

South Essex Sewerage District



Annual Report 2020

WELCOME

South Essex Sewerage District

Board Members

Michael R. Parsons, P.E. | *Chairman*

Michael P. Collins, P.E. | *Director of Engineering, City of Beverly*

Stephen M. King Jr., P.E. | *Representative of the Town of Danvers*

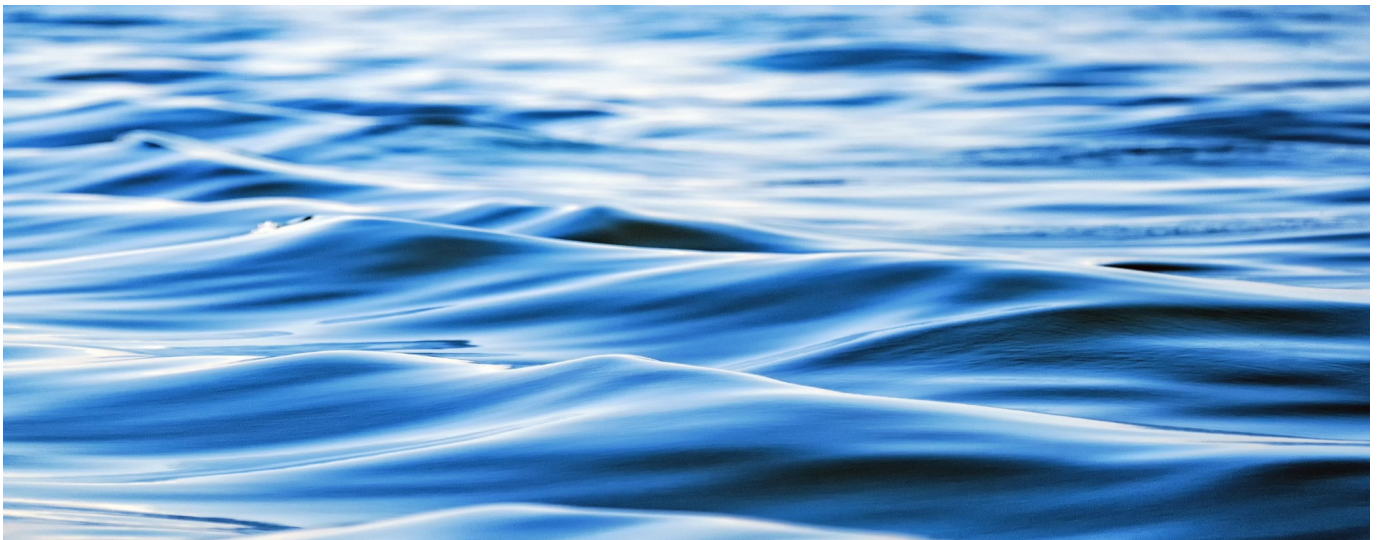
Amy S. McHugh | *Representative of the Town of Marblehead*

Robert J. Langley, P.E. | *Director of Engineering, City of Peabody*

David H. Knowlton, P.E. | *City Engineer, City of Salem*

“It is the mission of the South Essex Sewerage District to protect the public health of the District’s residents and enhance the quality of the region’s water resources by providing safe, efficient and reliable wastewater collection, conveyance, treatment and disposal.

This mission is accomplished by an organization of people dedicated to professionalism, stewardship and quality that anticipates and responds to the changing environmental and economic needs of the communities and other entities it serves.”

