UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
ONE CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES PERMIT NO: **MA0100501**

NAME AND ADDRESS OF APPLICANT:

South Essex Sewerage District
P.O. Box 989
50 Fort Avenue
Salem, MA 01970

The municipalities of Beverly, Danvers, Marblehead, Middleton, Peabody, and Salem, are co-permittees for specific activities required by the permit. See Sections VI (SESD and all co-permittees) and VII (Marblehead only) of this fact sheet and Sections I.C., I.D.,I.F. and I.G of the draft permit. The responsible parties are:

City of Beverly
c/o City Engineer
Beverly City Hall
191 Cabot Street
Beverly, MA 01915

Town of Danvers
c/o Town Engineer
Public Works Engineering Division
1 Burroughs Street
Danvers, MA 01923

Town of Marblehead
c/o Superintendent
Water/Sewer Department
P.O. Box 1108
Marblehead, MA 01945

Town of Middleton
c/o Superintendent of
Public Works
195 North Main Street
Middleton, MA 01949

City of Peabody
c/o Director of Public Services
50 Farm Avenue
Peabody, MA 01960

City of Salem
c/o City Engineer
120 Washington Street
4th Floor
Salem, MA 01970

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

South Essex Sewerage District
50 Fort Avenue
Salem, MA 01970

RECEIVING WATERS: **Salem Sound (North Coastal Watershed, Segment MA 93-25**)

CLASSIFICATION: **Class SA**

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I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency for the re-issuance of its National Pollutant Discharge Elimination System (NPDES) permit to discharge into the designated receiving water. The current permit became effective on October 10, 2001; 30 days after EPA withdrew four contested permit conditions. It expired on October 10, 2005, four years from the effective date. This draft permit, after it becomes effective, will expire five (5) years from the effective date.

II. TYPE OF FACILITY AND DISCHARGE LOCATION

The facility is a secondary wastewater treatment plant with an average daily design flow of 29.71 million gallon per day (mgd)[1]. The facility discharges via a multiport diffuser approximately 1.4 miles offshore into Salem Sound (See Figure 1). According to the application, the collection system is 100% separate sanitary sewer. The South Essex Sewer District is a regional collection system which serves five municipalities with a total population of 174,931.

The facility's discharge outfalls are listed below:

Outfall	Description of Discharge	Receiving Water
001	Treated Effluent	Salem Sound

III. DESCRIPTION OF DISCHARGE

Quantitative descriptions of the discharge in terms of significant effluent parameters, based on discharge monitoring reports (DMRs) submitted for September 2005 through December 2007, and the April 2005 application, are shown in Tables 1 and 2 of this fact sheet, respectively.

IV. LIMITATIONS AND CONDITIONS

The effluent limitations and monitoring requirements may be found in the draft NPDES permit.

V. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

A. PROCESS DESCRIPTION

The South Essex Sewerage District Wastewater Treatment Facility (SESD) was originally built as a primary treatment facility in 1978. The facility was upgraded in 1998 to provide secondary treatment. The upgraded facility has an average daily design flow of 29.71 mgd with year-round chlorination and dechlorination and discharges to the Salem Sound (Figure 1).

The District is a regional collection system which serves six municipalities each responsible for their own infrastructure. Additionally, the treatment facility receives flows from several county and state facilities (Essex County Industrial Farm (new jail), Essex County Agricultural and Technical Institute and the Commonwealth of Massachusetts Department of Public Health (Danvers State Hospital)). In addition, there are 26 significant industrial users, 18 of which are subject to categorical limitations. The facility also accepts septage from all of the district communities.

The following is a brief description of the treatment process (See Figure 2); raw wastewater enters the aerated grit chambers and then flows into the primary settling tanks, where floating and settleable solids are removed. The primary effluent is then distributed to the oxygen reactors, and then flows to the

[1] Camp Dresser & McKee, Inc., 1992, Final Environmental Impact Report and Final Facilities Plan, p. 6-138.

stacked secondary clarifiers. The secondary effluent is chlorinated, then dechlorinated, and the final effluent is then pumped and discharged via the multiport diffuser into Salem Sound.

Sludge is thickened and dewatered on-site and then trucked off-site for disposal by an outside contractor.

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Overview of Federal and State Regulations

Under Section 301(b)(1)(B) of the Clean Water Act ("CWA"), publicly owned treatment works ("POTWs") must have achieved effluent limitations based upon Secondary Treatment by July 1, 1977. The secondary treatment requirements are set forth at 40 C.F.R. Part 133.102. In addition, Section 301(b)(1)(C) of the CWA requires that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water.

Pursuant to 40 C.F.R. § 122.44 (d), permittees must achieve water quality standards established pursuant to Section 303 of the Clean Water Act (CWA), including state narrative criteria for water quality. Additionally, under 40 C.F.R. § 122.44 (d)(1)(i), "Limitations must control all pollutants or pollutant parameters which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." When determining whether a discharge causes, or has the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numeric criterion, the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, and where appropriate, consider the dilution of the effluent in the receiving water.

2. Water Quality Standards; Designated Use

Effluent from the SESD WWTF is discharged to Salem Sound; segment MA93-25, which is part of Massachusetts Bay and classified as a Class SA water[2] (See Figure 3). Class SA waters are designated by the Commonwealth of Massachusetts as "excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value (314 CMR 4.05(4)(a))."

Section 303(d) of the Federal Clean Water Act (CWA) requires states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and, as such, require the development of total maximum daily loads (TMDL). Salem Sound is listed on the Massachusetts 2006 Integrated List of Waters (303d) as impaired and requiring the development of a TMDL[2]. The listed impairment for this segment is pathogens. According to MassDEP, the primary cause of the

[2] Massachusetts Department of Environmental Protection, Division of Watershed Management, August 2007, Massachusetts Year 2006 Integrated List of Waters, Final Listing of the Condition of Massachusetts' Waters Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, p. 121.

impairment is wet weather discharges from separate storm sewers but MassDEP also suspects marina/boating pumpout releases and on-vessel discharges[3].

