picture of the degree of water pollution, it is necessary to combine biological considerations with the standard chemical tests. It has been found that generally, a natural body of water has in it a community of organisms with no one particular species in domination. In a body of water which has in some way been effected by mans presence (industrial or domestic), we have observed a decided tendency for such water to show virtually no community structure. Rather we observe a strong domination by one or two groups of species over the other species. An unequal balance of life in a body of water is a clue to probable physiochemical alteration of the environment and is therefore a useful tool in pollutional studies.

WHAT HAS BEEN DONE?

On June 23, 1966, the Commission began work on the quantitative enumeration of the biota from three areas within its District: the Arthur Kill, the Raritan Bay and the Raritan River. The stations were set up at Consolidated Edison, Pennsylvania Coal Dock and at Victory Bridge, respectively. The samples from these stations have been and are presently analyzed on a weekly basis.

Biologically, pollution has been proven at all three of these stations. This is borne out by the fact that two and only two groups of organisms, more specifically two exact species, have been found to exist in numbers far exceeding that which one would assume should be their average presence in a body of water. The two organisms, termed Phytoplankton (free-floating microscopic plants), are called Nannochloris atomus and Skeletonema costatum. The former is a small, spherical, green cell which usually exists as either 2 or 4 celled units. The latter is a filamentous diatom which is usually between 10 and 200 microns long depending upon conditions. Although the diatom is physically a more hearty species than the green algae due to its silicaceous shell, we have found that it

is the little Nannochloris which persists throughout the year. Both of these organisms have been counted weekly and graphed. This year we observed no significant difference in the maximum counts per milliliter for each organism. Why, though, does the smaller, seemingly fragile Nannochloris atomus persist throughout the year?

In 1963 the Commission became interested in its apparent heartiness. It enlisted the services of Haskins Laboratory, specifically, Dr. John McLoughlin, to do a nutritional-physiological study utilizing three stations previously mentioned plus four treatment plant effluent sights: Middlesex County, Rahway Valley, South Amboy and Oakwood Beach Sewerage plants. Twelve areas of study were decided upon concerning the organism: Nitrogen sources, phosphate sources, vitamin requirements, salinity tolerance, pH tolerance, trace element requirements and tolerances, relationship to major ions, chlorophyll and mass culture relationship, light versus temperature with nitrogen and phosphate sources, temperature relations, heterotrophic tendencies and chelation versus trace metals. The following is the report provided by Dr. John McLoughlin of Fordham University in colaboration with Haskins Laboratory. Note that our Nannochloris atomus is being called Didymocystis and should be regarded as the same.

Nutritional-Physiological Studies

1. Nitrogen Sources: The organism Didymocystis can effectively utilize inorganic nitrate and ammonia and organic nitrogen sources, amino acid, proteous peptones, yeast autolyzate and a wide variety of other nitrogen containing organic compounds. The organism responds to a gradient of nitrogen supply from 0.001ppm eliciting growth for about twelve days to a concentration of 100ppm (highest tried). The organism is not sensitive to organic nitrogen over a range of less than 1 to 200ppm. In terms of its nitrogen metabolism this organism shows a typical heterotrophic capability. It can live on inorganic or organic nitrogen supplied in various forms over a wide concentration range.

2. Phosphate sources, types and concentration: This organism responds to inorganic and organic phosphate sources. Its response and tolerance is very wide 0.001ppm 100ppm(highest tried). The utilization of both organic and inorganic sources over a wide tolerance range indicates again the heterotrophy of this organism.

3. Vitamin requirements: Although extensive testings were made, the organism failed to show any absolute vitamin requirement. It was not stimulated by thiamine, biotin or B_{12} - these usually stimulate neritic(offshore) vitamin requirers. The failure to exhibit a vitamin requirement would serve to give this organism a great advantage over other neritic phytoplanktonts which have an absolute requirement or are stimulated by exogenous supplies.

4. Salinity Tolerance: Unlike the typical neritic phytoplankton, this organism can grow extremely well in water which ranges from 0.05 to 4.0% sodium chloride. It has the ability to live for up to ten weeks(longest period tried) in the DV base, a formulated media, which has been diluted to 5% with distilled water. If it is preconditioned to a certain salinity, then transferred into the wide range, all cultures will eventually grow to densities approaching one million cells per milliliter (providing other nutrients are not limiting). Its characteristic response to salinity indicates this organism may exist endemically in "almost" fresh water. It seems reasonable to assume that the cells can live well in a typical eutrophic fresh water biotope. Cells were still visible after having been exposed to 7% sodium chloride indicating it has an osmo-regulatory system which permits wide variation in total ionic concentration. It is a very "rugged" organism. It should be noted that its ability to withstand high concentrations of organic materials (yeast autolyzate, casein hydrolyzate, proteous peptones, etc.) also indicates its definite <u>insensitivity</u> to total dissolved material, either inorganic or organic.

5. pH- The cultures were capable of growing in a range of 5.6 to 8.8. The growth in the acid range was <u>not</u> as good as that near neutrality or slightly alkalinity(7.8). Growth in the acid range was enhanced by organic nutrients

in the form of carbohydrates and hydrolyzed protein and kreb-cycle materials. No studies were conducted to elucidate the acid-growth potential, it was noted and indicates the further heterotrophy of the cultures.

6. Trace element requirements & tolerance: Unlike any other neritic phytoplanktont reported, this culture could withstand and grow extremely well in trace element concentrations ranging fifty-times that found in the basal medium. Addition of additional "non-chelated" elements was not inhibitory at least in concentrations approaching one to one hundred fifty times that found in sea water. If anything, this culture has a tolerance to trace elements which surpasses by a factor of at least six any other neritic organism tested. It responds with increased growth to increases in iron, zinc, cobalt, molybdemum, manganese and vanadium. Its ability to not only tolerate but grow well in the presence of high (0.001-2.0ppm) concentrations of these metals has not been observed with other neritic organisms. It should be noted here that the cultures can also tolerate three to six times the concentration of cyanide, lead, nickel and aluminum which is found in sea-water. As these experiments were conducted with minimal chelation-the tolerance to these ions is remarkable as these concentrations kill off other typical neritic organisms.

7. Relationship to major ions: Because these cells were extremely tolerant to total ions, it was expected that they would grow well in a variety of major ion concentrates. Testing magnesium, cobalt and potassium alone and in various combinations indicated that these cells are extremely tolerant to a wide range of concentrations and combinations ranging from less than 5% sea-water concentration to approximately twice that concentration. The growth in 5% DV was good and the concentration range attained by adding alone or in combination the major ions indicated cultures grew well when the calcium, magnesium and potassium were increased to approximately 50% the value found in sea water but growth at lower ranges was very good. The general indifference to combinations and the wide range tolerance again indicates these cultures can do well in a biotope which ranges from very dilute to

full strength sea water.

8. Chlorophyll and Mass Culture-Light: Mass cultures-5 liter capacity flasks were successfully grown in three light intensities: 200 foot candles, 800 foot candles and 1400 foot candles. Analysis of chlorophyll from these cultures showed that chlorophyll a is the major pigment, more is produced per cell volume in lower light than in the higher light cells from the 1400 foot candles culture apparently had less chlorophyll per cell than those grown at the 200 foot candles intensity.

9. Light vs. temp.- nitrogen sources: In the experiments designed to discern if there was some relationship between light and temperature and the nitrogen and phosphate sources, it was noted that with higher temperatures-(18 - 24 - 28°C) the organic nitrogen and phosphorous containing media supported better growth-approximately two-four times that of the lower temperature range. Inorganic nitrogen and phosphorous were not as valuable as nutrient sources in that the cultures at higher temperatures did not approximate $\frac{1}{2}$ the concentration of cells or demsitometer reading, as the organic and the lower range seemed to show a similar tendency but the difference was not as great. It would appear that the higher the temperature and the higher the light, the cells in organic enrichment will grow very well, while with inorganic nutrients the cultures grew but not nearly as well as the organically enriched.

10. Temp. Relations-Light vs. Dark: Cultures grew in organic medium much better under all circumstances than cultures grown with inorganic nutrients. The dark growth was accomplished in a highly enriched media with temperatures ranging from 18-28°C. We could discern no real difference in light vs. dark growth except that cultures in the light growth grew more quickly, whereas dark grown cultures seem to have a lower growth rate. Eventually these cultures reached densotometric readings comparable to the light grown cultures regardless of temperature.

11. Heterotrophic tendencies: (As has been indicated in items #1, 2, 9 and 10) These cultures exhibited

heterotrophic growth; the addition of light to the heterotrophic growth conditions did enhance the growth rate(cells/milliliter/unit time) were greater. It would appear that these cultures are really extremely well adapted to take maximum advantage of organic and metabolic enrichment- type biotopes-with light adding to their ability to grow to great densities.

12. We were unsuccessful in getting any absolute information on chelation vs trace metals. By indirection it would appear that these cultures can withstand very high concentrations of nonchelated trace elements.

Summation-#1-12.

We can summarize our 1-12 studies in the following observations:

a) These cultures are heterotrophic; they can live and grow in the dark, utilizing organic materials as substrates.

b) They are good photosynthetic organisms, growing well on inorganic nutrients.

c) They are extremely tolerant to changes in total ion concentration,(salinity changes).

d) Their ability to tolerate high concentrations of trace elements is unusual in organisms normally found in the neritic environment.

e) They can use light as an adjuvant to their heterotrophic growth.

f) During heterotrophic light growth, the additional O_2 generated apparently is used to aid the non-photosynthetic metabolisms and thereby permits more rapid turn over of nutrients- both organic and inorganic.

g) These cells are comparatively in-sensitive to a wide range of physical, chemical and nutrient variables.

a) Testing Effluents:

It can be generally stated that the cleared-millipore effluents from the 4 treatment plants when used undiluted were toxic to the test organisms. The cultures of the Didymocystis exhibited the following tendencies:

1. Straight effluents were toxic to cells.

2. Dilutions of effluents with varying concentrations of DV, resulted in growth with most effluents, when the diluent was about 50%.

3. The O_2 production (photosynthesis) of most cultures was either completely inhibited(death of cultures) or very severely limited when effluents were not diluted over a range of 20-80%.

