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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE ADMINISTRATOR

In Re:

CITY OF NEW BEDFORD, MASSACHUSETTS NEW BEDFORD PUBLICLY OWNED TREATMENT WORKS, APPLICATION FOR SECTION 301(h) VARIANCE FROM THE SECONDARY TREATMENT REQUIREMENTS OF THE CLEAN WATER ACT	TENTATIVE DECISION OF THE ADMINISTRATOR PURSUANT TO 40 CFR PART 125, SUBPART G

I have reviewed the attached evaluation analyzing the merits of the application of the City of New Bedford, Massachusetts for the New Bedford publicly owned treatment works requesting a variance from the secondary treatment requirements of the Clean Water Act pursuant to Section 301(h). It is my tentative decision that the application for the New Bedford publicly owned treatment works be denied. The Regional Administrator of Region I is hereby directed to prepare a notice of intent to deny in accordance with this decision.

Pursuant to the procedures of the Consolidated Permit Regulations, 40 CFR Part 124 (45 Fed. Reg. 33484 et seq.) public notice, comment, and administrative appeals regarding this decision are available to interested persons.

Dated: OCT 18 1982

Administrator

New Bedford, Massachusetts

- o Task Force recommends denial of waiver
- o Natural conditions
  - Adequate supply of dilution water
  - Benthic community and ambient suspended solids of receiving water are indicative of estuarine system
  - Poor tidal mixing, sluggish circulation, and slow flushing result in long residence times (i.e., weeks to months)
  - Due to shallow depth, diffuser may be inadequate to disperse pollutants
  - Onshore transport
- o Existing facilities consist of a 30 mgd primary treatment plant which receives an industrial flow of 5.3 mgd (21 percent of total flow)
- o Proposed improvements include extension of outfall and addition of diffuser
- o Discharge characteristics (Proposed)
  - Effluent discharged 3.4 mi offshore at a depth of 45 ft
  - High flow (29.4 mgd)
  - Low critical initial dilution (59:1)
  - Will not meet State water quality standards adopted to protect marine life
- o Ecological impacts
  - Concentrations of metals and toxics may exceed water quality criteria after initial dilution causing ecological and health problems
  - Closure of commercial and recreational shellfishing areas due to coliform and PCB contamination
- o Economic impacts (1981 dollars)
  - Cost of secondary treatment are approximately $22.3 million
  - Cost estimates for extending the existing outfall and adding the diffuser range between $25.4 and $55.7 million
  - No savings in construction costs would have resulted from an exemption from full secondary
  - Annual operations and maintenance costs would have been reduced by $1.1 million

ANALYSIS OF THE SECTION 301(h)

SECONDARY TREATMENT WAIVER APPLICATION

FOR

NEW BEDFORD, MASSACHUSETTS

PREPARED BY:

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF MARINE DISCHARGE EVALUATION

INTRODUCTION

The City of New Bedford, Massachusetts (the applicant) has requested a variance under Section 301(h) of the Clean Water Act, 33 U.S.C. Section 1311(h), (the Act) from the secondary treatment requirements contained in section 301(b)(1)(B) of the Act, 33 U.S.C. Section 1311(b)(1)(B). The variance is being sought for the New Bedford publicly owned treatment works (POTW). This document presents Findings, Conclusions, and Recommendations of the Environmental Protection Agency's (EPA) 301(h) Task Force regarding the compliance of the applicant's proposed discharge with the criteria set forth in Section 301(h) of the Act as implemented by regulations contained in 40 CFR Part 125, Subpart G (44 Fed. Reg. 34784, June 15, 1979, as amended by, 47 Fed. Reg. 24918, June 8, 1982).1/

The 301(h) Task Force is comprised of scientists and engineers from the Office of Water, the Office of Research and Development, and Regional Offices.

Tetra Tech, Inc., an outside contractor, was retained by EPA to prepare a Technical Evaluation Report (TER) analyzing the data submitted by the applicant. The TER was prepared subject to the guidance and review of the 301(h) Task Force in accordance with EPA Contract No. 68-01-5906. The Task Force then reviewed the data, references, and empirical evidence contained in the variance application as evaluated by Tetra Tech and applied the statutory and regulatory criteria to determine if the applicant's proposed discharge qualified for a variance.

The applicant is seeking a variance to discharge treated sewage to Buzzards Bay, a saline estuary.2/ The applicant commenced its discharge to marine waters in January 1974, and submitted a final application on September 13, 1979. The application is based on an improved discharge involving outfall extension with the addition of a diffuser, and improved operation of the existing primary treatment facility. The applicant is requesting a variance for biochemical oxygen demand (BOD) and suspended solids (SS). The applicant's present and proposed treatment levels are as shown in the table below:

1/ All references to 40 CFR Part 125, Subpart G in this document are to the 301(h) regulations as amended by 47 Fed. Reg. 24918, June 8, 1982.

2/ See Description of Receiving Water section of this document.