Available Dilution
When appropriate, water quality based limits are established with the use of a dilution factor. The previous permit used dilution factors (chronic 32:1 and acute 26:1) which were estimated in the SESD Draft Environmental Impact Report (SESD DEIR)[4] using the ULINE model.

Initial dilution processes occur on the order of minutes, and therefore, initial dilution calculations are often performed using hourly flow rates. The flow rates analyzed in the SESD DEIR were determined from measured flows (January 1988-December 1989) which were then projected as future flows using a correction factor of 1.05 (1988-1989 annual average flow (26.6 mgd)/future annual average flow (27.9 mgd)). It is noted, however, that the final design was 29.7 not 27.9, which is a 6.4% increase over the modeled design flow.

A second modeling effort was conducted in 2001 by Applied Science Associates, Inc, under a contract with Massachusetts Coastal Zone Management. The dilutions were calculated using the CORMIX 2 model, which is specific to submerged multiport diffusers, and using the same flows modeled in 1991, however, the results were more conservative. The chronic dilution was 24:1 and the acute dilution was 16:1.

Given that the final design flow (29.7 mgd) is slightly greater than that modeled (27.9 mgd) in 1991, EPA has adopted the more conservative dilution factors into this permit. It is also noted that the CORMIX 2 model is specific to modeling submerged multiport diffusers and therefore, the results are thought to be more representative.

Flow - The draft permit includes a flow limit to protect the dilution factor and to assure that flows do not exceed design and compromise treatment quality. The flow limit is based on the average daily design flow of the treatment plant, which is 29.71 mgd. Flow is to be measured continuously. The permittee shall report the annual average monthly flow using the annual rolling average method (See Permit Footnote 1). The monthly average and maximum daily flow shall also be reported.

OUTFALL 001 - CONVENTIONAL POLLUTANTS

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) - The draft permit proposes the same $CBOD_5$ concentration limits that are in the current permit, which are based on the secondary treatment requirements set forth at 40 CFR 133.102 (a)(1), (2), (4) and 40 CFR 122.45 (f). The secondary treatment limitations are a monthly average $CBOD_5$ concentration of 25 mg/l and a weekly average concentration of 40 mg/l. The draft permit requires the permittee to report the maximum daily $CBOD_5$ value each month, but does not establish an effluent limit. The monitoring frequency continues to be once per day.

A review of DMR data submitted over the last 28 months shows that there have not been any permit violations for $CBOD_5$. Based on the DMR data, the average values for $CBOD_5$ monthly average, weekly average and maximum daily were 10.61 mg/l (range 6.0-16.0 mg/l; n=28), 13.36 mg/l (6.0-25.0

[3] Massachusetts Department of Environmental Protection, Division of Watershed Management, March 2007, North Shore Coastal Watersheds, 2002 Water Quality Assessment Report, p. 118

[4] Camp, Dresser & McKee, Inc., September 1991, SESD Draft Environmental Impact Report, Phase II Facilities Plan for Wastewater Treatment and Disposal, p. 6-84

mg/l; n=28) and 20.04 (8.0-60.0 mg/l; n=28), respectively. These values are below the permit limits of 25 mg/l average monthly and 40 mg/l average weekly.

Pursuant to 40 CFR §122.45(f) the permit also includes mass limits for $CBOD_5$. The average monthly and average weekly allowable mass-based (load) limitations for $CBOD_5$ are based on the concentration limits described above and the POTW's average daily design flow of 29.71 MGD and the appropriate constituent concentration for the respective time period being limited.

$CBOD_5$ Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly, average weekly and maximum daily $CBOD_5$ are based on the following equation:

L = C x DF x 8.34 where:
L = Maximum allowable load in lbs/day.
C = Maximum allowable effluent concentration for reporting period in mg/l.
Reporting periods are average monthly and weekly and daily maximum.
DF = Annual average design flow of facility in MGD.
8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

(Concentration limit) [25] X 8.34 (Constant) X 29.71 (Design flow) = 6,194 lb/day
(Concentration limit) [40] X 8.34 (Constant) X 29.71 (Design flow) = 9,911 lb/day

Total Suspended Solids (TSS) - The draft permit proposes the same TSS limitations as in the existing permit. The average monthly and average weekly limits are based on the secondary treatment requirements set forth at 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f) and are a monthly average TSS concentration of 30 mg/l, and a weekly average concentration of 45 mg/l. The draft permit requires the permittee to report the maximum TSS value each month, but does not establish a maximum daily effluent limit. The monitoring frequency continues to be once per day.

A review of DMR data submitted over the last 28 months shows that there have not been any permit violations for TSS. Based on the DMR data, the average values for TSS monthly average, weekly average and maximum daily were 13.79 mg/l (range 6.0-23.0 mg/l; n=28), 17.50 mg/l (7.0-29.0 mg/l; n=28) and 30.79 (9.0-81.0 mg/l; n=28), respectively. These values are below the permit limits of 30 mg/l average monthly and 45 mg/l average weekly.

Pursuant to 40 CFR §122.45(f) the permit also includes mass limits for TSS. The average monthly and average weekly allowable mass-based (load) limitations for TSS are based on the concentration limits described above and the POTW's average daily design flow of 29.71 MGD and the appropriate constituent concentration for the respective time period being limited.

TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly TSS are based on the following equation:

L = C x DF x 8.34 where:

L = Maximum allowable load in lbs/day.
C = Maximum allowable effluent concentration for reporting period in mg/l.

Reporting periods are average monthly and weekly and daily maximum.
DF = Design flow of facility in MGD.
8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

(Concentration limit) [30] X 8.34 (Constant) X 29.71 (design flow) = 7,433 lb/day
(Concentration limit) [45] X 8.34 (Constant) X 29.71 (design flow) = 11,150 lb/day

Eighty-Five Percent (85%) $CBOD_5$ and TSS Removal Requirement - The provisions of 40 CFR §§133.102(a)(3), (4) and (b)(3) requires that the 30 day average percent removal for $CBOD_5$ and TSS be not less than 85%. The previous permit required that the 85% removal requirement only be met in dry weather.