4. Cell sizes were not noticeably influenced by effluents if growth occurred in the diluted media.

5. When the effluents were added to a nutrient depleted DV(minus nitrogen and phosphate sources) they served to supply the nitrogen and phosphorous in quantities greater than 20ppm. This indicated that the cleared effluents contained sufficient nutrients to support the cultures when nitrogen, phosphate and trace elements were lacking. Growth(in the non-toxic dilutions) was in most cases equal to the complete media, but many times surpassed the "conservative base" in that cultures would continue to grow over much larger periods of time-indicating that the effluents contained extremely high concentrations of nutrients. Where effluents killed off the test cultures we were unable to attribute this to any specific cause. In the few cases where all dilutions died, it appeared that some algicidal activity was present in the effluent. In general the effluents when diluted, did supply nutrients to the cultures, which permitted excellent growth. It should be noted that in a few experiments where known organics were added the results did not indicate an additional growth as attributed to the known enrichments; it appeared that the effluents contained enough organic enrichments to support dark growth. The cleared water

samples from the three stations Victory Bridge, Pennsylvania Coal Dock and Consolidated Edison Generating Station indicate that each station can support the growth of the organisms tested. The Con Edison Station seemed to be less detrimental to culture growth. Analysis of these effluents (after cleaning the samples, they were treated as effluents) showed that the nutritive value is much more limited than those of the sewage effluents, in fact these effluents were, with some exceptions, capable of supporting good growth of the test organisms even at concentrations of 80%. They did not reflect the high nitrogen and phosphate found in the four treatment plants but contained nitrogen and phosphate in a range which did support growth, though it varied from less than 0.0. ppm to 5.0 ppm (as tested with known nitrate, phosphate values in enrichment culture tubes). In all cases tested, the presence of some nitrate and phosphate (or equivalent sources) was indicated by growth of the test organism. Analysis of supernatents of mass cultures was not accomplished nor were any toxic catobolic waste products noted when the media was inoculated with test organisms. Attempts to analyze the trace element data with growth of the effluent leaves much to be desired. As this was preliminary work in its scope and technique development, the data can best be described as indicating the following:

2) The presence of high concentrations of iron and zinc (occasionally vanadium showed up at Middlesex) indicates a positive nutrient enrichment of the receiving waters. These "trace" elements are known requirements for the growth of the test organisms. Iron in particular, is extremely crucial and serves not only for the organisms tested, but has been demonstrated as an absolute necessity for massive Skeletonema blooms besides other phytoplanktonts. These two elements are being supplied in concentrations which indicate they will never be limiting in the receiving water. Further, our tests were only on cleared samples; how much of these and other elements are tied up in other organisms (which will be degraded by bacterial action and released) is unknown but could represent a huge supply of the needed trace elements. It should be noted that the sporatic testing for the effluents and the procedure for carrying samples, time of sampling and in general the

technique, must be considered exploratory and the conclusions only tentative and at best indicative of the situation. It was further noted that the detritus present in the effluents from the four treatment plants, ranged in weight from approximately 2 to 14 grams per 100 milliliters. This amount of detritus is certainly a greater source of nutrients than that tested in the cleared material. As only the filtrate was tested, the values reported are not truly representative of the total amount of nutrients (metals, nitrates, phosphate, etc.) available into the environment. No particular attention was focused on sodium, potassium, bromine or strontium since the areas under investigation were not considered to be limiting, nor were cultures reflective of absolute needs in the range tested. Attention was focused on the nutrient elements nitrogen, phosphorous and the essential trace elements iron, zinc, copper and the toxic elements chromium and lead. Nutrient elements were determined by standard colorimetric analysis and the metals by emission spectroscopy.

Where tremendous amounts of nutrients have already accumulated at bay and river bottoms, the obvious remedy to such polluted ecosystem would be to cease addition of such nutrients.

Red Tide Incident

On August 21, 1968, a brownish-red discoloration was noticed in the ocean waters from Riis Park to south of 73rd Street in Rockaway and estimated to be 5 miles long and 300 yards wide. A sample was collected and returned to the Commission laboratory for identification. The analysis showed one particular organism to be present in great numbers; 40,000 - 50,000 per milliliter. The organism appeared to have a "Euglenoid" type shape with a double flagellum at its anterior end. The average size of the organism was measured to be between 25 and 35 microns in length. The key structure in identifying the organism (as shown in the photograph) was a spiny projection from the anterior end about 4 microns long. This spine, along with the apparent rigidity of the cell, warranted the assigning of the group name "dino-flagellate".

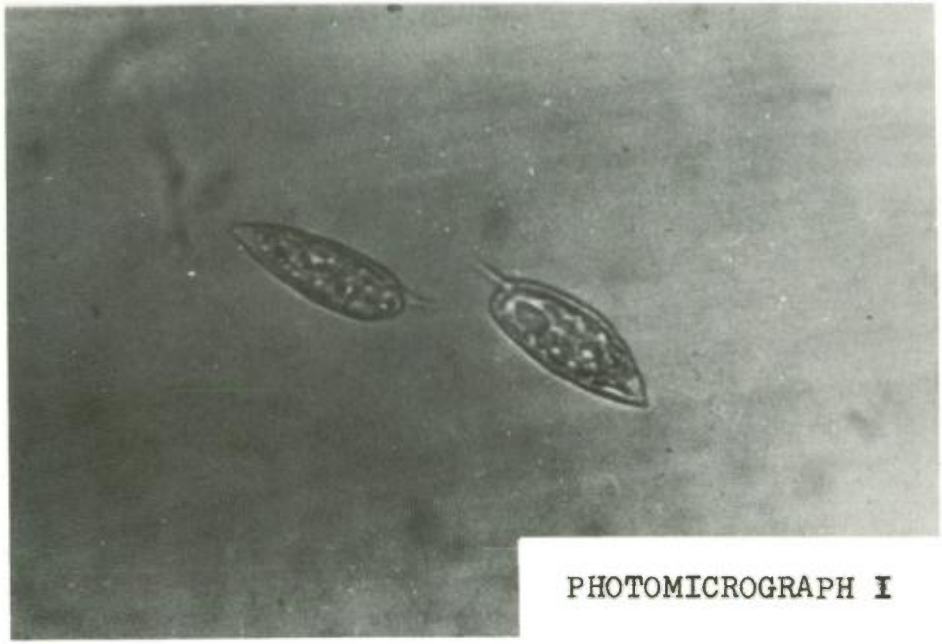
It was learned by this office that the Sandy Hook Marine Laboratory of the Department of the Interior located in New Jersey, had received many complaints by bathers in that area, of allergenic responses to some unknown condition near their beaches. Upon consultation with that laboratory, specifically, Dr. L. Walford, Director, and Mr. John Mahoney, Chief Biologist, it was found that the beaches in that area had been showing "red tide" since July 24, and that they were not aware that it extended as far north as the Rockaway Peninsula. Mr. Mahoney called our dino-flagellate Prorocentrum micans, and reported that they had corresponded to our value of 40-50,000 per milliliter. They had also found another dino-flagellate called Glenodinium breve, an organism we did not find. Mr. Mahoney stated that although human responses included regurgitating, eye irritation, coughing and similar allergenic symptoms, no serious illness of any nature was reported. The Sandy Hook Marine Laboratory accumulated data on the "red tide" from July 24 through mid-September when conditions ceased to be favorable and logarithmic death began.

It was felt by both our laboratory and the Marine Laboratory that conditions necessary for such dense growth

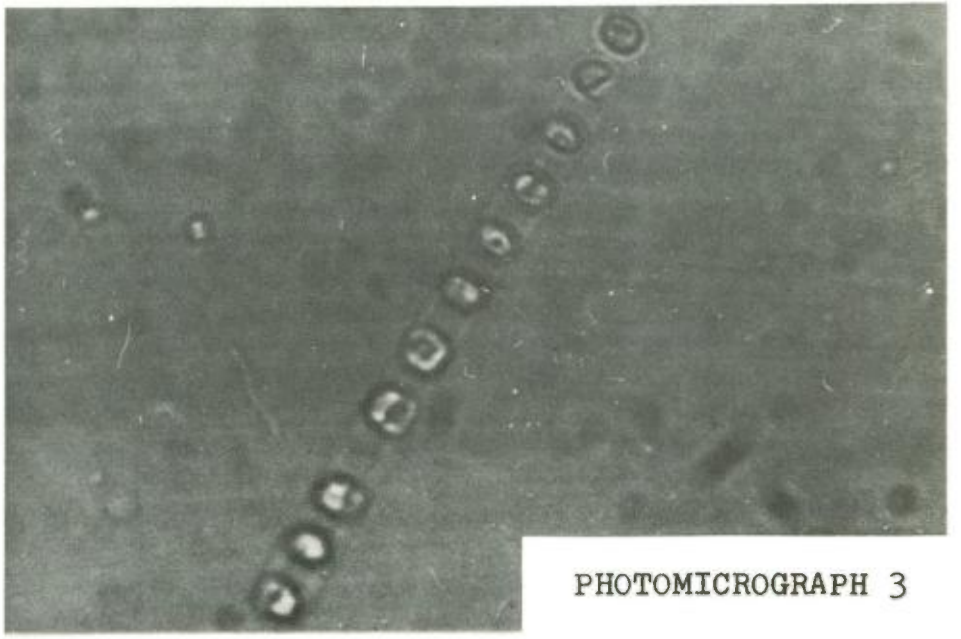
of a particular organism had to be optimum: temperature, oxygen content, and most important nutrient content. This latter factor must be controlled by the sewage plant in order to reduce the sum total of nutrient material discharging into the waterways. Mr. Mahoney pointed out that it was fortunate that the "red tide" was only mildly toxic but might not necessarily be such during future blooms.

PHOTO-MICROGRAPHY

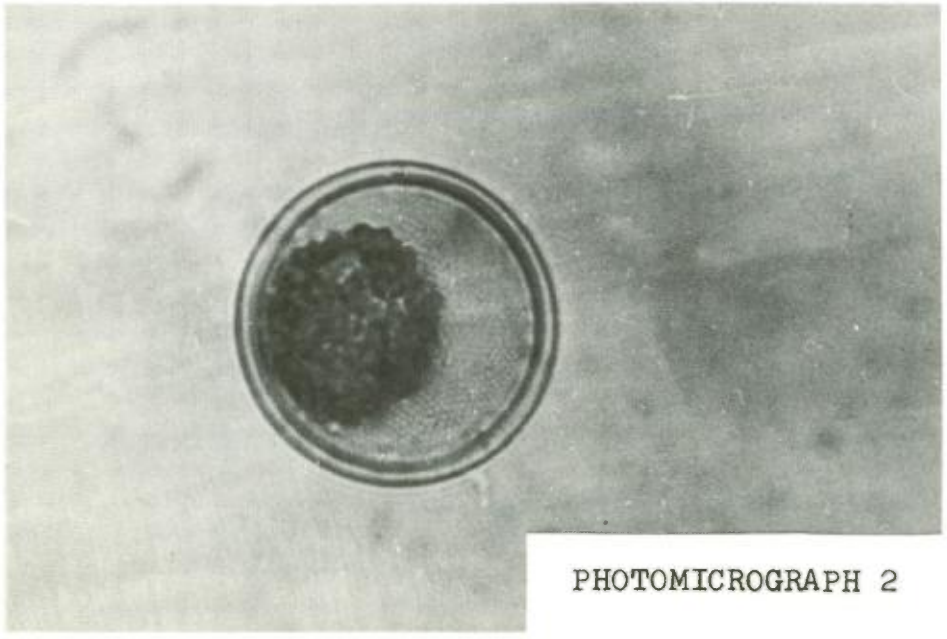
On the following page can be seen three photomicrographs taken with a 35 mm slide camera mounted over an American Optical Microstar microscope. The first slide refers to the discussion on the "red tide" incident. It shows the organism Prorocentrum micans, a dino-flagellate, at 337.5 power. Note the spiny projection at the anterior end. The second slide was chosen for presentation here because it represents perhaps one of the most beautiful, geometrically perfect organisms in the biological spectrum of life. It is a centric diatom, (species unknown) showing the shrinkage of the interior cytoplasm away from the silicaceous cell wall due to preservation with formaldehyde. Note the resolution of the criss-cross pattern on the surface of the frustule! The third slide shows both the filament Skeletonema costatum, a diatom and at the lower left and upper right the green coccoid algae Nannochloris atomus or Didymocystis as it was called by Dr. McLoughlin. These two organisms are the main ones enumerated each week at the Commission.