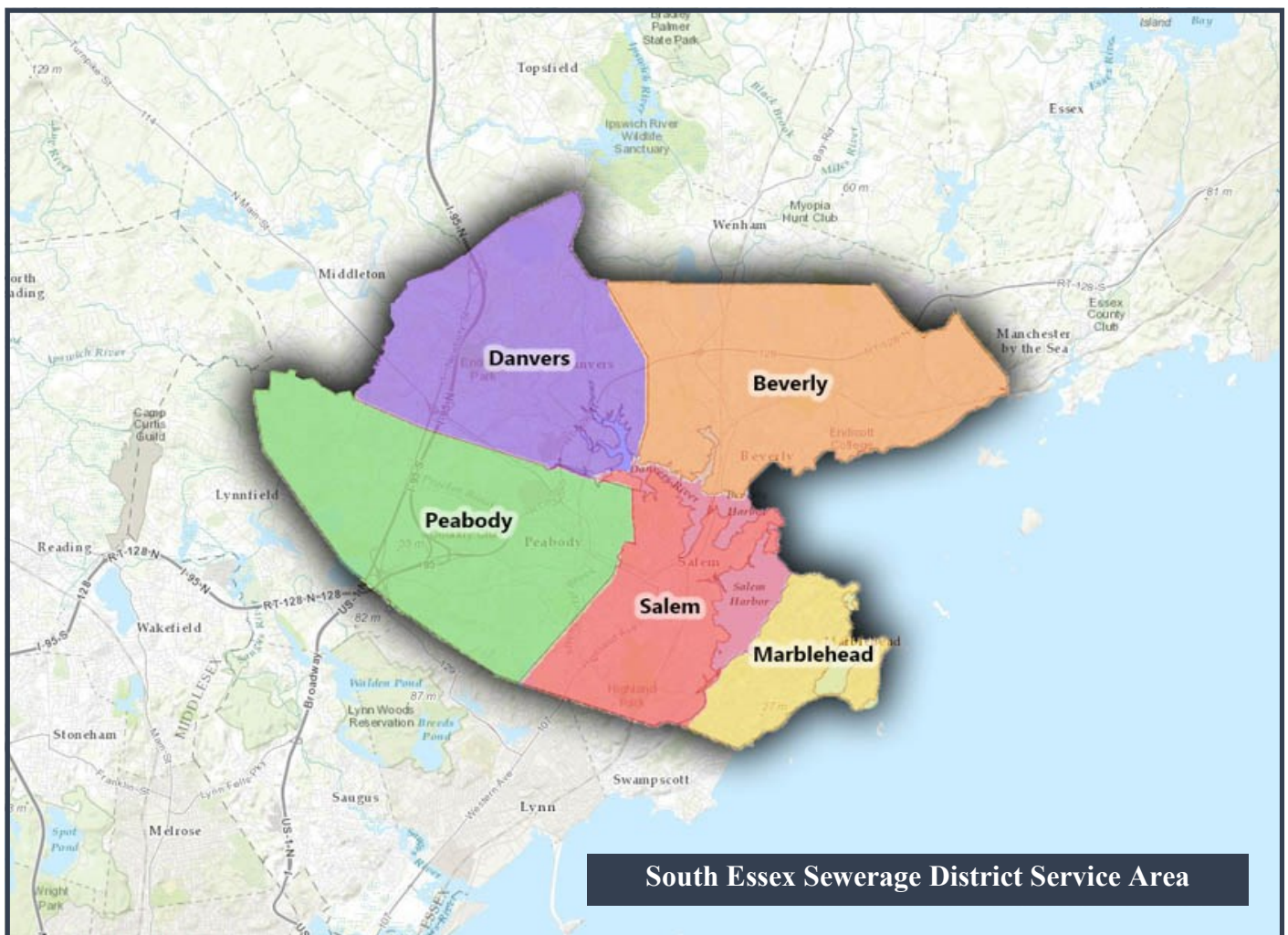


OUR HISTORY

SES D was established in 1925 to build, maintain, and operate a sewerage system for Beverly, Danvers, Peabody, Salem and the state and county institutions located in Danvers and Middleton, Massachusetts.

Since its establishment, services have expanded to include the town of Marblehead, as well as Gordon College in Wenham, and Ferncroft Village in Middleton.

The District is governed by a six-member Board representing our member communities who set policy and oversee the management of a staff of sixty-one full-time positions.



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A REPORT FROM THE EXECUTIVE DIRECTOR

The South Essex Sewerage District is pleased to present to you its Annual Report for 2020. This report presents the highlights of the District's accomplishments over the past calendar year and a summary of key metrics in an effort to provide information to our Member Communities and stakeholders.