Effluent Limits

(Monthly Average)

	Present [Actual]	Proposed [Permit]
BOD mg/l (lbs/day)	123 (25,646)	97 (23,800)
SS mg/l (lbs/day)	122 (25,437)	50 (12,300)
pH	6-9	6-9
Flow (mgd)	25	29.4

DECISION CRITERIA

Under Section 301(b)(1)(B) of the Act, 33 U.S.C. Section 1311(b)(1)(B), publicly owned treatment works in existence on July 1, 1977, were required to meet effluent limitations based upon secondary treatment as defined by the Administrator. Secondary treatment has been defined by the Administrator in terms of three parameters: biochemical oxygen demand (BOD), suspended solids (SS) and pH. Uniform national effluent limitations for these pollutants were promulgated and included in permits for POTWs issued under Section 402 of the Act. POTWs were required to comply with these limitations by July 1, 1977.

Congress subsequently amended the Act, adding Section 301(h), which authorizes the Administrator of EPA, with State concurrence, to issue Section 402 permits which modify the secondary treatment requirements of the Act. P.L. 95-217, 91 Stat. 1566, as amended by, P.L. 97-117, 95 Stat. 1623. Section 301(h) provides that:

> The Administrator, with the concurrence of the State, may issue a permit under section 402 [of the Act] which modifies the requirements of subsection (b)(1)(B) of this section [the secondary treatment requirements] with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that-
>
> (1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 304(a)(6) of this Act;
>
> (2) such modified requirements will not interfere with the attainment or maintenance of that water quality which assures protection of

public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife, and allows recreational activities, in and on the water;

(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable;

(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;

(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;

(6) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(7) there will be no new or substantially increased discharges from the point source of the pollutant to which the modification applies above that volume of discharge specified in the permit.

For the purposes of this subsection the phrase "the discharge of any pollutant into marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and section 101(a)(2) of this Act. A municipality which applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters.

EPA regulations implementing section 301(h) provide that a 301(h) modified National Pollutant Discharge Elimination System

(NPDES) Permit may not be issued in violation of 40 CFR 125.59(b), which requires among other things, compliance with the provisions of the Coastal Zone Management Act (16 U.S.C. 1451 et seq.), the Endangered Species Act (16 U.S.C. 1531 et seq.), the Marine Protection Research and Sanctuaries Act (16 U.S.C. 1431 et seq.), and any other applicable provision of State or Federal law or Executive Order. In the discussion which follows, the data submitted by the applicant is analyzed in the context of the statutory and regulatory criteria.

SUMMARY OF FINDINGS

Based upon review of the data, references, and empirical evidence furnished in the application and the Technical Evaluation Report, the 301(h) Task Force makes the following findings with regard to compliance with the statutory and regulatory criteria:

- The proposed discharge is expected to violate the Commonwealth of Massachusetts water quality standards for dissolved oxygen, but is not expected to violate the Commonwealth's standards for suspended solids. [Section 301(h)(1), 40 CFR 125.60].

- The applicant's discharge will not adversely impact public water supplies but is expected to interfere with the protection and propagation of a balanced indigenous population of marine life and will not allow for recreational activities. [Section 301(h)(2), 40 CFR 125.61].

- The applicant has established a system for monitoring the impact of its discharge. [Section 301(h)(3), 40 CFR 125.62]. This program contains deficiencies as discussed in Part C, Sections 2-3, of the TER.

- The proposed discharge would not impact other point and nonpoint sources [Section 301(h)(4), 40 CFR 125.63].

- The applicant has developed a program to enforce all applicable pretreatment requirements. [Section 301(h)(5), 40 CFR CFR 125.64]. This program contains deficiencies as discussed in Part E, Sections 1-2 of the TER.

- The applicant has proposed a schedule of activities intended to limit the entrance of toxic pollutants[3/] from nonindustrial sources into the treatment works. [Section 301(h)(6), 40 CFR 125.64]. This schedule of activities contains deficiencies, as discussed in Part E, Section 3 of the TER.

- There will be no new or substantially increased discharges from the point source of the pollutants to which the variance applies above those specified in the permit. [Section 301(h)(7), 40 CFR 125.65].

CONCLUSION

It is the conclusion of the 301(h) Task Force that the applicant's proposed discharge will adversely impact the ecosystem and beneficial uses of the receiving waters and will not comply with the requirements of Section 301(h) and 40 CFR Part 125, Subpart G, as stated above.

RECOMMENDATION

It is the recommendation of the 301(h) Task Force that the applicant's variance request be denied in accordance with the above conclusions and that a draft notice of intent to deny be prepared in accordance with the Consolidated Permit Regulations, 40 CFR Parts 122-125.

DESCRIPTION OF THE TREATMENT FACILITY

The application submitted by the City of New Bedford for the New Bedford treatment plant located in Massachusetts (Figure 1) is based upon an improved discharge. The proposed improvement consists of an extension of the outfall and the addition of a diffuser and improvements to the treatment plant to provide proper and efficient treatment.