PHOTOMICROGRAPH I



PHOTOMICROGRAPH 3



PHOTOMICROGRAPH 2

1. The "red tide" organism, Prorocentrum micans at 337.5 power. (a dino-flagellate)

2. Spectacular, geometrically perfect photo of a centric diatom at 337.5 power. Shrinkage of cytoplasm away from silicoceous cell wall was caused by preservation with formaldehyde.

3. A filament of the diatom Skeletonema costatum clearly showing silicaceous fibers between cells. Chloroplasts are evident. Nannochloris atomus can be seen at lower right and upper left hand corners as a tiny double-celled unit.

FOR THE FUTURE

It is hoped that through further study, the Commission can gain new knowledge about water pollution through the science of biology. We hope to establish some correlation between the ecology of the waters in our district and the chemical constituents which determine this ecology.

INTERSTATE CONFERENCE ON BOAT POLLUTION

A conference to consider pollution problems from water borne sources was sponsored by the Interstate Sanitation Commission. The meeting was held on April 17, 1968 at the Sheraton Motor Inn in New York City and was attended by representatives of city, state, federal and interstate agencies as well as boat owners and others with interests in the boating field. The conference was held in two sessions and included a luncheon with Alexander Aldrich, Executive Director of the Hudson River Valley Commission, as guest speaker.

The morning session opened with a welcome by Dr. Natale Colosi, Chairman of the Interstate Sanitation Commission, and introductory remarks by Thomas R. Glenn, Jr., Director of the Commission. The remainder of this session was a discussion concerned with the present status of federal activity in boat pollution moderated by Lester Klashman, Director of the Northeast Region of the Federal Water Pollution Control Administration, U. S. Department of the Interior. Participants on this panel were John M. Rademacher, Director of the Division of Technical Services of the Federal Water Pollution Control Administration, and Don Nicoll, Administrative Assistant of the Office of Senator Edmund W. Muskie.

Subjects for discussion included legislation presently before Congress, federal activity underway in this field and the feasibility of various types of solutions to the problem.

The afternoon session centered on the approach to boat pollution problems in the tri-state area with Senator John J. Marchi as moderator. Senator Marchi is the Chairman of the New York State Joint Legislative Committee on Interstate Cooperation. Panel participants were Roger H. Gilman, Director of Planning and Development, Port of New York Authority; Richard Sullivan, Director of Clean Air and Water, New Jersey State Department of Health; Commissioner Herbert B. Halberg, Commissioner of Marine and Aviation of New York City; and Moulton H. Farnham, Editor of "Boating".

Various aspects of the boat pollution problem were discussed during this session. Topics included were: the magnitude of the problem, abandoned ships in the harbor, feasibility of control devices on small boats, disposal of wastes from holding tanks and alternate methods of disposal.

The proceedings of the Interstate Conference on Boat Pollution are available and can be obtained by writing to the Interstate Sanitation Commission, 10 Columbus Circle, New York, New York - 10019.

EXPANSION OF THE INTERSTATE SANITATION COMMISSION

This year, New York, New Jersey and Connecticut and the Federal Government have supplied increased funds to expand the scope of the Commission's activities.

The Interstate Sanitation Commission has acquired additional quarters to house a new laboratory. These larger quarters will permit the laboratory to increase its manpower and equipment and therefore handle a larger and more comprehensive workload. Space vacated by the present laboratory will provide room for additional office personnel and equipment.

Seven new positions have been created and are presently being filled. These are an Associate Public Relations Specialist, Senior Engineer, Data Analyst and Programmer, Associate Statistician, two Assistant Chemists and a Secretary. The additional positions are included on the following organizational chart.

A mobile lab has been purchased for the purpose of analyzing wastes in the field and also will be used for on-site training of treatment plant personnel to analyze their wastes. This training of plant operators to perform laboratory analyses in accordance with standard procedures is a needed function in the Interstate Sanitation District and should improve the effectiveness of plant operation.

The combined sewer problem in the Interstate Sanitation District is one of great magnitude. Such sewers have a tremendous influence on receiving water quality and restrict the possible usages of many water areas. This Commission has prepared a proposal for a special combined sewer investigation which should lead to better control and protection for receiving waterways.

To expand the capabilities of the laboratory, several new pieces of equipment have been ordered. These include a total organic carbon analyzer, an automatic COD analyzer, a Warburg respirometer, an atomic absorption unit and a temperature humidity controlled room.

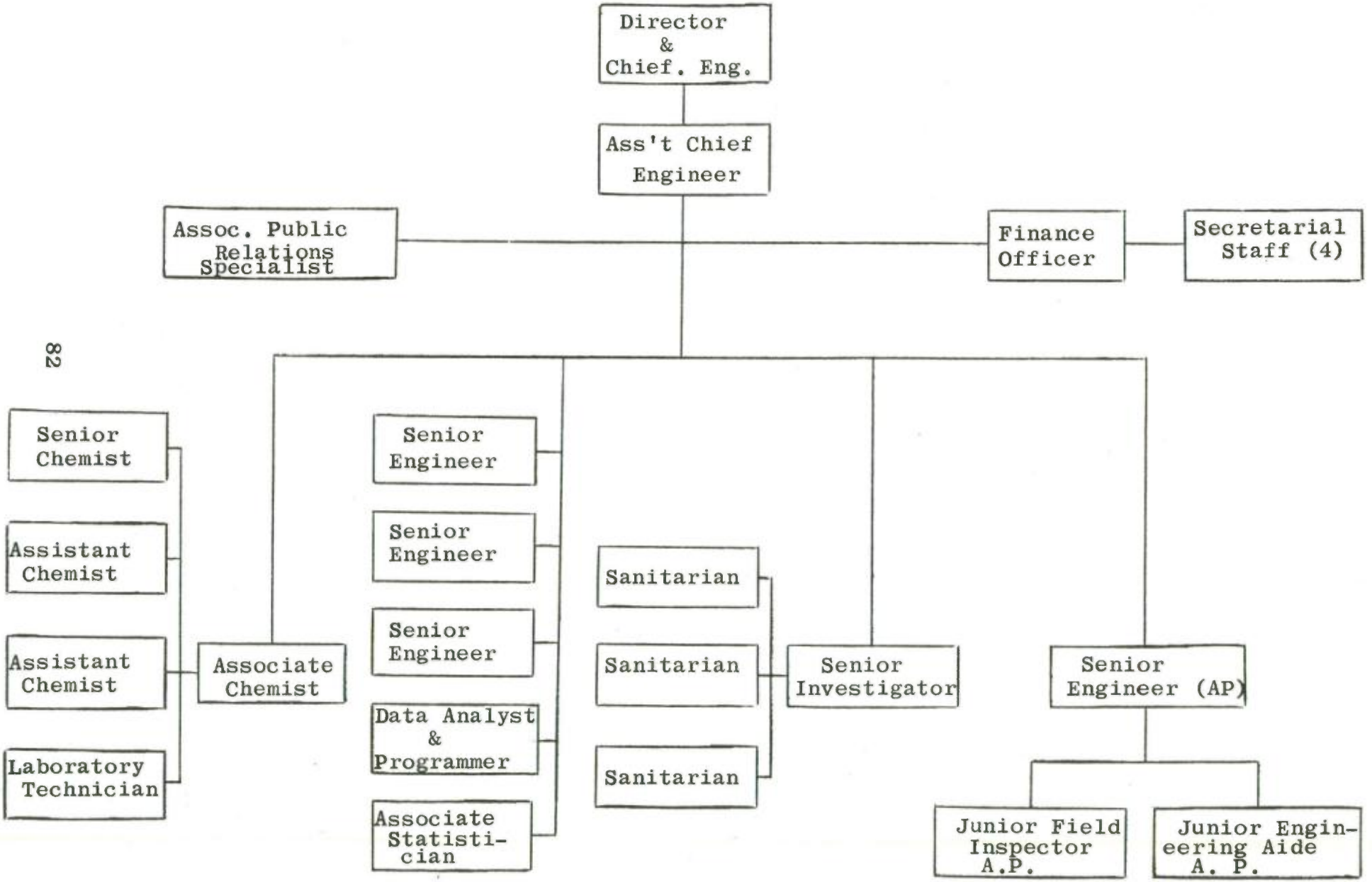
For continuous surveillance and recording of water quality data in the Interstate Sanitation District, the Commission maintains two robot monitors. One is located on the Arthur Kill and the other is located on the East River. A third unit has been authorized for installation on Newark Bay. The Commission monitors measure dissolved oxygen, water temperature, pH and dissolved chlorides.

Analysis of data pertaining to water quality, industrial wastes, air pollution and waste treatment plants will be accomplished with the aid of an IBM Quiktran II time sharing terminal which has been ordered by the Commission. This terminal is connected to a 7040-7044 data processing system and has typewriter, punch card and punch tape capabilities. Commission employees are presently being trained to familiarize them with the operation and potential of this new unit.

Since its origin, the Commission has kept up a continuous surveillance of the operation of municipal waste water treatment plants within the Interstate Sanitation District. There is now a program underway to survey all industries with property on District Waters. The objective of this survey is to obtain information concerning their operation, water usage and waste water discharges. Industries will be sampled on a routine basis. These data will be used to provide an accurate assessment of the industrial waste situation in the District and will provide a basis for recommending enforcement regulations.

This expanded program of the Interstate Sanitation Commission in cooperation with local, state, and Federal agencies will provide a unified water pollution abatement program in the New York Metropolitan Area.