For separate sanitary sewers, adjustments of the percent removal requirements can only be made if it is demonstrated that the limits can not be met due to less concentrated influent, and that the less concentrated influent is not the result of excessive I/I. Because such a demonstration has not been made the 85% removal limit in the draft permit applies at all times.

pH - The draft permit includes pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 C.F.R. §133.102(c). The pH of the effluent shall not be less than 6.5 or greater than 8.5 standard units at any time.

A review of DMR data submitted over the last 28 months shows that there have not been any permit violations for pH. Based on the DMR data, the pH values have ranged from 6.5 to 7.5 standard units.

Oil and Grease – The current permit includes an effluent limit of 15 mg/l for oil and grease. This value meets the narrative "free from oil and grease and petrochemicals" in the SA criteria. Since the current permit became effective on October 10, 2001, the maximum daily value for oil and grease has not exceeded 9 mg/l and has an average maximum daily value of 7.83 mg/l (n=70). EPA has determined that there is no reasonable potential and has removed the requirement from the permit.

Fecal Coliform Bacteria - The existing permit includes effluent limitations for fecal coliform bacteria which are in accordance with the Massachusetts Surface Water Quality Standards (SWQS) at 314 CMR 4.05 (4)(b) for Class SB waters. However, the discharge is to Salem Sound which is part of Massachusetts Bay and listed as a Class SA water body[5] (See Figure 1 and 3).

In Class SA waters designated for shellfishing, fecal coliform bacteria shall not exceed a geometric mean of 14 organisms per 100 ml, nor shall more than 10% of the samples exceed 28 organisms per 100 ml.
Colony forming units (cfu) or most probable number (MPN) units are determined by the method of analysis used for bacteria analysis. Both units are acceptable.

Between September 2005 and December 2007, there were no violations of the existing fecal coliform bacteria effluent limitations of average monthly of 200 cfu/100 ml and a maximum daily of 400 cfu/100 ml. Based on Discharge Monitoring Reports (DMRs) submitted by the permittee, the average values for

[5] Massachusetts Department of Environmental Protection, Division of Watershed Management, March 2007, North Shore Coastal Watersheds, 2002 Water Quality Assessment Report, p. 116

fecal coliform bacteria were a monthly average of 16 cfu/100 ml and an average maximum daily of 101 cfu/100 ml.

Enterococci – The Commonwealth of Massachusetts has adopted revisions to the Massachusetts SWQS which also use the indicator bacteria, enterococci, for recreational waters. The standard for Class SA bathing beach waters is that no single enterococci sample taken during the bathing season shall exceed 104 colonies per 100 ml, and the geometric mean of the five most recent samples taken within the same bathing season shall not exceed a geometric mean of 35 colonies per 100 ml.

Since this is a new requirement, the draft permit allows the permittee to monitor enterococci once per day for the first year of the permit without an effluent limit. After one year, the effluent limitations apply as follows: the discharge shall not exceed 104 colonies per 100 ml and the geometric mean of the five most recent samples taken within the bathing season shall not exceed a geometric mean of 35 colonies per 100 ml.

The permittee must sample for enterococci, concurrently with samples for fecal coliform bacteria and total residual chlorine.

OUTFALL 001 - NON-CONVENTIONAL POLLUTANTS

Total Residual Chlorine - Chlorine is a toxic chemical. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. DMRs show chlorine residual levels below the minimum detection level for the past 28 months. The draft permit includes Total Residual Chlorine (TRC) limitations based on state water quality standards [Title 314 CMR 4.05(5)(e)].

The acute and chronic water quality criteria for chlorine defined in the 2002 EPA National Recommended Water Quality Criteria for saltwater are 13 ug/l and 7.5 ug/l, respectively. Given the dilution factors of 16 and 24, respectively, the total residual chlorine limits have been calculated as 0.208 mg/l maximum daily and 0.18 mg/l average monthly. The sampling frequency has been reduced to twice (2) per day. Samples must be collected concurrently with the samples for Fecal Coliform Bacteria and Enterococci.

A review of DMR data submitted over the last 28 months shows that there have been two (2) permit violations for TRC. A maximum daily value of 0.6 mg/l was reported in May 2007 and 0.48 mg/l was reported in January 2007.

Total Residual Chlorine Limitations:
(acute criteria * dilution factor) = Acute (Maximum Daily)
(13 ug/l x 16)= 208 ug/l = 0.208 mg/l

(chronic criteria * dilution factor) = Chronic (Monthly Average)
(7.5 ug/l x 24) = 180 ug/l = 0.180 mg/l

Nitrogen – The current permit requires the permittee to monitor for ammonia nitrogen, total kjeldahl nitrogen and total nitrate. These requirements were established due to concerns of potential extensive nutrients in the effluent which could cause effects to marine life. Given that essential fish habitat has been designated in the vicinity of the discharge, EPA has maintained these monitoring requirements in the draft permit.

Metals - Certain metals like copper, lead, nickel, silver and zinc can be toxic to aquatic life. EPA has evaluated the reasonable potential for the discharge of these metals to cause or contribute to violations of water quality standards. Based on this evaluation, EPA has determined that there is no reasonable potential and no need to limit or monitor these metals.

The calculation of reasonable potential for copper, lead, nickel, silver and zinc was done by calculating the allowable acute and chronic discharge concentration for each metal and comparing those values to the concentrations measured in the discharge (See Table 2). If the actual discharge concentration exceeds the allowable discharge concentration, there is reasonable potential and the permit must contain an effluent limit for that pollutant. The effluent metals concentrations were taken from the permittee's 2005 application.

Allowable discharge concentrations were calculated using the following equation:

C = WQC * DF

Where C = allowable effluent concentration
WQC = water quality criteria for the metal, expressed as total recoverable metal
DF = dilution factor

As discussed earlier, the dilution factors calculated in 2001 by Massachusetts CZM's contractor are a chronic dilution of 24.1:1 and an acute dilution of 16:1.