The New Bedford primary wastewater treatment plant began discharging to marine waters in January 1974, and serves an area with a population of approximately 101,000 people. The wastewater collection system includes both combined (60 percent) and separate (40 percent) sanitary sewers and receives residential and industrial sewage. Approximately 22 percent of the proposed influent is expected from industrial sources by 1988. The average flow is 1.09m^3/sec (25 mgd). The projected

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3/ "Toxics" or "toxic pollutants" as used throughout this document refers to both toxic pollutants as defined in 40 CFR 125.58(t) and pesticides as defined in 40 CFR 125.58(k).

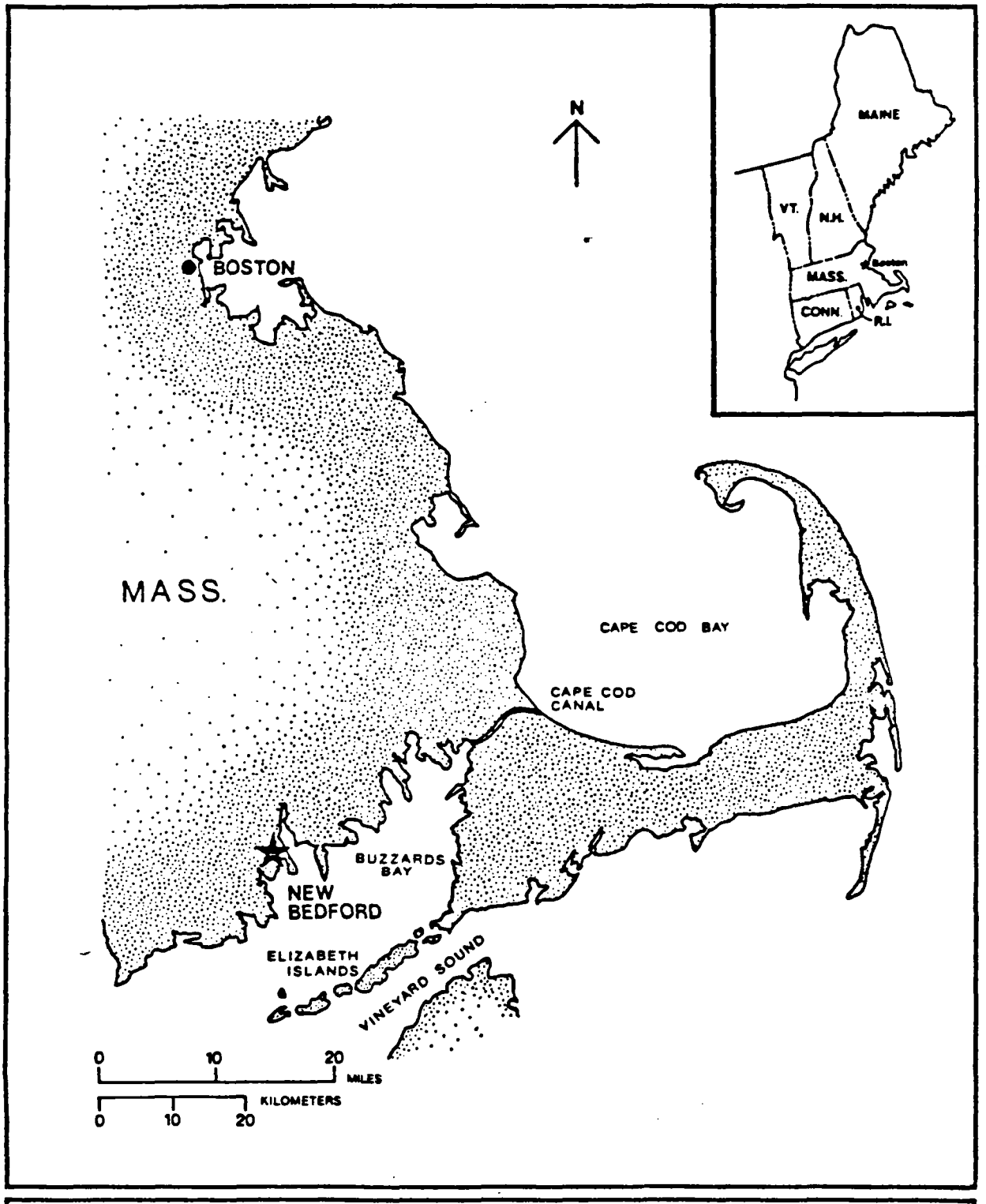

Figure 1. General location of the New Bedford, MA, treatment plant.

average flow for 1988 is 1.29m^3/sec (29.4 mgd). The plant design capacity is given as 1.31m^3/sec (30 mgd).