ORGANIZATION CHART OF THE INTERSTATE SANITATION COMMISSION



III. A I R P O L L U T I O N

New York - New Jersey

AIR POLLUTION

GENERAL

The Commission, in 1968, continued its activites in the area of air pollution control on a limited basis. This was done as the Commission expected either to withdraw completely from all aspects of air pollution control in the New York metropolitan area to be replaced by the newly created Mid-Atlantic States Air Pollution Control Commission or to expand itself into the primary regional agency with responsibility for metropolitan air quality. As this is written, the assignment of the responsibility for regional air quality has not been made and the Commission continues in its function as a liaison between the several air pollution control agencies in the area. The Commission's major activities for the year have been the coordination of air pollution forecast watches and the reporting and investigation of citizen air pollution complaints.

To serve as coordinator of all local air pollution control agencies during periods of high air pollution potential, the Commission maintains close ties with the Air Pollution sections of the New York and New Jersey State Health Departments, the New York City Environmental Protection Administration and the regional office of the United States Weather Bureau. At such times as the Weather Bureau issues high air pollution potential advisories, the Commission collects ambient air quality data from each of the participating agencies and relays this data to all other agencies, together with other current meteorological information. The parameters of air quality with which the Commission is concerned are concentrations of carbon monoxide, sulphur dioxide and suspended particulates. Thus far in 1968, there have been three periods of high air pollution potential. None of these progressed to the level of air pollution alerts.

The Commission also endeavors to serve the citizens of the metropolitan area by acting upon air pollution nuisance complaints which cannot be handled by their local air pollution control agency. These situations arise when

the source of the pollution lies in one state and its effects are felt in an adjacent state. In cases such as these, the Commission attempts to verify the existence of the condition and then attempts to locate its source. If the Commission has sufficient reason to believe that air pollution of an interstate nature exists, it will then notify the air pollution agency with jurisdiction in the source area.

To receive the complaints of area residents, the Commission's telephones are staffed 24 hours a day, 7 days a week. So that immediate and continuous air quality data is available to the Commission, three air sampling stations and a mobile air quality laboratory are maintained. The three air quality sampling stations consist of a smoke shade recorder and sulphur dioxide analyzer at Willowbrook, Staten Island, and a smoke shade recorder at the sewage treatment plant of the Rahway Valley New Jersey Sewage Authority. In addition, a recording wind guage is maintained at the sewage treatment plant of the Linden Roselle New Jersey Sewage Authority.

In 1968, the bulk of complaints received originated along the New York-New Jersey border in the vicinity of Staten Island.

The Commission has also completed and issued in 1968 a survey of odor sources within the region and these were sent to the appropriate agencies.

The future activities of the Commission in the field of air pollution control will, of course, be influenced by the final designation of the control agency for the area. In the interim, the Commission will attempt to continue, in addition to the functions already mentioned, several other programs which relate to the recent Federally designated New York-New Jersey-Connecticut metropolitan air shed.

The odor survey will be updated and indexed by description to facilitate the identification of sources in future episodes. A roster is in preparation identifying and locating all air quality monitoring

stations within the metropolitan area. This roster will be kept current and will serve as an aid in the correlation of all data relating to air quality and in the verification of reported air pollution conditions.

The Commission is also considering several other projects for 1969 in which it can continue to serve as a liaison between the numerous control agencies of the greater New York area. However, all future activities are dependent upon the Commission's remaining active in the air pollution control area.

NEW YORK-NEW JERSEY INTERSTATE AIR POLLUTION ABATEMENT CONFERENCE PHASE II

In October, 1965, Federal abatement action was requested by Governor Rockefeller of New York, who asked Secretary John W. Gardner to call an Abatement Conference under the terms of the Federal Clean Air Act on the basis that air pollution arising in New Jersey was adversely affecting the health and welfare of New York residents. Secretary Gardner broadened the scope of the Conference by initiating concurrent abatement action concerning air pollution originating in the State of New York, which might have possible adverse effects on the health and welfare of persons in New Jersey.

The purpose of an Abatement Conference is to provide information on which the Secretary of Health, Education and Welfare can base recommendations for abatement of an interstate air pollution problem in accordance with provisions of the Clean Air Act of 1963. The Secretary is empowered to take additional abatement action if his recommendations are not carried out.

The first session of the Conference, which was primarily concerned with an investigation of air pollution caused by sulphurous compounds and carbon monoxide, was convened on January 3, 1967, at the Statler Hilton Hotel, Seventh Avenue and 33rd Street, New York, New York.

The second session of the Conference was held January 30 through February 6 and was primarily concerned with sources of particulate matter, such as smoke and dust. In addition, reports were made on remedial action taken in compliance with recommendations issued by the Secretary of Health, Education, and Welfare March 21, 1967. These recommendations were derived from the first phase of the Conference, held January 3 through 19, 1967, which focused on sources of sulfur oxides and carbon monoxide. At the time, they were unanimously proposed to the Secretary by the official Conference participants. Called by the Secretary at the request of the State of New York, the Conference will remain in continuous session, subject to the call of the Presiding Officer, until a regional agency is in operation.

The proposed findings and recommendations of this phase of the Conference were presented by William H. Megonnell, Presiding Officer of the Conference and Associate Director of the National Center for Air Pollution Control. Representatives of the Department of Health, Education and Welfare; the States of New York and New Jersey; and the City of New York who commented were, respectively:

Mr. Robert Harris, Abatement Program, National Center for Air Pollution Control; Mr. Alexander Rihm, Jr., Assistant Commissioner for Air Resources, New York State Health Department; Mr. Richard Sullivan, Director of Division of Clean Air and Water, New Jersey State Health Department; and Mr. Austin Heller, Commissioner, New York City Air Pollution Control Department.

Official participants in the Conference are delegates of the Department of Health, Education, and Welfare, the States of New York and New Jersey, and the Interstate Sanitation Commission. The New York State delegation includes representatives of the control agencies in the cities of Mr. Vernon, New Rochelle, New York, and Yonkers and the counties of Nassau, Rockland, and Westchester.

Following this session of the Conference, the proposed recommendations will be forwarded to Acting Secretary Wilbur J. Cohen, who is empowered to issue his own recommendations for abatement and fix a time schedule for compliance. If adequate progress is not made in the prescribed time, he may appoint a board of five or more persons to hold a public hearing. He may then forward the board's findings and recommendations to the States involved and to the parties responsible for alleged sources of interstate air pollution and again fix a time schedule for compliance. Then, if abatement measures are still not taken, he may ask the Attorney General to initiate action in the United States Courts.

The geographical area involved in the proceeding consists of New York City and Nassau, Rockland, and Westchester Counties in New York State, and nine counties in New Jersey: Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, and Union.

SUMMARY OF REPORTS ON PHASE 1 RECOMMENDATIONS

1. Interstate Air Pollution Control Agency.

Cognizance is taken of the fact that the States of New York and New Jersey have adopted legislation to create, by compact, a Mid-Atlantic States Air Pollution Control Commission; Connecticut has passed similar legislation, Delaware and Pennsylvania have been invited to join, and the compact is under consideration by the Congress.

11, 111 and 1V. Control of Emissions of Sulfur Dioxide from Power Generation Plants and Space Heating.

The States of New York and New Jersey have adopted regulations to control sulfur dioxide emissions from fuel combustion in accordance with the recommended maximum sulfur content limitations. It appears that sufficient quantities of fuels not exceeding 1% sulfur by weight will be available for steam electric power generating facilities to permit compliance with Recommendation 11 by October 1, 1969. In fact, some power plants already have obtained and voluntarily are using fuels which meet these limitations. Information presented at the Phase 11 Conference indicates that sufficient quantities of 1% sulfur fuels will be available by May 1, 1969, to meet all space heating and other domestic, commercial and industrial needs in the entire Abatement Area; but low-sulfur fuels meeting the limitations of Recommendations 111 and 1V(i.e., natural gas, coal containing not in excess of 0.2% sulfur by weight, and oil containing not in excess of 0.3% sulfur by weight) will not be available in sufficient quantities to meet all of the fuel needs of the entire Abatement Area by October 1, 1969.

V. Control of Emissions of Sulfur Compounds from Industrial Processes.

New Jersey reported that it has instituted vigorous enforcement of Chapter VIII of its Air Pollution Control Code in the New Jersey portion of the bi-State metropolitan area. The problem and the Code merit

continuing study and surveillance, however, and it is agreed by the Conference Participants that the State of New Jersey submit to the Presiding Officer a report of further steps taken in this regard in the period ending December 31, 1968, such report to be sumitted by January 30, 1969.

VI. Control of Carbon Monoxide Emissions.

Monitoring of carbon monoxide is being conducted in New York and New Jersey. California Oil Company has informed the Presiding Officer that it has taken action to control its contribution to local carbon monoxide levels.

VII. Control of Emissions from the Abex Corporation, Mahwah, New Jersey.

Abex Corporation has installed particulate control equipment which reportedly complies with the pertinent New Jersey emission codes. Complaints of air pollution attributed to this source persist in New York State, but that State's air quality objectives are not being exceeded. The States of New York and New Jersey agree to conduct further surveillance and study and to exchange technical information regarding this matter along several lines.

PHASE II-- CONFERENCE RECOMMENDATIONS

The attached findings and recommendations are those reached by the official participants to Phase II of the New York--New Jersey Metropolitan Area interstate air pollution abatement conference, and read into the record of the conference on April 19, 1968.

Along with the rest of the record, they will be forwarded to the Secretary of Health, Education, and Welfare for his consideration. Should the Secretary believe that effective progress toward abatement of the air pollution is not being made, and that the health or welfare of any person is being endangered, he shall recommend to the appropriate agencies that remedial action be taken. Such recommendations may not necessarily be the same as those attached.

GENERAL FINDINGS
PARTICULATE AIR POLLUTION

It is found that:

(a) The present concentration of suspended and settleable particulate matter in the Abatement Area endangers the health and welfare of residents in the area.

(b) The New York State Ambient Air Quality Objectives already adopted for the New York State portion of the area are consistently exceeded in a considerable portion of the Abatement Area.

RECOMMENDATION I
COMBUSTION OF SOLID FUELS AT STATIONARY SOURCES

It is found that:

(a) Burning of solid fuels generate more than one-fourth of the particulate emissions in the Abatement Area.

(b) Solid fuels create considerably more particulate pollution per unit of heat than do gaseous and liquid fuels.

(c) Technology is available to control particulate emissions from combustion of solid fuels.

Therefore, it is recommended that:

1. New solid-fuel burning units with a gross heat input of 200 million Btu or more per hour emit no more than 0.1 pound of particulate per million Btu; those less than 10 million Btu per hour emit no more than 0.6 pound of particulate per million Btu; and those between 10 million and 200 million Btu per hour emit no more than the amount determined by linear interpolation between the 0.6 pound per million Btu values.

2. Existing solid-fuel burning units meet the requirements described in Part I of this recommendation no later than October 1, 1971.