The water quality criteria were obtained from National Recommended Water Quality Criteria 2002. Since the discharge is to a marine water, the criteria for salt water were used. Most metals have two criteria, one for acute exposure and the other for chronic exposure. As of the 2002 criteria, only an acute criteria has been established for silver. Acute criteria are generally used to calculate maximum daily limits and chronic criteria are used to calculate monthly average limits.

In all cases, the calculated allowable effluent concentration was far greater than the reported effluent concentration; therefore, reasonable potential does not exist.

OUTFALL 001 - WHOLE EFFLUENT TOXICITY (WET)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

National studies conducted by the EPA have demonstrated that domestic sources contribute toxic constituents to POTWs. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. Based on the potential for toxicity from domestic and industrial sources, the state narrative water quality criterion, and in accordance with EPA national and regional policy and 40 C.F.R. § 122.44(d), the draft permit includes a whole effluent acute toxicity limitation (LC50 =100%) and requires testing and report of the chronic endpoint. (See also "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants", 49 Fed. Reg. 9016 March 9, 1984, and EPA's "Technical Support Document for Water Quality-Based Toxics Control", September, 1991.)

The current permit requires the permittee to conduct quarterly (4/year) acute toxicity tests. EPA Region 1 policy requires marine discharges with an initial dilution between 20:1 and 10:1 to conduct quarterly acute toxicity tests on two species *Mysidopsis bahia* (Mysid shrimp) *and Menidia beryllina* (Inland silverside) and quarterly chronic toxicity testing on one species *Arbacia* (sea urchin).

Previous acute toxicity testing using Mysid shrimp and Inland silverside found Inland silverside to be the more sensitive species. Since the current permit was issued there have been five (5) violations of the LC50≥100% for Inland silverside and two (2) violations of the LC50≥100% for Mysid shrimp. The violations for Mysid shrimp occurred in 2004 and were coincident with violations for Inland silverside. The draft permit proposes to reduce the number of test species for acute toxicity testing to *Menidia beryllina*, only.

The draft permit also includes a new chronic toxicity testing requirement, consistent with Region 1 policy for permittees with initial dilutions between 20:1 and 10:1. This requirement is a direct result of the revised initial dilution.

Pursuant to MassDEP and EPA Region I policy, chronic toxicity testing is required four times per year, The permittee is required to report the chronic endpoint.

According to the WET reports, the permittee has switched to the use of an alternative dilution water. EPA has no record of a request or approval for the use of alternative dilution water. The current permit requires the permittee to submit a written request and supporting documentation for use of an alternative dilution water (See Attachment A of the current permit). The permittee was not to substitute an alternative dilution water until after receiving written approval from EPA.

Furthermore, the permittee has not provided a site water control data as required. The draft permit requires the permittee to return to the use of the site (receiving) water as a diluent. If future WET results document that the receiving water is toxic or unreliable, the permittee must follow the protocol in **Attachment C of the permit** for switching to an alternative dilution water.

If alternative dilution water is warranted, a site water control sample must be run in addition to an alternative dilution water control sample. Chemical data of the receiving water and dilution water samples must be included in the WET report. EPA will reject WET test reports that do not follow Permit requirements, applicable protocols , and meet all minimum criteria for acceptability and variability of test results, and will require tests be repeated until valid results are obtained. Results, valid or otherwise, must be submitted by the date specified in Part I of the Permit, even if the test must be repeated.

The tests must be performed in accordance with the test procedures and protocols specified in **Permit Attachment A, B, and C**. The tests will be conducted four times a year, during the second week of the following months, February, April, June and August.

The permit shall be modified or alternatively revoked and reissued , to incorporate additional toxicity testing requirements, including chemical specific limits, if the results of the toxicity tests indicate the discharge causes an exceedance of any state water quality criterion. Results from these toxicity tests are considered “New Information” and the permit may be modified pursuant to 40 CFR 122.62(a)(2).

VI. INFLOW/INFILTRATION REQUIREMENTS

Infiltration is groundwater that enters the collection system though physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems.

Significant I/I in a collection system may displace sanitary flow, reducing the capacity and the efficiency of the treatment works and may cause bypasses to secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems, and combined sewer overflows in combined systems.

The draft permit includes requirements for the permittee and the co-permittees to control infiltration and inflow (I/I) into the collection system it owns and operates. The permittee and co-permittees shall each develop an I/I removal program commensurate with the severity of the I/I in their portion of the collection system. In sections of the collection system that have minimal I/I, the control program will logically be scaled down. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems.

The permit standard conditions for 'Proper Operation and Maintenance' are found at 40 CFR §122.41(e). These conditions require proper operation and maintenance of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, the co-permittees have a 'duty to mitigate' as stated in 40 CFR §122.41 (d). This requires the co-permittees to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has a reasonable likelihood of adversely affecting human health or the environment. EPA and MassDEP maintain that an I/I removal program is an integral component of ensuring permit compliance under both of these provisions.

VII. SANITARY SEWER OVERFLOWS

The Town of Marblehead is a permittee under NPDES permit MA0100374. The permit addresses the use of an emergency overflow from the Sargent Road Pumping Station. On April 11, 2005, EPA sent a letter to the Town of Marblehead informing the Town of EPA's intention to terminate the permit as the permit does not authorize the discharge but only establishes the conditions under which the EPA has authority to enforce in the event of bypass. The Town of Marblehead responded and requested that the individual permit be reissued.

However, given that the Town of Marblehead is named as a co-permittee in the draft permit and the point source addressed in MA0100374 is a part of the collection system conveying flow to the South Essex Sewerage District, EPA believes that coverage under this permit should replace coverage under Permit No. MA0100374. Accordingly, EPA will revoke coverage under NPDES Permit MA0100374 upon the effective date of this permit.