During dry-weather, the wastewater influent receives primary treatment. The unit processes include grit collection; bar screens; primary sedimentation; chlorination; and sludge degritters, thickeners, and centrifuges. The dewatered sludge is incinerated and the ash disposed of in a wetwell. During wet-weather, flow in excess of 30 mgd is chlorinated and discharged through the wet-weather outfall.

The existing outfall for dry-weather flow is a 1.52m (60 in) diameter pipe extending 1,006m (3,300 ft) into Buzzards Bay (Figure 2). The outfall ends in a single 90° cast iron elbow port encased in concrete and rip-rap at a depth of 8.8m (29 ft) below mean sea level. Excess storm flow is discharged through a 1.83m (72 in) diameter pipe extending 305m (1,000 ft) into Buzzards Bay to a depth of 7.3m (24 ft).

The existing dry-weather outfall will be abandoned and the existing wet-weather outfall will be extended 6.7 km (22,000 ft) further into Buzzards Bay and a 250m (820 ft) diffuser will be added. The multiport diffuser (Figure 2) would be located in 13.7m (45 ft) of water. The proposed outfall would be located at 41°32'10" N latitude and 70°52'06" W longitude. There are plans to improve the efficiency and operation of the existing primary treatment plant.

DESCRIPTION OF THE RECEIVING WATER

The site of the existing and proposed discharges is New Bedford Harbor within Buzzards Bay, an estuarine embayment in southeastern Massachusetts (Figure 2). In the Bay, circulation is sluggish and flushing is slow due to the absence of significant freshwater flows and the relatively slow tidal currents. The estuarine circulation of the Bay (net motion landward on the bottom and seaward near the surface) combined with long residence times indicates that pollutants entering the system will remain there for periods of weeks to months.

The applicant indicates that the proposed outfall will be an ocean discharge. The outfall is located in a relatively shallow (average depth 11m; 36 ft), semi-enclosed body of water, which shows freshwater dilution of salinity. Ambient suspended solids concentrations are about 40 mg/l, which are characteristic of estuarine systems but not of ocean systems. The offshore benthic community in New Bedford Harbor and Nasketucket Bay is dominated by the polychaete worm, Nephytys incisa, and the clam, Nucula proxima. The Nephytys/Nucula assemblage is characteristic of estuaries in the Northeast (Sanders, 1956) and this provides further evidence of the