This has been a difficult year for many of us due to the Covid 19 pandemic. Covid 19 has impacted District operations, requiring staff to pivot to new working arrangements and shift configurations during a spring wave and winter wave of community spread. Covid 19 has also put tremendous strain on the financial resources of many public entities, including the District and our Member Communities. Throughout it all, the District was able to maintain operations and permit compliance. The hard work of our staff should be commended for these efforts.

This year also marked a year of leadership transition, with David Michelsen, P.E. being appointed as the tenth South Essex Sewerage District Executive Director, taking the reins from Alan Taubert, Jr., P.E. who led the organization for more than seven years. Alan's passion and leadership are appreciated.

Other highlights of the year include a fantastic record of discharge permit compliance spearheaded by our Operations Division; a year of great productivity by the Maintenance Division including the implementation of a new Computerized Maintenance Management System; great strides in the Laboratory and Monitoring/Enforcement, including transition to a new test method for *Enterococci* which has led to more consistent results; and a busy year for Engineering who managed four different construction projects highlighted by the commissioning of the District's Combined Heat and Power Facility – energy savings which will be used to fund future capital upgrades. It is the ultimate Sustainability Project!

Looking forward to 2021, the District hopes that the Covid 19 vaccine will be widely distributed by early spring, allowing our operations to return to some sense of normalcy. The District hopes to complete three ongoing construction projects and launch two more including lining of a critical sub-aqueous pipeline in Danvers and rehabilitating the District's primary clarifiers.

Finally, the District anticipates kicking off our financial and capital planning for the next twenty years of District-wide improvements. The District's last significant plant-wide assessment and recapitalization was completed over 20 years ago, so this planning is critical to identify future treatment needs and an approach to address them.

All of us at the District will continue to work hard to serve our Member Communities, providing day to day wastewater treatment and positioning ourselves for a sustainable future.

David L. Michelsen, P.E.

ENGINEERING

The **Engineering Department** consists of three full-time positions including the District Engineer, Project Manager, and Health and Safety Leader. Engineering is responsible for technical support of other divisions and capital projects. They are currently directing four different capital projects, including an Infiltration and Inflow reduction project in Peabody as well as the three projects highlighted below.

Contract No. 11-3: Combined Heat and Power Facility

The Combined Heat and Power (CHP) unit at the District is operational as of late November 2019.

This 1,450 kilowatt generator burns natural gas. It currently supplies approximately 2/3 of the electrical power at the plant. We are also recovering heat from the CHP engine exhaust and using that heat to reduce our boiler usage. By recovering the heat, the CHP is 70% efficient, as compared to buying power off the grid which is approximately 30% efficient.

The CHP system is intended to operate 24 hours a day, all year long. The CHP unit saves the District more than **\$600,000 per year** in energy costs. This savings will be used to increase the District's annual capital improvement program and fund additional capital upgrade projects.

Contract No. 16-2: Beverly Bar Rack Replacement Project

A contract has been awarded to a General Contractor for the Beverly Bar Rack Replacement Project. The project focuses on the replacement of a 30-year-old bar rack at the Beverly Pump Station.

With this project, the District is reducing the bar spacing in an effort to remove more of those "flushable" wipes that cause ragging issues. Because this tighter bar spacing will result in an increased volume of screenings at the station, we are also installing the District's first **Wash Press** which will rinse and compact the screenings before they go into the dumpster.

This project also includes a new control panel for the pump station, as well as a replacement roof. The equipment will be operational in spring 2021.



Contract No. 15-2: Wastewater Treatment Plant Upgrades

A contract with Methuen Construction was executed in July 2020 for this project. The scope includes eighteen equipment improvement and replacement projects around the treatment plant.

Some of the significant upgrades include the replacement of the boilers in the Process Building, replacement of the High Head Effluent Pump VFDs, replacement of the air conditioning unit for the Effluent Pump Station, replacement and painting of plant water and sprinkler piping in the Primary Pump Room and tunnels, and replacement of the hydrogen peroxide bulk storage tanks.