RECOMMENDATION II
DISPOSAL OF SOLID WASTES

It is found that:

(a) Burning of solid wastes contributes one-fifth of the particulate air pollution in the Abatement Area.

(b) Open burning of solid wastes is prohibited in New York City and is regulated throughout the remainder of the Abatement Area.

(c) About one-third of the solid wastes is burned in on-site and municipal incinerators, most of which are inadequately designed or equipped to control particulate pollutants.

(d) Many existing landfill sites within the Abatement

Area are approaching capacity, and generation of even greater quantities of solid wastes is in prospect. As a result, the quantities of wastes disposed of by burning will increase, unless additional landfill sites or alternate means of disposal are adopted.

(e) Incinerators can be equipped and operated so that particulate emissions are far less than from existing incineration operations in the Abatement Area.

(f) The City of New York has adopted incinerator performance standards which, if applied areawide, would reduce current incinerator emissions 85%. Under the schedule mandated by Local Law 14, as amended, on-site incinerators in the City will be removed from service or upgraded to meet these standards within three years.

(g) The State of New Jersey has proposed incinerator standards comparable to those adopted by the City of New York.

(h) The State of New York has adopted regulations applicable to Westchester and Rockland Counties which require that incinerators meet performance standards that will result in substantial reduction of emissions; Nassau County has adopted more restrictive requirements for existing incinerators.

(i) Means of solid waste disposal other than incineration, which create less or no air pollution, have been proposed or are available.

Therefore, it is recommended that:

1. Incinerator emission standards proposed on January 26, 1968, as Chapter XI of the New Jersey Air Pollution Control Code, be adopted by that State.

2. Comprehensive studies of methods, both short-and

long-range, for disposal of solid wastes generated in the Abatement Area be undertaken and coordinated by appropriate agencies of the States of New York and New Jersey; and a progress report of the study, including cost-effectiveness analyses and re-evaluation of variances for open burning, be submitted to the Presiding Officer and all Conference Participants within one year after issuance of these recommendations.

RECOMMENDATION III
INDUSTRIAL PROCESSES

It is found that:

(a) Industrial processes generate one-tenth of the particulate emissions in the Abatement Area.

(b) Although industrial processes are controlled to varying degrees, application of available technology to all sources could reduce the total present industrial-process particulate emissions by at least 80%.

Therefore, it is recommended that:

1. The emission of particulate matter into the atmosphere from new industrial processes be subject to limitation as a function of process weight, or equivalent method, but not less stringent than those set forth in Table I. (Process weight includes raw materials and solid fuels but not liquid and gaseous fuels.)

2. The emission of particulate matter into the atmosphere from existing industrial processes be subject to the same limitations set forth in No. 1 above, effective January 1, 1971.

3. When toxic materials are emitted, stringent emission limits be applied as necessary to protect the public health.

TABLE I

Process Weight	Allowable Emission
lb/hr	lb/hr
100 or less	0.5
1,000	2.3
5,000	6.7
10,000	10.8
25,000	20.0
50,000	32.0
75,000	43.0
100,000 or more	50.0

RECOMMENDATION IV
CONTROL OF FINE PARTICULATES AND VISIBLE EMISSIONS

It is found that:

(a) The major portion of visible air pollution discharged to the atmosphere in the Abatement Area is from the burning of fuels and solid wastes and industrial processes; marine vessels and other sources also contribute, to a lesser degree, to the visible air pollution in the area.

(b) In the Abatement Area, fine particles, smaller than 5 microns in mean diameter, constitute more than 50% by weight of the total quantity of particulate matter emitted to the atmosphere.

(c) Fine particulates, those less than 5 microns in size, are more effective in obscuring visibility than are larger particles. Most particles which penetrate past the upper respiratory system and are deposited in the lungs are within this size range. Such fine particles also serve as vehicles for the introduction of sulfur dioxide and other gaseous contaminants into the lungs.

Therefore, it is recommended that:

1. Effective no later than January 1, 1971, visible emissions of air contaminants to the atmosphere be limited to a shade or density not more than that designated as No. 1 on the Ringelmann Chart or an opacity which obscures an observer's view to the same degree, or equivalent limitations, subject to such exceptions for limited periods as may be necessary for reasons of practicability.

RECOMMENDATION V
COMBUSTION OF FUEL OIL AT STATIONARY SOURCES

It is found that:

(a) The burning of distillate and residual fuel oil generates 21% of the particulate emissions in the Abatement Area.

(b) Combustion of fuel oil generates more particulate pollution per unit of heat than does combustion of gaseous fuels.

(c) Approximately 50% of the particulate matter emitted by oil burners is combustible; most of this could be eliminated by improving combustion efficiency.

(d) Greater operational problems are encountered when burning Numbers 5 and 6 fuel oil than when burning fuel oils of lower viscosity.

Therefore, it is recommended that:

1. Performance standards and appropriate enforcement procedures be adopted to ensure that when Number 5 or 6 fuel oil is burned, oil burners and auxiliaries perform in a manner to provide optimum combustion for minimum emission of particulates. Such standards and enforcement provisions shall become effective not later than October 1, 1969.

RECOMMENDATION VI
OPERATION OF COMBUSTION EQUIPMENT AND INCINERATORS

It is found that:

(a) An important adjunct to properly designed systems and devices in achieving maximum control of air pollutant emissions is the proper operation of such equipment.

(b) The City of New York recognizes the importance of proper operation of combustion equipment in relation to air pollution control, and has initiated a training program for building superintendent and custodians.

Therefore, it is recommended that:

1. Instructional programs in air pollution control be developed, expanded and made readily available, as soon as practicable, to operators of combustion equipment and incinerators in the bi-State Metropolitan Area.

RECOMMENDATION VII
GASOLINE AND DIESEL POWERED MOTOR VEHICLES

It is found that:

(a) Gasoline-powered motor vehicles generate 9% of the particulate emissions in the Abatement Area.

(b) Diesel-powered motor vehicles generate 5% of the particulate emissions in the Abatement Area and over 50% of emissions from such vehicles are less than 5 microns in size.

(c) Active work is underway by conferee agencies to develop test equipment and methods for assessing emissions from gasoline and diesel fueled motor vehicles.

Therefore, it is recommended that:

1. Upon the call of the Presiding Officer, not later than one year after issuance of these recommendations, the Conference Participants meet to report progress on studies to control particulate emissions from motor vehicles, with a view toward recommending practicable steps to reduce such emissions.

REGIONAL AIR POLLUTION WARNING SYSTEM

This past year, the Commission continued its role as coordinator and central office for the New York-New Jersey Regional Air Pollution Warning System. Concentration data of the three pollutants (SO_2, CO and Smoke Shade) from the New York City Laboratory at East 121st Street, and from New Jersey Health Department stations located in Hackensack, Camden, Newark, Bayonne, Perth Amboy, and Paterson. Data from the New Jersey stations is telemetered to their central office in Trenton and then referred to the Commission office by telephone.

When the Mid-Atlantic States Air Pollution Control Commission was proposed, the Commission had to put aside their plans for having data from the planned remote monitoring stations telemetered directly into a central system at the Commission office. However, due to the delay in forming a new Commission, the States have requested that receiving equipment be installed now.

In 1968 up until the date of this writing there were 3 Watches and no First Alerts called under the standards of the warning system. The watches which occurred in June and September were based on the revised standards approved by the Cooperative Committee on Interstate Air Pollution in 1967. Below is an explanation of the new system followed in tabular form.

The Criteria

1. Status - "Forecast" - an internal watch shall be actuated by the United States Weather Bureau advisory that a high air pollution potential will exist for the next thirty-six hours.

2. Status - "Alert" - at the initiation of, and periodically during, a "Forecast" period, air quality information for the immediately preceding twenty-four-hour period shall be reviewed. If for any consecutive six-hour period during the last twelve hours, the sulphur dioxide dosage is equal to or greater than 2.0 part per million-hours and soiling index is equal to or

greater than 25 RUD-hours/1000 lin. ft.

OR

if for any consecutive six hours in the immediately preceding twelve hours the carbon monoxide dosage is equal to or exceeds 180 parts per million-hours

OR

the sulphur dioxide dosage for the last twenty-four-hour period is equal to or greater than 6.0 part per million-hours and the dosage is increasing and the soiling index is equal to or greater than 100 RUD-hours/1000 lin. ft.

AND

adverse meteorological conditions are predicted for at least an additional twelve hours:

an "Alert" status has been reached

3. Status - "Warning" - If during an "alert" period for any consecutive six-hour-period during the last twelve hours, the sulphur dioxide dosage is equal to or greater than 3.0 part per million-hours and the soiling index is equal to or greater than 25 RUD-hours/1000 lin. ft.

OR

if for any consecutive six hours in the immediately preceding twelve hours the carbon monoxide dosage is equal to or exceeds 300 parts per million-hours

OR

the sulphur dioxide dosage for the last twenty-four-hour period is equal to or greater than 9.0 parts per million-hours and the dosage is increasing and the soiling index is equal to or greater than 100 RUD-hours/1000 lin. ft.

AND

adverse meteorologic conditions are predicted for at least an additional twelve hours:

a "Warning" status has been reached

4. Status - "Emergency" - If during "warning" period in any consecutive twenty-four-hour period the sulphur dioxide dosage is equal to or greater than 15.0 part per million-hours and the soiling index is equal to or greater than 200 RUD-hours/1000 lin. ft.

AND

adverse meteorologic conditions are predicted for at least an additional twelve hours:

an "Emergency" - status has been reached

5. Status - "Termination" - Once declared, any status reached by application of these criteria shall remain in force until the high air pollution potential advisory is ended.

CRITERIA FOR AIR POLLUTION WARNING SYSTEM

EFFECTIVE OCTOBER 20, 1967

STATUS		TIME INTERVAL CONSIDERED PRIOR TO STATUS (Hrs.)	(1) SULPHUR DIOXIDE (ppm-Hrs.)	(2) RUD (RUD-Hrs.)	(3) CARBON MONOXIDE (ppm-Hrs.)	(4) Forecast (Hrs.)
Forecast		-	-	-	-	36
ALERT	1+2+4 or 3+4	*	2.0	25	180	12
	1+2+4	24	6.0 ↑	100		12
WARNING	1+2+4 or 3+4	*	3.0	25	300	12
	1+2+4	24	9.0 ↑	100		12
EMERGENCY 1+2+4		24	15.0 ↑	200		12
TERMINATION						0

*Any consecutive 6 hrs. in the last 12 hrs.

SUMMARY OF AIR POLLUTION EMERGENCIES

JUNE 5, 1968

At 12 noon the Commission was informed by the U.S. Weather Bureau that a high air pollution potential would exist in the metropolitan area for at least the next 36 hours. In subsequent advisories the Commission was advised of the continuence of these conditions until 12 noon June 8, when an approaching cold front improved ventilation sufficiently to terminate the pollution potential. During this period pollutant concentration did not exceed the prearranged alert levels.