VIII. SLUDGE INFORMATION AND REQUIREMENTS

The draft permit requires that the permittee comply with all existing federal and state laws that apply to sewage sludge use and disposal practices and with the Clean Water Act Section 405(d) technical standards (see 40 CFR Section 503). Sludge from the SESD WWTF is currently sent to an off-site facility for disposal; because the final disposal or use of the permittees sludge is done by others, the permittee is not subject to the requirements of 40 CFR Section 503. However, if the ultimate sludge disposal method changes, the permittee is responsible for complying with the applicable state and federal requirements.

IX. PRETREATMENT

The facility accepts industrial wastewater from 26 Significant Industrial Users (SIU), 18 of which are categorical SIUs.

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and Section 307 of the Act. The permittee's pretreatment program received EPA approval on September 28, 1990 and, as a result, appropriate pretreatment program requirements were incorporated into the previous permit, which were consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

Upon reissuance of this NPDES permit, the permittee is required to review its pretreatment program and modify it as necessary to ensure that it is consistent with current Federal Regulations. Those activities that the permittee must address include, but are not limited to, the following: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices.

Lastly, the permittee must continue to submit an annual report describing the permittee's pretreatment program activities for the twelve (12) month period ending 60 days before the due date in accordance with 403.12(i). The annual report shall be submitted **no later than March 1 of each year**.

The Permit requires the permittee to submit to EPA, within 60 days of the permit's effective date, all required modifications of the Streamlining Rule in order to be consistent with the provisions of the newly promulgated rule. To the extent the permittee's legal authority is not consistent with the required changes, they must be revised and submitted to EPA for review.

X. ANTI-BACKSLIDING

Anti-backsliding, as described in Section 402 (o) of the Clean Water Act and 40 CFR §122.44(l)(1), requires reissued permits to contain limitations as stringent or more stringent than those of the previous permit unless the circumstances allow application of one of the defined exceptions.

XI. ANTIDEGRADATION

The Massachusetts Antidegradation Policy is found at Title 314 CMR 4.04. All existing uses of the Salem Sound must be protected. This draft permit is being reissued with allowable discharge limits that are as stringent or more stringent than the current permit with the same parameter coverage. The effluent limit for oil and grease has been removed from the permit since recent data indicates there is no reasonable potential for oil and grease to cause an exceedance of the Water Quality Standards. There is no change in outfall location. The public is invited to participate in the anti-degradation finding through the permit public notice procedure.

XII. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat," 16 U.S.C. § 1855(b). The Amendments broadly define "essential fish habitat" (EFH) as: "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," 16 U.S.C. § 1802(10). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH, 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

Although EFH has been designated for this general location, EPA has concluded that this activity is not likely to affect EFH or its associated species for the following reasons:

- This is a reissuance of an existing permit with the same or stricter effluent limits;
- Limits specifically protective of aquatic organisms have been established for chlorine based on EPA water quality criteria;
- Acute and chronic toxicity testing is required four (4) times per year;
- The permit prohibits any violation of state water quality standards.

Accordingly, EPA has determined that a formal consultation with NMFS is not required. NMFS will be notified and EFH will be reinitiated if adverse impacts to EFH are detected as a result of this permit action or if new information becomes available that changes the basis for these conclusions.

Summary of Essential Fish Habitat (EFH) Designation

10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	42° 40.0' N	70° 50.0' W	42° 30.0' N	71° 00.0' W

Square Description (i.e. habitat, landmarks, coastline markers): Waters within the square within the Atlantic Ocean within Massachusetts Bay south of Marblehead, MA., Salem, MA., Danvers, MA., Beverly, MA., and Beverly Farms, MA. Features also affected include: Salem Harbor, Bass River, North River, Waters River, Crane River, Danvers River, Bass River, Salem Neck, Peaches Pt., Naugus Head, Pickering Pt., Derby Wharf, northern Marblehead Harbor, northwest Marblehead Neck, Woodbury Pt., Cove Village, Hospital Pt., and Curtis Pt., and western Salem Sound.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X	X		
pollock *(Pollachius virens)*	X	X	X	X
whiting *(Merluccius bilinearis)*	X	X	X	X
red hake *(Urophycis chuss)*	X	X	X	X
white hake *(Urophycis tenuis)*	X	X	X	X
redfish *(Sebastes fasciatus)*	n/a	X	X	X
winter flounder *(Pleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Pleuronectes ferruginea)*	X	X	X	X
windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*	X	X	X	X
ocean pout *(Macrozoarces americanus)*	X	X	X	X
Atlantic halibut *(Hippoglossus hippoglossus)*	X	X	X	X
Atlantic sea scallop *(Placopecten magellanicus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
bluefish *(Pomatomus saltatrix)*			X	X

long finned squid *(Loligo pealei)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a	X	X
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralicthys dentatus)*				X
scup *(Stenotomus chrysops)*	n/a	n/a	X	X
black sea bass *(Centropristus striata)*	n/a			X
surf clam *(Spisula solidissima)*	n/a	n/a	X	X
bluefin tuna *(Thunnus thynnus)*			X	X

XIII. MONITORING AND REPORTING

The permittee is required to monitor and report sampling results to EPA and the MassDEP within the time specified in the permit. The effluent monitoring requirements have been established to yield data representative of the discharge by the authority under Section 308(a) of the CWA in accordance with 40 CFR 122.441(j), 122.44, and 122.48.

The remaining general conditions of the permit are based primarily on the NPDES regulations 40 CFR 122 through 125 and consist primarily of management requirements common to all permits.

XIV. STATE PERMIT CONDITIONS

The NPDES Permit is issued jointly by the U. S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of the permit are, therefore, incorporated into and constitute a discharge permit issued by the MassDEP Commissioner.

XV. GENERAL CONDITIONS

The general conditions of the permit are based on 40 CFR Parts 122, Subparts A and D and 40 CFR 124, Subparts A, D, E, and F and are consistent with management requirements common to other permits.

XVI. STATE CERTIFICATION REQUIREMENTS

The staff of the Massachusetts Department of Environmental Protection ("MassDEP") has reviewed the draft permit. EPA has requested permit certification by the State pursuant to 40 CFR § 124.53 and expects that the draft permit will be certified.