This project will improve our plant's overall reliability and condition.

LABORATORY AND MONITORING/ENFORCEMENT

The **Laboratory and Monitoring/Enforcement Department** consists of six full-time positions: Supervisor, Industrial Pre-Treatment Inspector, Pre-Treatment Technician, Chief Lab Technician, Senior Lab Analyst, and Lab Technician.

Laboratory personnel collect samples throughout the plant and receive samples from *Operations* and *Monitoring/Enforcement*. Analyzed results are used to control the treatment process and to verify the plant is performing to meet our NPDES discharge permit and assure our discharge does not negatively impact local water quality.

Dental Compliance Report



On June 14, 2017, the USEPA promulgated pretreatment standards (40 CFR 441) to reduce discharges of mercury from dental offices into municipal sewage treatment plants known as Publicly Owned Treatment Works (POTWs).

As the local Control Authority, the District contacted over 130 dental offices in our service area to ensure they are in compliance by no later than the due date of October 12, 2020. As of this publication, **100%** of all offices are in compliance with submitting this report. Evaluation of District dental offices continues to ensure all entities remain compliant.

Permitted Industries

The District permits twenty-six Industrial users who are beholden to our pretreatment guidelines.

Personnel in the *Monitoring/Enforcement* Division inspect and enforce restrictions on all wastewater dischargers in our service area. In addition to permitted industries, this includes light manufacturing, commercial, food processing, and other facilities.



Testing Performed in 2020

<u>Description</u>	<u>Estimated # of Tests</u>
1. pH	4,000
2. Settleable Solids <i>(Imhoff Cone – Comb. Inf., Pri. Eff., Sec. Eff.)</i>	1,100
3. Settled Sludge Volume <i>(Settleometer – Aeration Tanks)</i>	1,200
4. Dissolved Oxygen	1,300
5. Temperature	400
6. Chlorine Residual <i>(Head, End, Dechlor)</i>	2,500
7. Bacteria <i>(Fecal Coliform, Enterococci)</i>	3,700
8. Total Solids <i>(Process grabs)</i>	1,400
9. Total Suspended Solids <i>(Process grabs)</i>	2,500
10. Total Suspended Solids <i>(Community, Process & Industry composites)</i>	2,500
11. Biochemical Oxygen Demand <i>(Community, Process & Industry composites)</i>	2,200

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OPERATIONS

Permit Driven, Quality Delivered

The District's effluent discharge is governed by a permit issued by the EPA under the Clean Water Act (CWA) known as a National Pollutant Discharge Elimination System permit (NPDES).

The permit contains limits on quantity and quality of the water the District can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not impair water quality, safety of plant workers, or people's health. It essentially provides a standard for how the District should operate to maintain a safe discharge for rate payers and receiving waters.

The **Operations Division** consists of twenty-four full-time positions:

- Superintendent of Operations
- Assistant Superintendent of Operations
- (6) Chief Operators
- (12) Operators
- (4) Facilities Attendants

The staff ensure 24-hour, 365 days of safe operation of our secure wastewater treatment facility.

Plant Performance Report - 2020

Parameter

Influent TSS	230 mg/l	43,678 lbs.	Average Per Day
Influent BOD	166 mg/l	31,804 lbs.	Average Per Day
Effluent TSS	13 mg/l	2,703 lbs.	Average Per Day
Effluent BOD	10 mg/l	2,050 lbs.	Average Per Day
Effluent Flow	24.5 Million Gallons Per Day		8.966 Billion Gallons in 2020
Fecal Coliform	14 CFU / 100 ml		Average Per Day
Enterococci	17 Colonies / 100 ml		Average Per Day
Chlorine Residual	0.03 mg/l		Average Per Day
Sludge Daily	84.73 Tons		Average Per Day
Sludge Total	31,006 Tons in 2020		

MAINTENANCE

The District upgraded its Computerized Maintenance Management System to a new software called **Lucity** which went online in December of 2019. In the past year, the following was accomplished:

- Trained District employees on how to use the software using assigned Android tablets.
- Issued over 1,500 work orders generated from requests and preventative maintenance schedules.
- Created over 500 preventative maintenance schedules.
- Integrated purchasing and created over 150 purchase orders.
- Managed over 3,500 unique parts tracked from warehouse location through installation.