SEPTEMBER 17, 1968

At 12 noon the Commission was advised by the U.S. Weather Bureau that a stagnating high pressure system extending from Eastern Canada to the Carolinas would dominate the area for the next 36 hours, and that a high air pollution potential would exist. The Commission in response to this advisory began an air pollution forecast watch. This watch continued until noon, September 19, at which time the U.S. Weather Bureau advised the Commission that winds had increased sufficiently to terminate the advisory. However the bureau added, the high pressure system responsible for the stagnating conditions will continue to dominate the area. Levels of pollutant concentration did not reach levels at which an air pollution alert was deemed necessary.

SEPTEMBER 20, 1968

At 2 p.m. the Commission was advised that the high pressure system, responsible for the advisory of September 17, would continue to dominate the area and ventilation was expected to decrease sufficiently to create a high air pollution potential. This second advisory was continued until the high pressure system began to shift to the south on September 23. The advisory was terminated at 12 noon September 23. Pollutant levels did not rise to critical levels during this second advisory.

AMBIENT AIR QUALITY OBJECTIVES

In 1964 the State of New York established air quality objectives to be met in the various regions of the state. Regions were designated as A, B, C or D.

Recognizing the variations in land use throughout these regions, criteria were further divided into subregional objectives.

The subregional types established were:

Subregion I- predominately used for timber and agricultural crops, dairy farming, and recreation. Habitation and industry sparse.

Subregion 2- single-and two-family residences, small farms, and limited commercial services and industrial development.

Subregion 3- densely populated, primarily commercial, office buildings, department stores, and light industry such as electronics and instruments, apparel and finished products, printing and publishing, and food and kindred products.

Subregion 4- primarily industrial, light and heavy industry such as chemical and allied products, primary ferrous and nonferrous metals, stone, clay, glass, petroleum, and coal.

All areas within the state are designated by a region letter and subregion number. Areas within the metropolitan area are designated as A-1, B-1, B-2, B-3, C-2, C-3.

Criteria for these regions and subregions are listed in Table I.

Air quality regions in the metropolitan area are designated on the accompanying map.

TABLE I

NEW YORK STATE REGIONAL AMBIENT AIR QUALITY OBJECTIVES

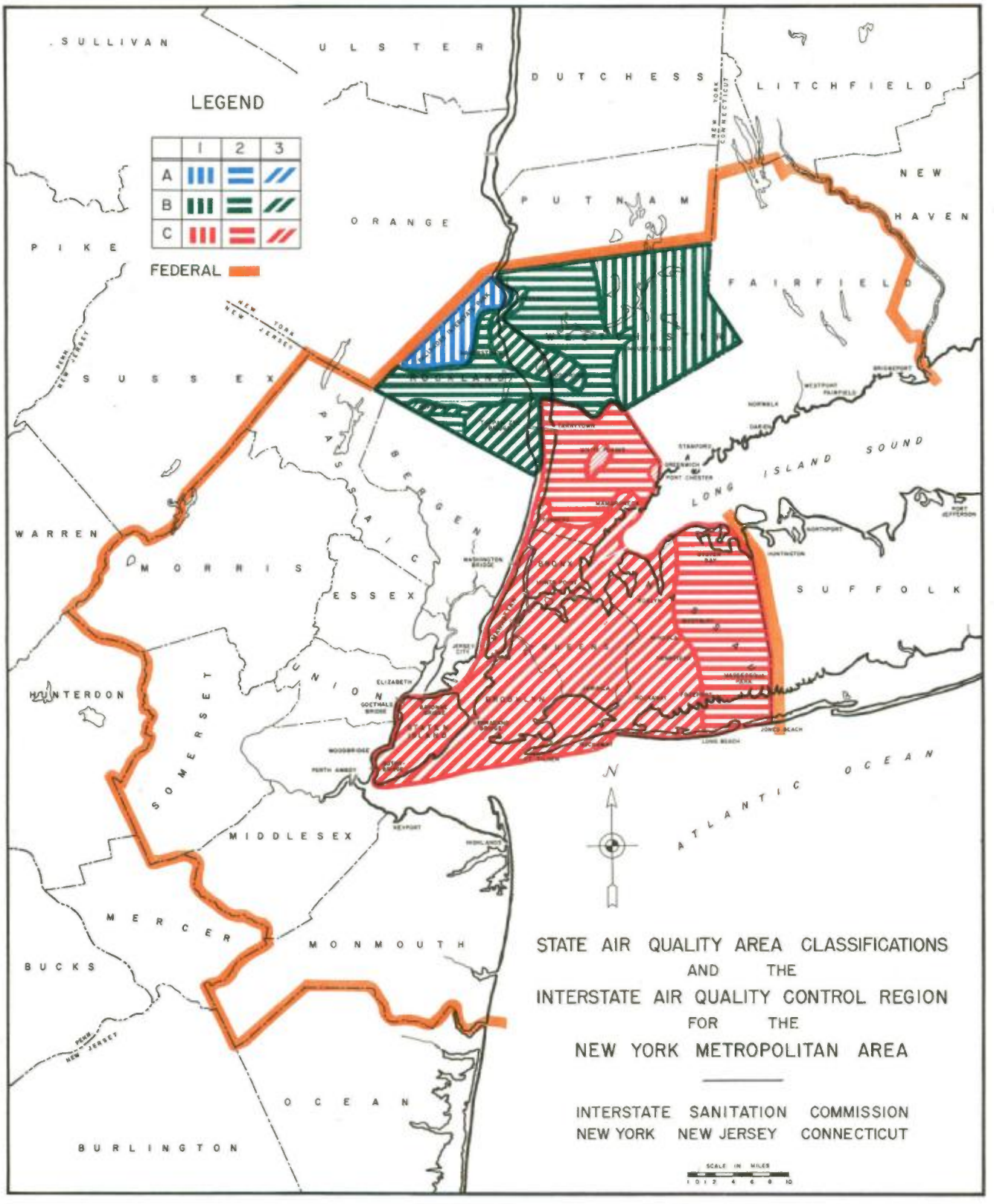
Pollutant Type	Region and Subregion Designation					
	A1	B1	B2	B3	C2	C3
Particulates						
Suspended particulates per 24 hour sampling period(microgm./m^3)						
50% of values less than	40	45	55	65	65	80
84% of values less than	60	70	85	100	100	120
Settleable Particulates per 30 day sampling period(mg./cm/mo)						
50% of values less than	0.30	0.30	0.60	0.60	0.60	0.90
84% of values less than	0.35	0.35	0.80	0.80	0.80	1.20
Gases and Vapors (24 hour averages)						
Sulfur Dioxide (in ppm) to be less than given value for 99% of the time						
on an annual basis	0.1	0.1	0.1	0.1	0.1	0.1
on an hourly basis	.25	.25	.25	.25	.25	.25

Applicable to all regions and subregions

Sulphuric acid mist	0.1 mg/m^3
Beryllium	0.01 microgm/m^3
Hydrogen Sulfide	0.10 ppm for 1 hour
Carbon Monoxide to be less than given value for following % of time on annual basis:	85% 15ppm/8hrs 100% 30ppm/8hrs 99% 60ppm/1hr

	Subregion			
	1	2	3	4
Oxidents(includes ozone, petrochemical aerosols and other oxident contaminants)	.05	.05	.10	.10
Fluorides(as HF) in ppb.	1	1	3	4
Soluble Fluorides (as F)	35ppm	35ppm	-	-

Other substances which are limited but not analytically defined are Smoke, Odorous Substances, Radioactive Substances and Toxic or Deleterious Substances.


LEGEND
1 2 3
A
B
C
FEDERAL
SULLIVAN
ULSTER
DUTCHESS
LITCHFIELD
NEW HAVEN
PUTNAM
ORANGE
PIKE
FAIRFIELD
SUSSEX
BERGEN
PASSAIC
WARREN
MORRIS
ESSEX
HUNTERDON
SOMERSET
UNION
MIDDLESEX
MERCER
MONMOUTH
BUCKS
OCEAN
BURLINGTON
LONG ISLAND SOUND
ATLANTIC OCEAN
SUFFOLK
N
STATE AIR QUALITY AREA CLASSIFICATIONS
AND THE
INTERSTATE AIR QUALITY CONTROL REGION
FOR THE
NEW YORK METROPOLITAN AREA
INTERSTATE SANITATION COMMISSION
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 0 2 4 6 8 10

SEWAGE TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1968

Plant	Receiving Water Class	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
CONNECTICUT						
Fairfield County						
Bridgeport - East Side	A	1950+	10.8	14.0	Primary	47,000
- West Side	A	1951+	23.5	17.0	Primary	109,000
Darien	A	1956+	1.0	1.2	Primary	6,500
Fairfield	A	1967+	4.2	6.0	Secondary	30,000
Greenwich - Central	A	1964+	6.5	8.5	Secondary	42,000
Norwalk	A	1953+	7.6	15.0	Primary	55,000
Stamford	A	1943+	10.8	10.0	Primary	60,000
Stratford	A	1953+	5.9	4.8	Primary	40,000
Westport	A	1960	0.7	0.6	Secondary	5,000
New Haven County						
Milford - Gulf Pond	A	1960	1.8	2.4	Secondary	6,000
- Harbor	A	1937	0.6	0.5	Secondary	4,000
- Town Meadows	A	1954	1.9	1.2	Secondary	10,000
New Haven - Boulevard	A	1959+	11.8	13.8	Primary	63,100
- East Shore	A	1953	7.3	12.5	Primary	35,000
- East Street	A	1966+	13.5	22.5	Primary	67,100
West Haven	A	1950+	5.2	3.3	Primary	40,000
NEW JERSEY						
Bergen County						
Edgewater	B	1958+	1.8	2.5	Primary	5,000
Hudson County						
Bayonne	B	1954	6.8	20.0	Primary	73,000
Hoboken	B	1958	13.1	20.0	Primary	70,000
Jersey City - East Side	B	1967+	31.2	46.6	Primary	160,000
- West Side	B	1967+	16.3	36.0	Primary	110,000
Joint Outlet (West New York)	B	1953	6.2	10.0	Primary	50,000
Kearny	B	1955	2.0	4.0	Primary	30,000
North Bergen - Woodcliff	B	1962	1.5	4.4	Primary	14,741
Middlesex County						
Carteret	B	1953	2.8	3.0	Primary	21,000
Madison Township Sewerage Authority - Laurence Harbor	A	1963+	0.5	1.0	Primary	8,000
Middlesex County Sewerage Authority	A	1965+	61.2	78.0	Primary	500,000
Perth Amboy	A	1934	6.6	10.0	Primary	41,000
Rahway Valley Sewerage Authority	B	1937	25.5	16.7	Primary	68,000
Sayreville - Melrose	A	1949	0.05	0.1	Primary	1,000
- Morgan	A	1951	0.15	0.3	Primary	2,000
South Amboy	A	1940	0.8	1.0	Primary	9,000
Woodbridge	B	1954	2.9	10.0	Primary	25,000
Monmouth County						
Atlantic Highlands	A	1928	0.4	0.6	Primary	4,100
Highlands	A	1928	0.4	1.2	Primary	3,500
Keansburg	A	1964+	1.6	2.5	Primary	6,900
Keyport	A	1962+	0.7	2.9	Primary	6,400
Union County						
Elizabeth Joint Meeting	B	1958+	59.9	100.00	Primary	465,000
Linden-Roselle	B	1952	12.0	12.5	Primary	66,000
Essex County						
**Passaic Valley	B	1937+	250.0	-	Primary	2,899,000
NEW YORK						
Nassau County						
Belgrave Sewer District	A	1965+	1.4	2.0	Secondary	15,000
Cedarhurst	A	1934+	0.8	1.0	Secondary	7,000
Freeport	A	1960+	4.0	4.0	Secondary	40,000