XVII. PUBLIC COMMENT PERIOD AND PROCEDURES FOR FINAL DECISION

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection, MA Unit, One Congress Street, Suite-1100, Boston, Massachusetts 02114. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. Public hearings may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates a significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period and after a public hearing, if such a hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

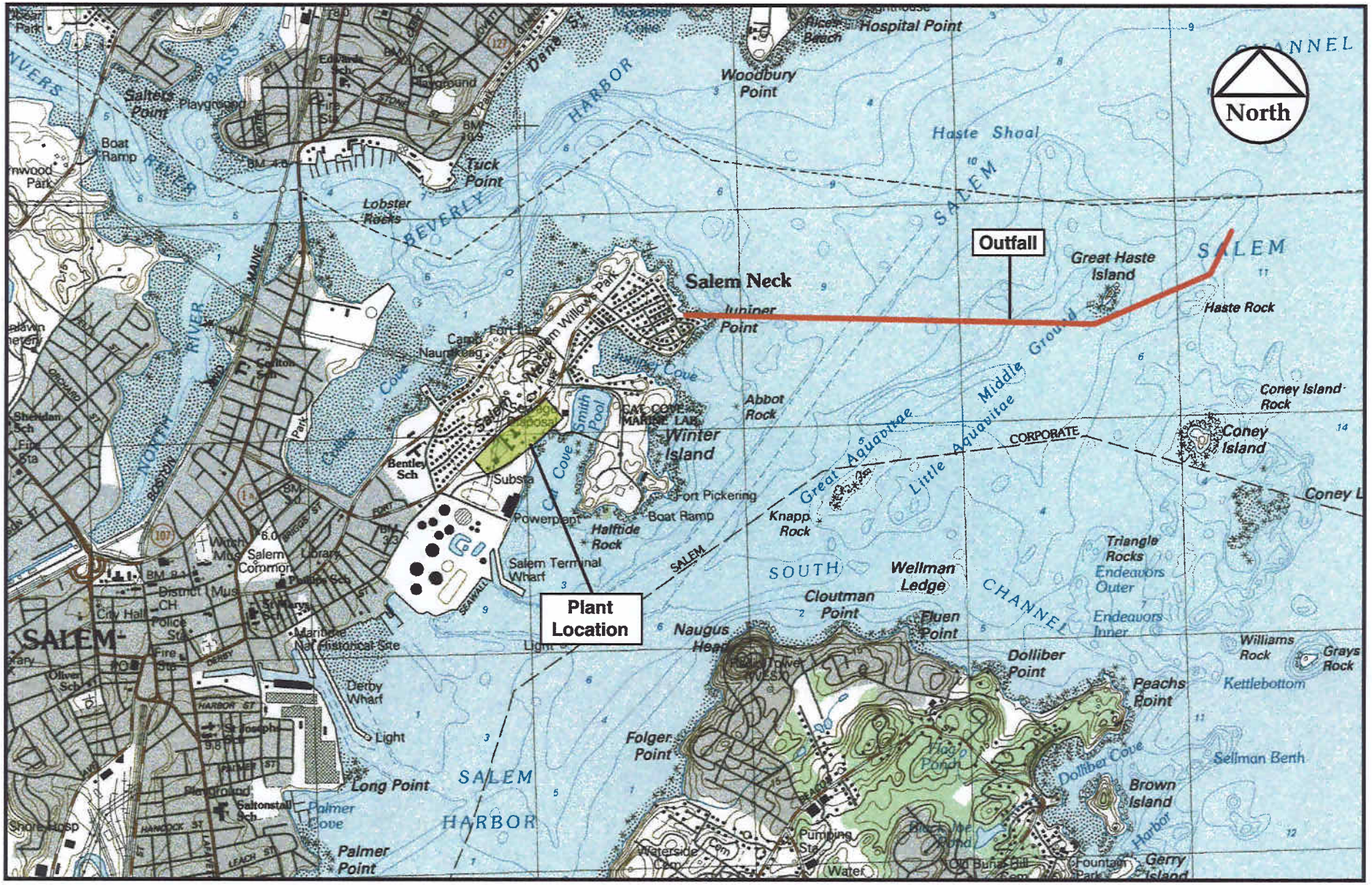
XVIII. EPA CONTACT

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Michele Cobban Barden
Office of Ecosystem Protection
U.S. Environmental Protection Agency
One Congress Street, Suite-1100 (CPE)
Boston, MA 02114-2023
Telephone: (617) 918-1539
Barden.Michele@epa.gov