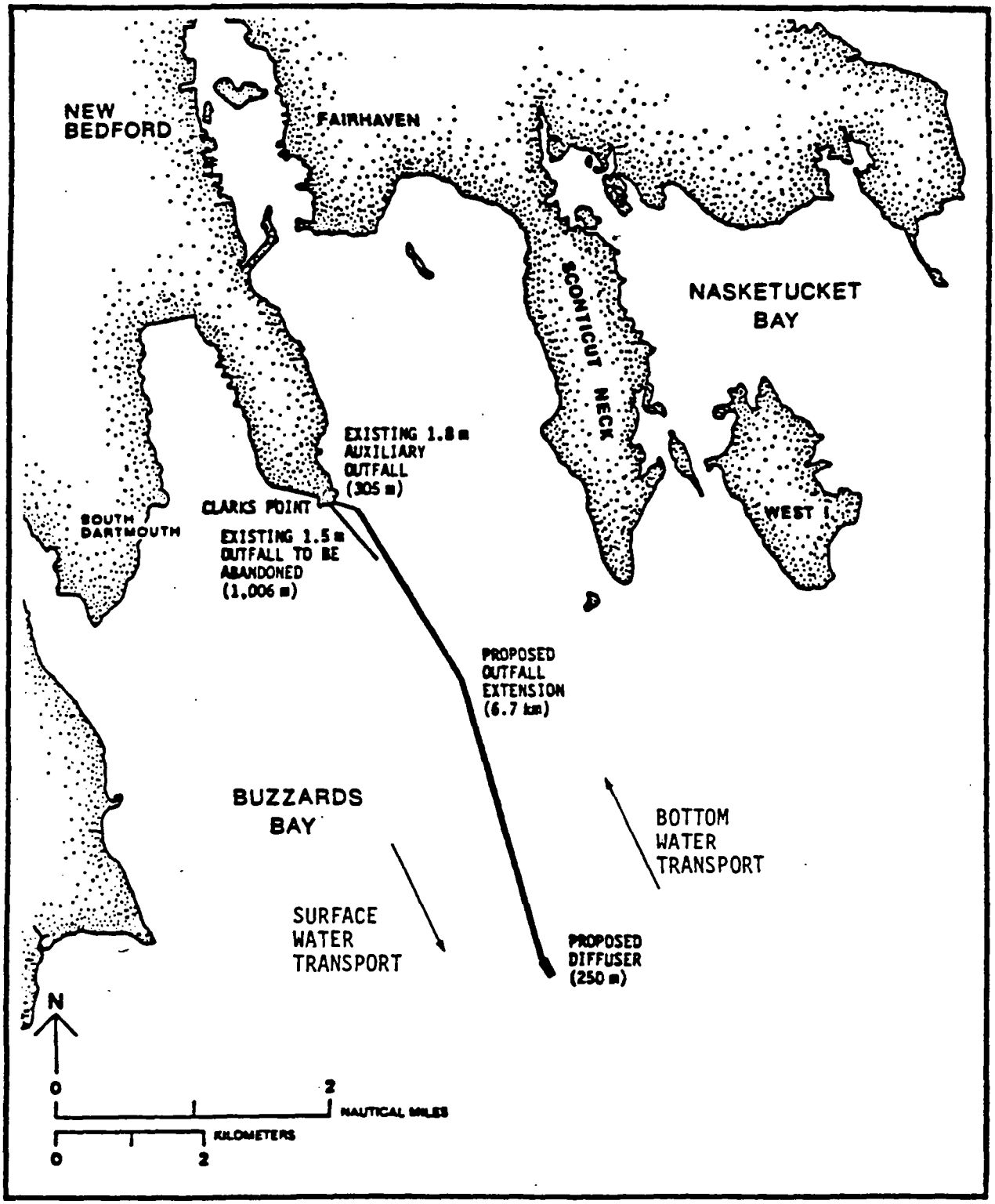

Figure 2. Location of the existing and proposed outfalls for the New Bedford treatment plant.

estuarine nature of the area. The 301(h) Task Force concludes that the Buzzards Bay system is an estuary and that the special restrictions in 125.61(c)(iii) therefore apply.

Estuaries such as New Bedford Harbor within Buzzards Bay are extremely productive ecosystems for the feeding, protection, and nursery grounds of many species of fish and shellfish. For example, maturing fish, crab, lobster, and shrimp pass through several distinct developmental stages, each of which has unique feeding requirements. These requirements are met in the shallow bays, creeks, and marshes found only in a saline estuary. Estuaries trap and concentrate the nutrients that these organisms feed on as they pass through the foodweb and are continuously being recycled. Recycling activities by organisms within the sediment, formation of organic complexes from the breakdown of decaying material, and the recovery of nutrients from deep sediments by microbial activity, make estuaries self-enriching ecosystems.

Due to their uniqueness, estuaries are a resource of special biological and economic significance. However, the physical and biological characteristics that make the estuary so valuable also act to make it ecologically vulnerable. This tendency for retention and rapid recycling of nutrients makes estuaries susceptible to pollution effects because toxic pollutants get trapped along with useful nutrients. Certain toxic organic compounds such as PCBs are resistant to chemical and biological degradation and may remain unchanged in the estuary for years, acutely and chronically impacting the entire ecosystem. In addition to upsetting the ecological balance, the accumulation of toxic pollutants can threaten the well-being of many important estuarine commercial and sport fisheries.

Effects on one portion of the biological ecosystem can affect other organisms and components of the ecosystem. Alterations in the benthic population, for example, can result in a benthic population dominated by pollution-tolerant species, which may in turn decrease the food supply of fish, resulting in a decrease in fish variety and numbers. The biological ecosystem in New Bedford Harbor is currently demonstrating signs of pollution impacts.

Pollution has adversely impacted the fishery resources of New Bedford Harbor (TER, Part B, Section 6). The Massachusetts Department of Public Health (MDPH) issued a closure order in 1979 restricting the taking of lobster, fish, and shellfish from various portions of the Harbor due to PCB contamination (Figure 3). Mass mortalities of menhaden have occurred inside the hurricane barrier (inner harbor) during 1976, 1977, and 1978. Because of the severe problem of PCB pollution, New