Many *Standard Operating Procedures* were also developed as the District continues to build onto this database to streamline critical workflow.

The **Maintenance Division** consists of twenty-two full-time positions:

- Superintendent of Maintenance
- Asst. Superintendent of Maintenance
- Scheduler, Planner, CMMS Administrator
- Electrical Foreman
- Electrician
- Instrumentation Specialist
- Instrument Repair Technician
- Inventory Control Clerk
- Facilities Foreman
- HVAC Mechanical Technician
- Master Mechanic
- (3) Lead Mechanics
- (3) Mechanics
- Mechanic/Machinist
- Mechanic/Equipment Operator
- Mechanic Helper
- Maintenance Equipment Operator
- Maintenance Helper

Notable Accomplishments

- Retrieved sheared shaft and repaired 30 hp Primary Mixer.
- Fabricated and installed wear strips for first of seven secondary clarifiers. Self-fabrication of wear strips saved the District \$45,000!
- Purchased and installed four new 10 hp Thickened Sludge Pumps with inlet hoppers.
- Repaired/rebuilt the Danvers Manual Bar Rack inlet gate, which saved the District \$21,000 compared to replacement!
- Completed the overhaul of the 200 hp Beverly Pump Station No. 1 Sewage Pump.



ADMINISTRATION AND FINANCE

The Division consists of six full-time positions:

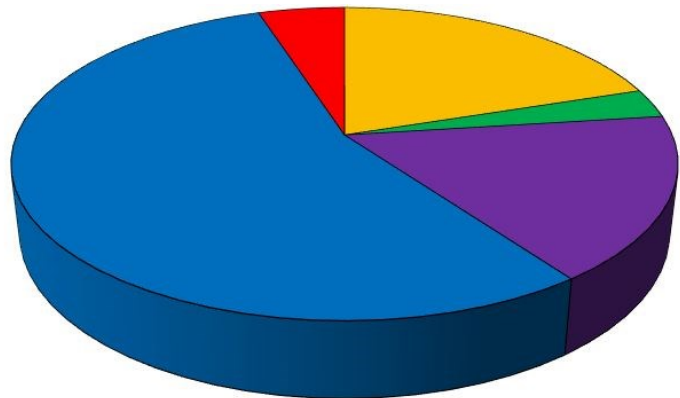
- Executive Director
- Manager of Administration and Finance (District Treasurer)
- Executive Secretary (District Clerk)
- Accounts Payable/Payroll/Personnel Clerk
- Senior Accounting Clerk (Assistant District Treasurer)
- Administrative Assistant

The District's **Administration and Finance Division** is responsible for the administration, finance and overall operational direction of the District. The division formulates and administers policies and procedures concerning all District functions. It also prepares the annual budget and member entity assessments based on their portion of flows and loads to the District's treatment plant. The District Board is responsible for reviewing and approving each fiscal year budget.

A complete review of the District's fiscal year financial performance may be found in the District's Audited Financial Statements and Treasurer's reports. A few FY 2020 highlights include:

- Assets exceeded liabilities by \$177 million representing an increase in net position of \$1.9 million from FY 2019. The largest portion of the net position, \$175.9 million, reflects the District's investment in capital assets (excluding debt), such as the treatment facilities on Fort Avenue.
- FY 2020 budgeted member assessments totaled \$25,155,728 representing an increase of 1.58% from the FY 2019 budgeted amount of \$24,763,314.
- The Operations Division consumes the majority of the fiscal operating budget as they are responsible for power, fuel, chemical and residuals disposal expenditures.

- Administration & Finance* 20%
- Capital Expenses & Planning 3%
- Maintenance 17%
- Operations 55%
- Technical Support 5%



* Administration & Finance includes insurance, pensions & other employee benefits.

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