March 26, 2008
Date

Stephen Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency



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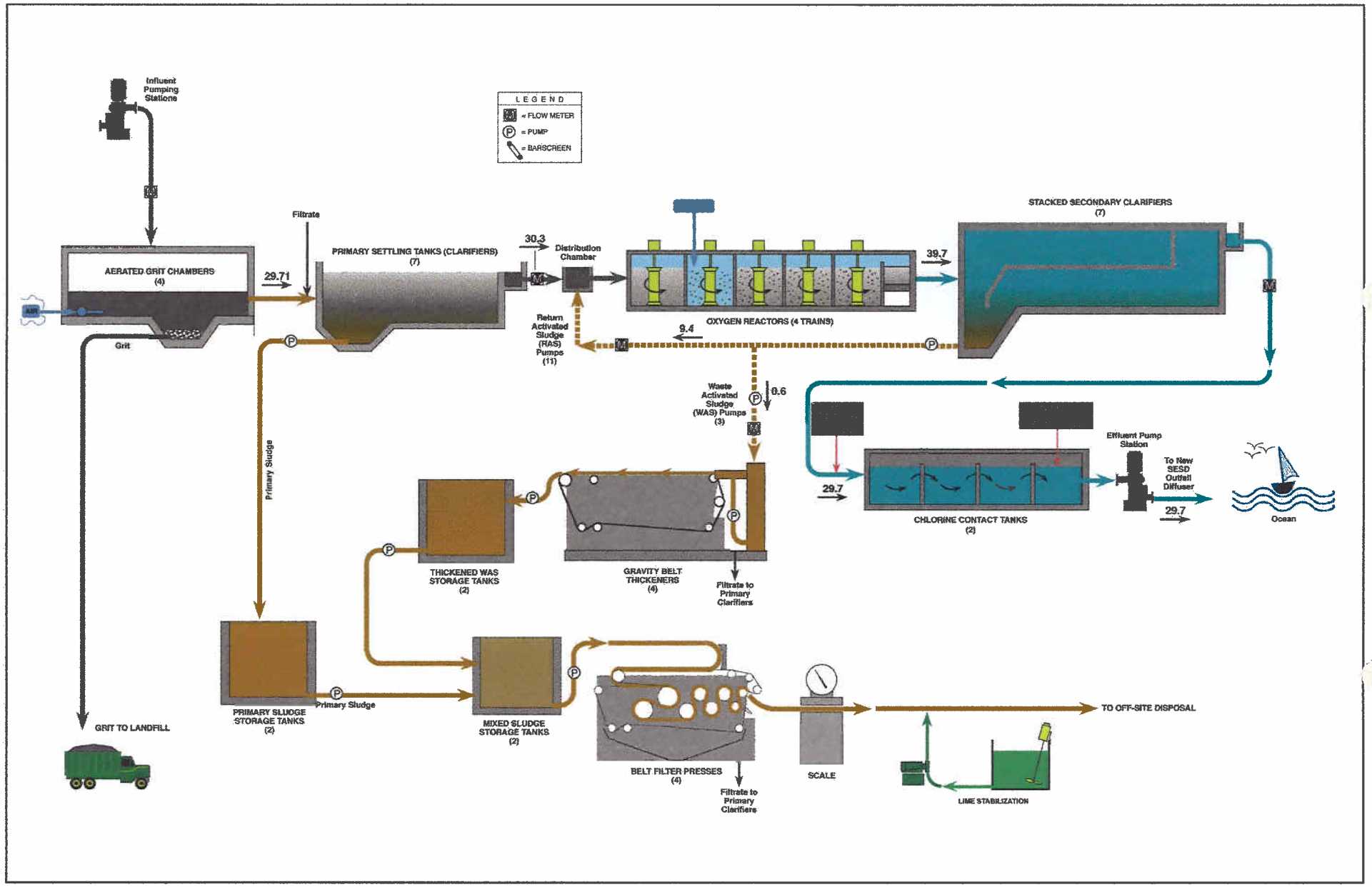
Scale in Feet

South Essex Sewerage District
Secondary Treatment Facilities

Figure 1
Facilities Location

CDM



South Essex Sewerage District
Wastewater Treatment Plant

CDM

Figure 2
Process Flow Schematic

OUTER SALEM SOUND

The area defined as Outer Salem Sound in this report is illustrated in Figure 16. Segment locations are also depicted.

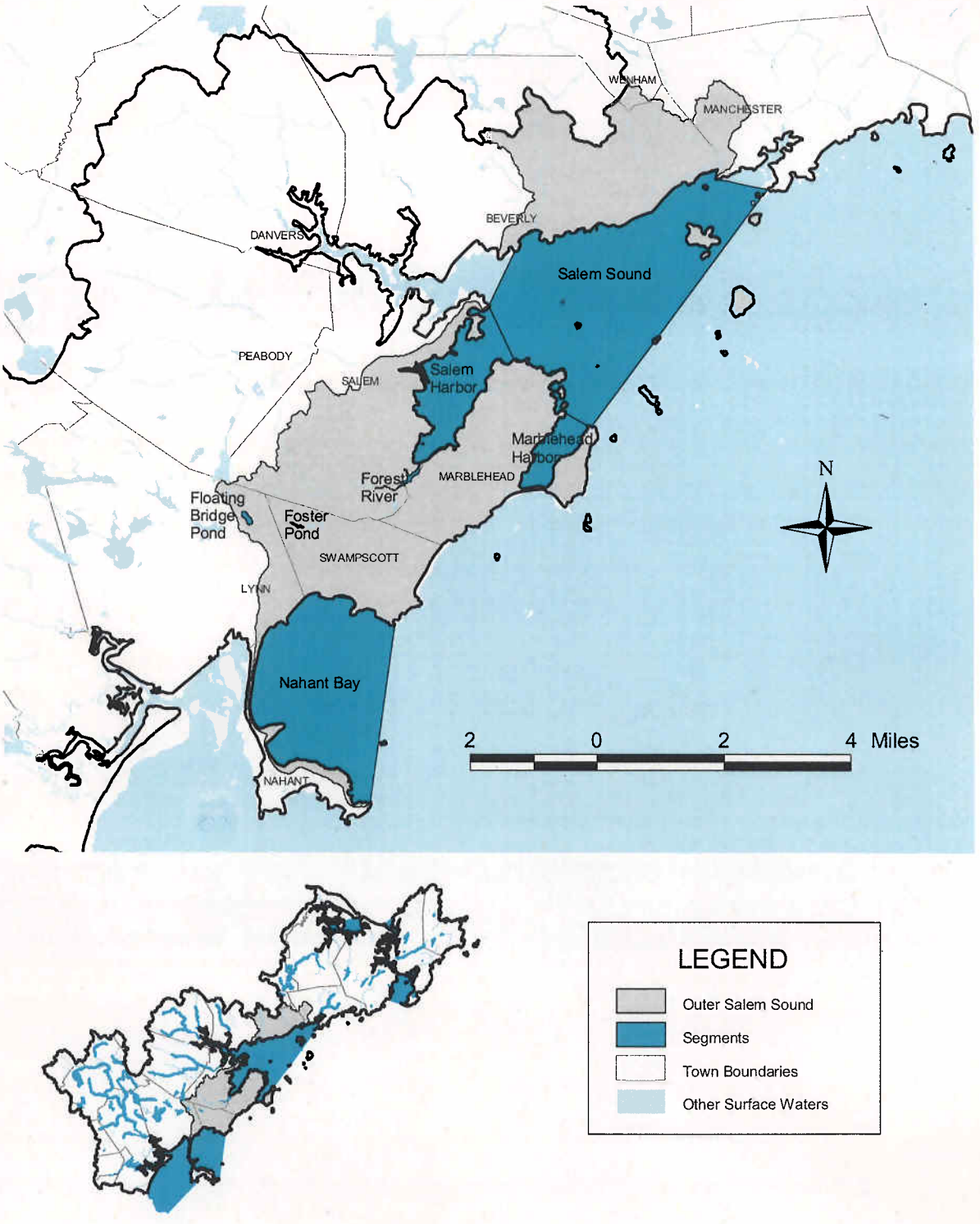


Figure 16. Locations of segments in the Outer Salem Sound Drainage Area.