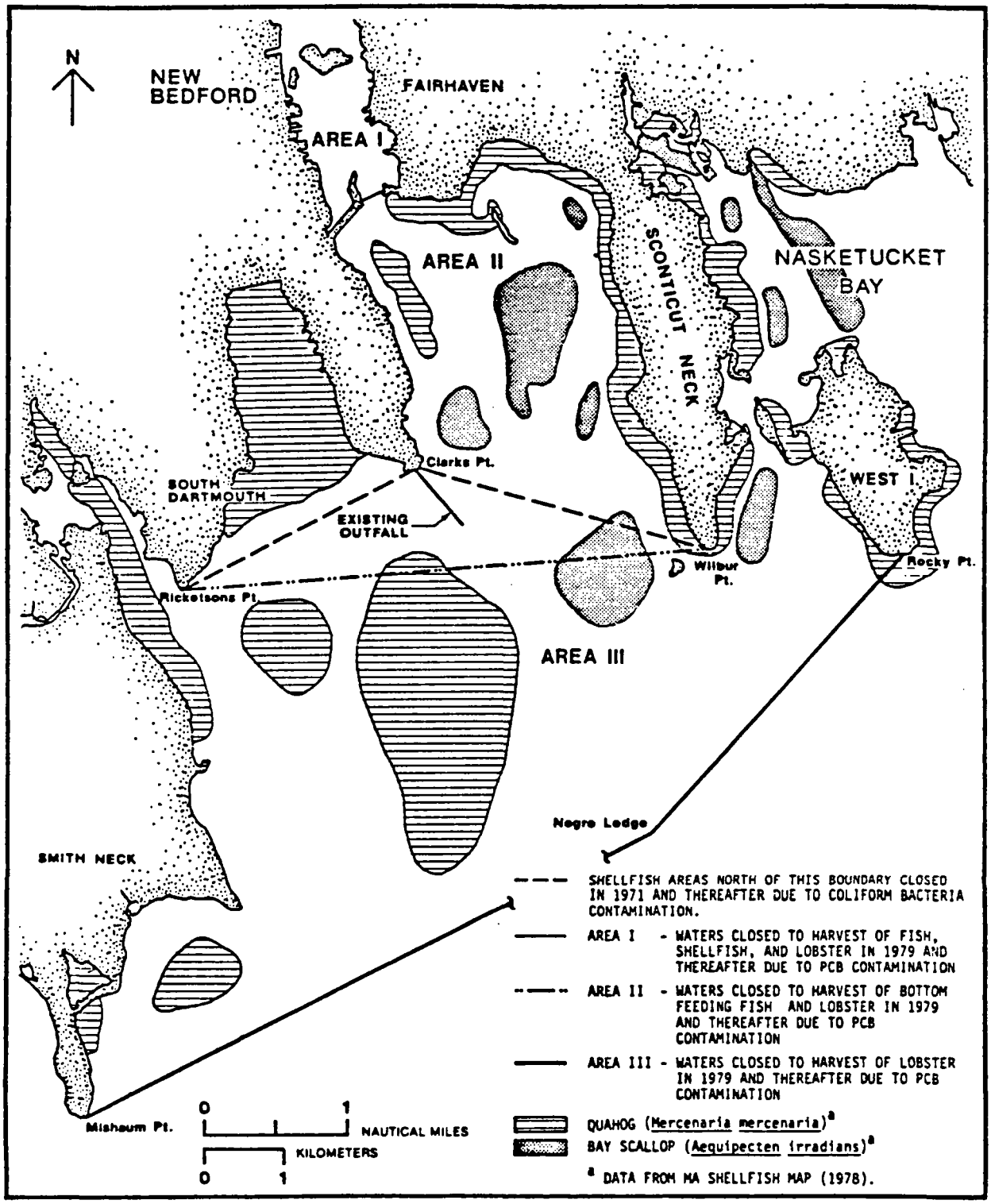

Figure 3. Location of shellfish beds and closed areas in New Bedford Harbor.

Bedford Harbor was recently added to the list of Additional Superfund Priority sites (July 23, 1982) for remedial action in addressing hazards related to hazardous waste disposal sites.

New Bedford Harbor supports a commercial fishing fleet of over 150 vessels, which landed over 76 million lbs of fish in 1981 with an estimated value of $78 million. No commercial fishing is conducted within the harbor or in Buzzards Bay because net fishing is prohibited due to PCB contamination. Demersal fish observed in the area include scup, butterfish, black sea bass, red hake, cunner, and northern pipefish. Alewives annually migrate up the Acushnet River via New Bedford Harbor. Lobster fishing supports approximately 50 commercial lobstermen. The value of the 1977 commercial lobster harvest exceeded $25,000 (Kolek and Cuervels, 1981). Quahogs are the dominant commercial bivalve species in the area, followed by the false quahog, oysters, and bay scallops. Crab species present include mainly spider and blue crabs. The subtidal benthic habitat is predominantly sand and mud. In non-polluted areas the benthic infaunal communities are composed of clams and worms characteristic of estuaries in the region. Rocky intertidal communities are common along the shore and are dominated by barnacles and the New England rockweed.

The area of Buzzards Bay around Clarks Point and New Bedford supports numerous recreational activities, including fishing, shellfishing, boating, swimming, wading, picnicking, and other beach activities. Popular sport fishes in New Bedford's outer harbor include bluefish, scup, striped bass, and Atlantic mackerel. Kolek and Cuervels (1981) reported that recreational lobstermen set lobster pots in New Bedford Harbor.

In summary, the state of the receiving waters of Buzzards Bay is currently one of degradation in terms of restrictions on fishery resources, due to adversely high toxic pollutant contamination and benthic alteration. The Bay is a very important ecosystem habitat for commercial and recreational, migratory and local fishes, and the effects of degradation of the Bay on these higher organisms is a matter of serious concern.

APPLICATION OF STATUTORY AND REGULATORY CRITERIA

1. State Water Quality Standards [Section 301(h)(1), 40 CFR 125.60]

Under 40 CFR 125.60, which implements Section 301(h)(1), there must be a State water quality standard applicable to each pollutant for which the modification is requested and the applicant must demonstrate that the proposed modified discharge will comply with these standards. In a letter of March 10,

1980, the Commonwealth of Massachusetts, Division of Water Pollution Control determined that the application did not contain sufficient information to enable an assessment of compliance. Additional data were thereafter developed and used in this document, and the Commonwealth has indicated in a subsequent letter that the proposed discharge will meet standards for dissolved oxygen (see dissolved oxygen section).