SEWAGE TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1968

Plant	Receiving Water Class	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
NEW YORK (continued)						
Nassau County (continued)						
Glen Cove - Morgan Island Estates	A	1948	-	-	Septic Tank	-
- Morris Avenue	A	1965+	3.1	4.0	Secondary	25,000
Great Neck District	A	1962+	1.9	4.0	Secondary	14,000
Great Neck Village	A	1948+	1.0	1.2	Secondary	9,000
Jones Beach	A	1951	Seasonal	1.0	Secondary	Seasonal
Lawrence	A	1966+	0.8	1.5	Secondary	6,000
Long Beach	A	1953+	5.8	9.6	Secondary	29,000
*Long Island Lighting Company (Glenwood Landing)	A	1929	-	-	3-Septic Tanks	Industrial
Nassau County Sewer District #1	A	1961	1.3	2.5	Secondary	9,000
Nassau County Sewer District #2	A	1962+	54.7	50.0	Secondary	600,000
Oyster Bay Sewer District	A	1965+	1.1	1.2	Secondary	6,000
Port Washington Sewer District	A	1952+	2.4	3.0	Secondary	25,000
*Quantitative Biology Laboratory	A	1965	-	0.008	Secondary	40
Roslyn	A	1950+	0.4	0.4	Secondary	3,000
West Long Beach Sewer District (Atlantic Beach)	A	1960+	0.7	1.5	Secondary	Seasonal
NEW YORK CITY						
Bronx County						
Hart-City Island	A	1942	1.0	1.5	Primary	5,000
Hunts Point	B	1965+	128.5	150.0	Secondary	770,000
Orchard Beach	A	1945+	Seasonal	0.1	Primary	Seasonal
Kings County (Brooklyn)						
Coney Island	A	1965+	75.0	110.0	Secondary	535,000
Newtown Creek	B	1967	98.4	310.0	Intermediate	2,500,000
Owls Head	B	1952	94.7	160.0	Intermediate	750,000
26th Ward	A	1951+	58.4	60.0	Secondary	385,000
*Preferred Oil Company	B	1948	-	-	Septic Tank	Industrial
New York County (Manhattan)						
Dyckman Street	A	1917	5.0	7.5	Screening	39,000
Wards Island	B	1948+	221.5	220.0	Secondary	1,470,000
Queens County						
Bowery Bay	B	1958+	110.6	120.0	Secondary	1,000,000
Jamaica	A	1965+	80.1	100.0	Secondary	415,000
Rockaway	A	1961+	16.7	30.0	Secondary	90,000
Tallmans Island	A	1964+	51.7	60.0	Secondary	251,000
Richmond County (Staten Island)						
*Daytop Village	A	-	-	-	Septic Tank	-
*Elmwood Homes	A	-	-	-	Extended Aeration	-
*Forest Hill Park	A	-	-	-	Extended Aeration	-
*Mount Loretto Home - Plant #1	A	-	-	-	Septic Tank	-
- Plant #2	A	-	-	-	Septic Tank	-
Oakwood Beach	A	1956	14.3	15.0	Secondary	85,000
*Port Authority	B	1965	-	-	Extended Aeration	40
Port Richmond	B	1953	8.5	10.0	Primary	60,000
*Public School #7	A	1965	-	-	Extended Aeration	2,200
*Public School #32	A	1965	-	-	Extended Aeration	1,200
*Richmond Memorial Hospital	A	1936	-	-	Septic Tank	-
*Saint Joseph's School	A	1965	-	-	Extended Aeration	910
Rockland County						
*Continental Can Company	A	1954	2.64	3.0	Primary	Industrial
Haverstraw	A	1940	0.5	1.0	Primary	6,000
*Jewish Convalescent Home - Grandview	A	-	-	-	Septic Tank	-
*Kay-Fries Chemicals, Inc.	A	1966	-	0.01	Neutralization	Seasonal
*Letchworth Village (Thiells)	A	1935+	0.4	0.8	Imhoff Tank	4,500
*New York State Rehabilitation Hospital (West Haverstraw)	A	1933	0.05	0.2	Imhoff Tank	300
Nyack	A	1940	1.1	1.0	Primary	6,000

SEWAGE TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1968

Plant	Receiving Water Class	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
NEW YORK (continued)						
Rockland County (continued)						
Orange & Rockland Utilities	A	-	-	-	Septic Tank	Industrial
Orangetown Sewer District #2	A	1967+	1.2	8.5	Secondary	6,100
Rockland County Sewerage Authority	A	1968		10.0	Secondary	
Palisades Interstate Park (Bear Mountain Plant)	A	1951	0.14	0.3	Secondary	Seasonal
**South Nyack	A	1941	0.3	0.6	Imhoff Tank	3,100
*Stony Point District #1	A	1963	-	0.15	Secondary	1,000
Upper Nyack	A	1953	0.07	0.1	Imhoff Tank	1,500
*U.S. Gypsum Company	A	1956	0.01	0.1	Imhoff Tank	Industrial
**West Haverstraw	A	1936	0.8	0.4	Imhoff Tank	5,500
Suffolk County						
Huntington Sewer District	A	1957+	1.4	2.0	Secondary	34,700
*Kings Park State Hospital (Smithtown)	A	1964+	1.0	2.0	Secondary	9,500
*Long Island Lighting Company (Port Jefferson)	A	-	-	-	Septic Tank	-
Northport	A	1949+	0.15	0.5	Imhoff Tank	6,000
Port Jefferson Sewer District	A	1963+	0.8	1.5	Primary	2,000
Westchester County						
*American Yacht Club (Rye)	A	-	Seasonal	-	2-Septic Tanks	Seasonal
Briarcliff Manor - River Road	A	1951+	-	-	Septic Tank	200
- Scarborough Dock	A	1926+	-	-	Septic Tank	1,500
Buchanan	A	1962	0.1	0.55	Secondary	-
*Columbia Island	A	-	-	-	Septic Tank	-
Croton-on-Hudson	A	1951+	0.7	0.5	Primary	7,000
*Harrison Island Shore Club	A	-	Seasonal	-	Septic Tank	Seasonal
*Hudson Shore Marina, Inc.	A	1960	Seasonal	-	2-Septic Tanks	Seasonal
Irvington	A	1950	0.8	0.5	Primary	5,500
Metropolitan Petroleum Corp.	A	1954	-	-	Septic Tank	-
*N.Y.C.R.R. Harmon Shop (Croton)	A	1941	0.12	0.7	Primary	Industrial
North Tarrytown	A	1940+	1.3	1.7	Primary	8,800
Ossining - Liberty Street	A	1939	0.5	0.5	Imhoff Tank	3,000
- Water Street	A	1940	2.3	2.0	Primary	16,000
Peekskill	A	1953	2.6	4.0	Primary	19,000
Port Chester	A	1965+	4.2	6.0	Primary	27,000
*Shell Union Oil Co. (Mount Vernon)	A	1949	-	-	Septic Tank	Industrial
*Shenerock Shore Club (Rye)	A	-	Seasonal	-	Septic Tank	Seasonal
*Sing Sing State Prison (Ossining)	A	1950+	0.3	0.6	Primary	2,000
Springvale	A	1959	0.08	0.1	Secondary	1,000
Tarrytown	A	1940+	1.0	1.5	Primary	11,100
Westchester County D.P.W.						
Blind Brook (Rye)	A	1963+	2.1	5.0	Primary	23,000
Mamaroneck	A	1965+	14.4	70.0	Primary	95,000
New Rochelle	A	1955+	10.6	15.0	Primary	75,000
Yonkers Joint Meeting	A	1960+	62.2	63.0	Primary	475,000
FEDERAL & MILITARY						
Camp Smith	A	-	-	-	Secondary	-
Earle Naval Ammunition	A	-	-	-	Secondary	-
FDR Veterans Administration Hospital	A	-	-	-	Primary	-
Floyd Bennett Field	A	-	-	-	Secondary	-
Fort Tilden	A	-	-	-	Primary	-
Liberty Island	B	-	-	-	Septic Tank	-
Military Ocean Terminal	B	-	-	-	Imhoff Tank	-

\+ Year of major additions of reconstruction

* Private, institutional and industrial sewage treatment plants

** Estimated flows

A P P E N D I X B

HIGHLIGHTS
of
INTERSTATE SANITATION COMMISSION
WATER POLLUTION ABATEMENT ACTIVITIES
(1936 - 1967)

HIGHLIGHTS
of
INTERSTATE SANITATION COMMISSION

WATER POLLUTION ABATEMENT ACTIVITIES

(1936 - 1967)

SUMMARY:

During this period the Commission has issued over 54 Commission orders with timetables for the abatement of water pollution. The Commission has gone to Court 12 times. All decisions were favorable to the Commission.

	1936	1967
Secondary Treatment Plants	2	44
Primary Treatment Plants	26	72
Less than Primary Treatment	18	22
	46	138

Flow Receiving Adequate Treatment (Secondary)	2,250,000 GPD	1,038,600,000 GPD
Total Flow Receiving Treatment	277,318,000 GPD	1,708,277,000 GPD

There are seven Interstate Water Pollution Control Agencies in the United States. The Interstate Sanitation Commission is the only one having the plant sampling program to insure that the plants are being operated to meet requirements of treatment.

1936 - Before 1936 there were but 46 municipally owned treatment plants. Approximately 4 percent of the total plants in service at that time were giving adequate treatment to the sewage being discharged. The total discharge for these 46 treatment plants was 277,318,000 gallons per day of which only 2,250,000 gallons per day was receiving adequate treatment, or less than one percent of the total treated. It is further estimated that 1,066,454,000 gallons per day were being discharged with-

out any form of treatment. The Tri-State Compact was approved in New York State. The Compact had already been approved in New Jersey and had received the consent of Congress in 1935. The Commission held its first meeting on February 17, 1936 to organize and elect officers.