Recent Discharge Monitoring Report (DMR) Data
South Essex Sewerage District WWTF

	Flow (MGD)		$CBOD_5$ (mg/l)			TSS (mg/l)			pH (S.U)		Oil & Grease (mg/l)	Fecal Colifrom Bacteria (Colonies/100 ml)		Total Residual Chlorine (ug/)	Total Nitrate (mg/l)	Total Ammonia Nitrogen, as N (mg/l)	Total Kjeldahl Nitrogen (mg/l)	Whole Effluent Toxicity LC50 Menidia	Whole Effluent Toxicity LC50 Mysid
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Minimum	Maximum	Maximum	Average Monthly	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily	Maximum Daily
Effluent Limit	***	Report	25	40	Report	30	45	Report	6	8	Report	200	400	0.338	Report	Report	Report	1.0	100%
Dec-07	24.98	36.13	10	12	14	10	15	22	6.7	6.8	8	11	22	0.1	0.73	18	26		
Nov-07	20.32	23.23	10	12	14	12	14	19	6.7	6.9	8	14	40	0.08	0.55	28	38		
Oct-07	18.98	21.59	9	10	12	11	13	16	6.6	7.1	8	17	283	0.06	0.34	29	35		
Sep-07	18.9	23.47	9	10	14	15	18	24	6.7	6.9	8	0		0.04	0.02	21	27		
Aug-07	19.21	20.68	10	11	14	17	19	30	6.7	7	8	15	23	0.27	0.02	29	37	81.0	100
Jul-07	20.41	22.25	10	10	14	15	15	25	6.5	6.9	8	15	33	0		24	41		
Jun-07	25.22	35.55	7	9	10	10	14	18	6.7	6.9	8	12	34	0.16	0.37	14	25	100.0	100
May-07	32.40	49.90	9	9	21	9	11	15	6.6	6.9	8.0	13	108	0.6	0.3	13	58		
Apr-07	45.36	85.98	13	22	29	15	28	43	6.6	6.9	8.0	16	56	0.11	0.8	10	16	100.0	100
Mar-07	33.36	53.46	13	17	60	14	20	81	6.6	6.8	8.0	15	70	0.11	0.2	14	21		
Feb-07	23.12	31.39	8	10	14	8	11	17	6.6	6.9	8.0	10	22	0.16	0.3	22	30	100.0	100
Jan-07	28.54	34.28	6	6	8	6	7	9	6.6	6.8	8.0	10	15	0.48	0.2	18	25		
Dec-06	27.81	35.16	8	9	12	9	11	15	6.6	7.0	8.0	15	49	0.1	0.3	15	21		
Nov-06	33.82	47.27	8	10	14	14	16	24	6.6	7.0	8.0	37	392	0.09	0.5	19	27		
Oct-06	23.31	39.31	8	10	16	12	15	30	6.6	6.8	8.0	16	94	0.11	0.5	24	23		
Sep-06	22.84	25.54	7	10	14	12	18	22	6.6	7.0	8.0	15	69	0.04	0.2	21	29		
Aug-06	23.17	25.69	10	11	17	15	18	31	6.6	7.1	8.0	17	47	0.11	0.2	24	32	100.0	100
Jul-06	29.39	45.07	10	12	19	18	24	38	6.6	6.8	8.0	27	310	0.07	0.2	22	30		
Jun-06	40.72	70.38	10	17	28	17	28	50	6.5	6.7	8.0	27	113	0.07	0.2	20	27	100.0	100
May-06	47.64	89.33	15	25	32	23	29	65	6.6	6.9	8.0	18	150	0.23	0.2	22	25		
Apr-06	22.83	25.22	16	21	33	23	27	58	6.5	7.0	8.0	11	19	0.1	0.2	22	27	99.9	100
Mar-06	24.17	26.72	16	18	18	16	17	51	6.6	6.8	8.0	11	50	0.1	0.2	20	27		
Feb-06	35.37	57.43	15	20	27	15	22	33	6.5	6.8	8.0	11	24	0.09	0.4	14	14	100.0	100
Jan-06	34.71	42.76	11	13	18	12	14	25	6.6	6.7	8.0	11	28	0.03	0.2	16	21		
Dec-05	31.77	39.53	11	12	21	10	12	22	6.5	7.5	5.0	15	57	0.11	0.2	14	24		
Nov-05	30.23	47.02	10	13	16	13	16	19	6.5	6.7	5.0	21	272	0.2	0.2	11	21		
Oct-05	32.15	71.96	12	14	24	16	18	34	6.5	6.8	5.0	31		0.32	0.2	33	36		
Sep-05	19.41	21.83	16	21	28	19	20	26	6.6	6.8	8.0	21	242	0.09	0.2	30	37		
Min	18.90	20.68	6.00	6.00	8.00	6.00	7.00	9.00	6.50	6.70	5.00	0.00	15.00	0.00	0.02	10.00	14.00	81.00	99.90
Max	47.64	89.33	16.00	25.00	60.00	23.00	29.00	81.00	6.70	7.50	8.00	37.00	392.00	0.60	0.80	32.90	58.00	100.00	100.00
Avg	28.22	41.00	10.61	13.36	20.04	13.79	17.50	30.79	6.59	6.90	7.68	16.14	100.85	0.14	0.29	20.22	28.55	97.61	99.99