The applicant has requested modified requirements for biochemical oxygen demand (BOD) which affects dissolved oxygen (DO) and suspended solids (SS) which affect the turbidity or light attenuation in the receiving waters. The Commonwealth of Massachusetts has established water quality standards for dissolved oxygen (numerical) and total suspended solids (qualitative).

The waters at the existing and proposed discharge sites have been designated Class SA. Commonwealth of Massachusetts Water Quality Standards provide that: "Waters assigned to this class are designated for the uses of protection and propagation of fish, other aquatic life and wildlife; for primary and secondary contact recreation; and for shellfish harvesting without depuration [cleansing] in approved areas."

(a) Dissolved Oxygen (DO):

The water quality standard for Class SA waters requires that the dissolved oxygen "Shall be a minimum of 6 mg/l." The Commonwealth does not have a receiving water standard for BOD.

The final DO after initial dilution can be estimated by the following equation: $DO_f = DO_a + (DO_e - IDOD - DO_a)/Sa$ where DO_a is the DO concentration in the ambient water (i.e., the DO which occurs naturally); DO_e is the DO concentration in the effluent; IDOD is the maximum immediate dissolved oxygen demand of the effluent; and Sa is the critical initial dilution factor.

The following data are used to calculate the final DO following initial dilution for the worst case conditions:

DO_a	=	6.4 mg/l	Station E, August 12, 1980 letter, Mayor, City of New Bedford, to Director, OMDE [4/]
DO_e	=	0.0 mg/l	TER, Part B, Section 2
IDOD	=	1.13 mg/l	TER, Part B, Section 2
Sa	=	59:1	TER, Part B, Section 1

Using these values and the formula set forth above, the final DO for the proposed discharge at the boundary of the zone of initial dilution is 6.3 mg/l, which will not violate the Commonwealth's standard for dissolved oxygen of 6.0 mg/l.

The far-field oxygen depletion after initial dilution is 0.1 mg/l. The final far-field DO would be 6.2 mg/l, which would be above the Commonwealth DO standard of 6.0 mg/l.

The applicant has made an error in evaluating the steady state oxygen demand of sediment resulting in a value of 0.05 mg/l. The TER (Part B, Section 2) used the applicant's method and substituted a more correct diffusion coefficient which results in an oxygen demand of 0.4 mg/l. The sediment oxygen demand used in the TER calculation was 1.3 g O_2/m^2/day, which the applicant reports is for undisturbed sediments in the Charles River near Boston. Using additional unverified rates and coefficients the TER calculates a steady state sediment demand of 0.1 mg/l. The Commonwealth of Massachusetts in a letter (September 23, 1982, from Director of Division of Water Pollution Control, Executive Office of Environmental Affairs, to OMDE Director) also used 1.3 mg O_2/m^2/day for its analysis and concluded that steady state sediment oxygen demand will not result in a violation of state DO standards. However *in situ* sediment oxygen uptake rates measured near Woods Hole, Massachusetts and at a control site in Buzzards Bay are 2.3 g

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[4/] These data were submitted by the applicant in its letter of November 17, 1981 to Director, OMDE and were collected in the summer and fall of 1980 at seven stations, of which Station E is located near the site of the proposed discharge. The ambient DO used in this analysis was chosen from these data in lieu of ambient DO data provided in the Application, which was not representative of ambient DO near the proposed discharge area. The data used in the TER were also rejected by the Commonwealth's Executive Office of Environmental Affairs, (Letter from The Commonwealth of Massachusetts to Mayor, New Bedford, March 11, 1980).

$O_2/m^2/day$, and 1.9 g $O_2/m^2/day$ respectively, as reported by Smith et al., 1973. Because of the closer proximity of the Woods Hole and central Buzzards Bay sites to the proposed outfall location sites, the Task Force believes that it is more appropriate to use the rates measured near Woods Hole and at Buzzards Bay to predict the oxygen depletion. The use of these coefficients and the applicant's method result in steady state oxygen demands of 0.7 mg/l and 0.6 mg/l, respectively. Thus the Task Force concludes that the DO depletion caused by steady state sediment demand is most likely to be between 0.6 - 0.7 mg/l.

Using a DO depletion of 0.6 mg/l and a bottom ambient DO of 6.3 mg/l the resultant DO would be 5.7 mg/l, which is below the Commonwealth's DO standard.

The TER (Part B, Section 2) estimates the oxygen depletion due to the abrupt resuspension of sediments in the bottom 2 m as 0.6 mg/l. The resultant final DO will be 5.7 mg/l which violates the Commonwealth's DO standard.

In summary, the Task Force concludes that the Commonwealth dissolved oxygen standards would be violated by the sediment oxygen demands and the oxygen depletion due to the abrupt resuspension of sediments.