1937 - This is the year that classification of the Interstate Sanitation District Waters was begun and the majority of the waters were classified. The Elizabeth Joint Meeting Plant was completed.

1938 - The classification of the Interstate Sanitation District waters was completed. The first order of the Commission was issued on October 4, 1938 for a Joint Pollution Abatement Project by Union City, Weehawken and West New York, New Jersey.

1939 - Twenty-six sewage treatment plants had been completed or were under construction since the establishment of the Commission three years ago.

1940 - Reports of the Water Pollution Survey sponsored by the Commission and carried on by the Works Project Administration were distributed this year. This study started in 1937.

1941 - The State of Connecticut joined the Commission. Due to World War II the construction of new sewage treatment facilities was halted.

1942 - Bowery Bay, Coney Island and Hart-City Island Treatment Plants were completed in New York City.

1943 - The war continued to influence abatement programs. New treatment works could not be built nor old ones modified. The Commission planned a report for a post-war works program. The Freeport and the Belgrave Sewer District Plants on Long Island and the Orangetown Sewer District No. 2 Plant and Jamaica Treatment Plant were completed.

1944 - The Commission urged the municipalities to prepare plans and specifications to be prepared to begin construction as soon as conditions would permit.

1945 - The Port Chester, New York Sewage Treatment Plant was completed and modifications to the Orchard Beach Plant in New York City were completed.

1946 - The inability to provide labor and materials to build sewage treatment plants stopped nearly all construction in the Interstate Sanitation District during this year.

1947 - Six hearings were held and thirteen orders issued.

1948 - The Commission entered its first two Court cases during this year; one against Carteret, New Jersey and the other against the municipalities of Union City, Weehawken and West New York, New Jersey. The Commission issued an order against New York City.

1949 - The Sing Sing Prison Plant in Ossining, New York and the Melrose Plant in Sayreville, New Jersey were completed. Orders were issued against 15 communities. Included were Bayonne, Jersey City, Elizabeth, Edgewater, Hoboken and Woodbridge in New Jersey; Peekskill, Long Beach and Croton-on-Hudson in New York.

1950 - The state of emergency declared by the President of the United States made it necessary for the Commission to re-evaluate its abatement program, since this would affect the availability of materials necessary for the construction of the treatment plants. Bridgeport, Connecticut completed modification and expansion of its East Side Plant. West Haven, Connecticut completed modification of its treatment plant.

1951 - Construction was limited to four plants due to Federal control of materials. The first phase of the Industrial Waste Inventory, which has been underway since 1949, was completed. Nassau County District Plant No. 2, West Long Beach and Jones Beach Treatment Plants on Long Island were completed as well as the West Side Plant in Bridgeport, Connecticut. The 26th Ward Plant Project which changed to secondary treatment was completed.

1952 - Treatment plants at Hunts Point, Owls Head, Rockaway and Port Washington, in New York State; Linden-Roselle, New Jersey and Fairfield, Connecticut, were all completed during this year. This represents a total capacity of 314,000,000 gallons per day, which these plants are capable of treating. This is the year the Commission in cooperation with the Corps. of Engineers started the Upper Harbor Survey to analyze the effects of sewage discharged through the Passaic Valley Sewage Treatment Plant.

1953 - The Carteret Plant in New Jersey and the Port Richmond Plant in Staten Island were completed this year.

1954 - Bayonne and Woodbridge, New Jersey Treatment Plants were completed this year.

1955 - New Rochelle and Freeport in New York and Kearny in New Jersey completed their treatment plants. The Commission completed studies on the control of cabin cruiser pollution. These studies were begun in 1953.

1956 - The Oakwood Beach Sewage Treatment Plant in New York City was completed. The Glen Cove Treatment Plant was completed on Long Island. A water pollution survey of the Arthur Kill was made.

1957 - This year the Commission issued a ten year Consent Order against New York City to spend not less than $22,000,000 a year and to meet a timetable for pollution abatement projects. In 1956, New York City was spending less than $2,000,000 annually for pollution abatement. By 1966, New York City was spending several times the $22,000,000 minimum and for that year it had a budget of $150,000,000. An Industrial Waste Survey and an intensive water pollution survey of the Arthur Kill Area were made. The two Jersey City Treatment Plants were completed.

1958 - A report on the Study of the Arthur Kill and a new method developed by the Commission Staff for analyzing data in tidal waters was issued by the Commission. The Middlesex County Sewerage Authority and Hoboken Treatment

Plants were completed. Additions to the Edgewater, New Jersey, Plant were made.

1959 - The report on the Upper New York Harbor Survey which was conducted in 1958 was issued and predictions concerning water quality could be made for the first time with some degree of accuracy as far ahead as 1965 and 1970. An intensive survey of the East River was conducted this year. New Haven completed the enlargement of its Boulevard Sewage Treatment Plant. Some interceptors in the service area of the Newtown Creek Pollution Control Project have been completed. Improvement of the Tallmans Island Treatment Plant has been completed. The Rahway Valley Sewerage Authority finished a new outfall to the Arthur Kill.

1960 - A report was made of the East River Survey which was conducted in 1959. Additions and modifications to the Freeport Plant were completed. The design capacity of the Nassau County Sewage District No. 2 was increased from 27,000,000 to 60,000,000 gallons per day. A new Gulf Pond Plant in Milford, Connecticut was completed. The new Orangetown Sewer District No. 2 Plant was completed and put into operation. Westport, Connecticut, and Yonkers, New York Treatment Plants were put into operation.

1961 - Additional interceptors were completed on the Newtown Creek Pollution Control Project. The Commission coordinated a Joint Model Study which was undertaken by the New Jersey State Department of Health, New York State Water Pollution Control Board and New York City Department of Health and made use of the U.S. Army Corps of Engineers Model in Vicksburg. The report was completed in 1963. The Commission commenced one Court Proceeding for the abatement of pollution, held two public hearings which were followed by the issuance of orders and participated as a Conferee in the Conference called by the U.S. Public Health Service pertaining to the Raritan Bay waters. Diversion of Fort Lee wastes to the Bergen County Sewage Treatment Plant was completed. Nassau County Sewer District Plant No. 1 was completed.

1962 - North Bergen completed its treatment plant which serves the portion of the Town that discharges into

the Hudson River. The results of intensive investigations and an analysis of data led to the determination of the assimilative capacity of the Arthur Kill and the issuance of a Report on the Treatment Requirements along the Arthur Kill. Rutgers made a Study for the Commission and found the cause of the bad taste in fish that had been caught in the Raritan and Lower Bays. The abatement of pollution in the Arthur Kill should eliminate this taste in fish.

1963 - Based on the Commission's Report of 1962, New Jersey issued orders to six municipal sewage treatment plants and 24 industries along the Arthur Kill to provide secondary treatment. These orders were issued for non-recreational water areas before it became popular to have secondary treatment in tidal waters. The Second Session of the Conference on Raritan Bay was held and it was agreed by all the Conferees that the States of New Jersey and New York and the Interstate Sanitation Commission had an active and effective program for control and abatement of pollution of Raritan Bay Waters. A continuous water quality monitor was installed in the Arthur Kill for the purpose of telemetering essential data to the Commission office. A study of Raritan Bay waterway was initiated by the Commission, to determine the extent of the dissolved oxygen deficiency problem. The extension to the Jamaica Sewage Treatment Plant and the Hunts Point Treatment Plant which was expanded to treat 150,000,000 gallons per day were completed. The Port Jefferson Treatment Plant was expanded to improve primary treatment as a result of the Commission's Court case against Port Jefferson.

1964 - Greenwich, Connecticut's new secondary plant which replaces four older plants was put into operation. Tallmans Island Treatment Plant construction which increases its design flow from 40,000,000 to 60,000,000 gallons per day was completed. The new Oyster Bay secondary treatment plant was completed. A continuous water quality monitor was installed on the lower East River for continuous analysis of data telemetered to the Commission office for observation and recording on a strip chart. At the urging of the Commission, the States agreed that chlorination be required in all plants in the Upper New York Harbor Area and start chlorinating on

May 15, 1967 which is the completion date of the Newtown Creek Treatment Plant.

1965 - The Commission has urged the States for several years to provide more than primary treatment. During the year, the States agreed that secondary treatment be required on all Commission waters. The States are obtaining timetables so that the plants may proceed to more advanced treatment of their wastes. In September of this year, the first Conference on the Hudson River was called. All the Conferees agreed to this policy of secondary treatment and agreed that there was an active program existing by the States of New York and New Jersey and the Interstate Sanitation Commission. New secondary units were placed in operation at the Belgrave Sewer District Plant on Long Island. The new Mamaroneck Plant was placed into service to replace an old screening plant. The Middlesex County Sewerage Authority increased its treatment capacity from 52,000,000 to 78,000,000 gallons per day. New additions were completed on the Hunts Point Pollution Control Project with an increased design capacity of 150 M.G.D. The Jamaica Bay Plant was expanded to 100 M.G.D. Port Chester diverted its flow to their new treatment plant.

1966 - The Commission completed its Court case against Port Chester which received a Court Order to remove industrial wastes within four months and provide the necessary treatment to meet the Commission standards within two years.

1967 - The Third Conference on Raritan Bay was called in June of this year and one of the conclusions was that considerable progress had been made toward abating this pollution problem. It was agreed by all the Conferees that a minimum of 80 percent removal of biochemical oxygen demand would be required at all times. The schedule proposed by New York and New Jersey was accepted by the Conferees for the abatement of the remaining pollution. The majority of the wastes will be treated during the period of 1967 to 1970 and the small amount of remaining wastes will be undergoing treatment before 1972. The Second Conference on the Hudson River was held in September of this year. The Conferees agreed that considerable progress had been made toward abatement of pollution problems and that the programs under way

will abate and control this pollution. It was agreed to provide secondary treatment and the timetable submitted by the States provides for all the abatement to be completed not later than 1972. The Newtown Creek Treatment Plant has been completed. It cost over $165,000,000 and was designed to treat over 300,000,000 gallons per day. Newtown Creek will treat approximately 140,000,000 gallons per day until the pumping station which will pump wastes from the lower part of Manhattan is completed in 1970. New Jersey has taken to Court some communities which did not meet the chlorination requirement as scheduled for the summer of 1967. It is expected that all treatment plants in the Upper Harbor and Lower Hudson Area will be chlorinating by the summer of 1968. The Commission in cooperation with the States in a little over thirty years has increased the waste water flow receiving secondary treatment from 2,250,000 gallons per day to the present 1,036,530,000 gallons per day. All wastes, approximately 2,098,277,000 gallons per day, should be receiving secondary treatment by 1972.