(b) Turbidity and/or Light Attenuation:

The Commonwealth of Massachusetts water quality standard specifies that "Color, turbidity, and total suspended solids shall not be in concentrations or combinations that would exceed the recommended limits on the most sensitive receiving water use." There are no quantitative limitations on these parameters.

The TER (Part B, Section 4) calculates final suspended solids concentration at the ZID-boundary to be 4.3 and 6.2 mg/l for the applicant's reported ambient suspended solids concentrations of 2 and 4 mg/l, respectively. However, the TER (Part B, Section 4) shows ambient suspended solids concentrations ranging from 0.36 to 6.1 mg/l obtained in November, 1975 and during January, March, and April, 1976. Also, data received subsequent to the preparation of the TER show ambient values ranging from 15 to 36 mg/l at the surface and 5.5 to 42 mg/l at the bottom from the proposed discharge location taken in July, September, and October, 1980. (Letter; Mayor, City of New Bedford, to Director, OMDE; dated November 17, 1981).

The TER (Part B, Section 2) shows that monthly maxima of effluent suspended solids concentrations frequently exceed 300

mg/l with monthly averages exceeding 100 mg/l 83 percent of the time for the existing treatment plant. After planned improvements are completed, the annual average suspended solids concentration is projected to be 50 mg/l.

At the proposed 50 mg/l limitation, the maximum increase in ambient suspended solids is less than 1 mg/l which is small compared to the natural range of variability. An increase of this magnitude is barely measurable. The small increase in suspended solids will still be in the range of natural variability and for the design flow should not have an adverse effect on the receiving water and its beneficial uses.

Thus the proposed discharge is expected to comply with the Comonwealth's qualitative standard for suspended solids. However, the Commonwealth has not yet expressed its finding.

2. Maintenance of That Water Quality Which Assures Protection Of Public Water Supplies, A Balanced Indigenous Population (BIP) Of Shellfish, Fish, And Wildlife And Recreational Activities In And On The Water [Section 301(h)(2), 40 CFR 125.61].

   (a) Physical Characteristics Of The Discharge [40 CFR 125.61(a)(1)]

   - Outfall and Diffuser Design [40 CFR 125.61(a)(1)(i)]

Outfall/diffuser design (e.g., port spacing, port diameter and configuration, velocity and angle of discharge, depth of discharge) significantly affects the degree of initial dilution which an outfall can achieve. 40 CFR 125.61(a)(1)(i) provides that the proposed outfall and diffuser must be well designed, in accordance with accepted engineering principles applicable to outfall and diffuser systems, to provide appropriate initial dilution, dispersion, and transport of wastewater.

The design parameters computed for the preliminary design of the applicant's proposed outfall/diffuser system compare favorably with accepted design criteria (TER, Part B, Section 1) developed from deepwater outfall/diffusers. However, in this shallow depth receiving water the outfall/diffuser design will not be adequate to provide appropriate initial dilution, dispersion, and transport of wastewater to comply with all applicable water quality standards.

- Initial Dilution [40 CFR 125.61(a)(1)(ii)]

A high degree of initial dilution serves to prevent high concentrations of pollutants from occurring in the receiving waters and therefore is conducive to attainment of water quality which assures protection of marine organisms. Dilution is usually expressed as the ratio of the total volume of a sample (ambient water plus wastewater) to the volume of wastewater in that sample. In deep water, a properly designed outfall can usually achieve an initial dilution ratio of 100:1. 40 CFR 125.61(a)(1)(ii) requires that initial dilutions be sufficient to meet applicable State water quality standards at and beyond the zone of initial dilution (ZID) during critical conditions - i.e., during "worst case" ambient conditions.

The applicant used the EPA Model DKHPLM to calculate the critical initial dilution but misinterpreted the results. The applicant incorrectly used the initial dilution at the height of rise whereas the correct critical initial dilution to use in determining compliance with water quality standards is at the trapping level. The TER (Part B, Section 1) computes the initial dilution using the applicant's worst case density profile (July), the applicant's lowest ten percentile current speed (0.03 m/sec, 0.098 ft/sec), and the EPA Model DKHPLM. For the maximum flow of 2.02 m^3/sec (46 mgd) the critical initial dilution is 59:1. As shown in the previous sections, this dilution does not assure compliance with applicable water quality standards.

The zone of initial dilution's dimensions are 29.2 m (95.8 ft) wide and 277.4 m (910.1 ft) long, and an area of 0.0081 km^2 (0.0031 mi^2).

- Supply Of Dilution Water [40 CFR 125.61(a)(1)(iii)]

Given an adequate diffuser design which is theoretically capable of achieving high initial dilution, the initial dilution which is actually achieved in the receiving waters can be limited by the availability of an adequate supply of dilution water.

About 0.5 km (0.3 mi) to the east and 1.0 km (0.6 mi) to the north of the proposed discharge location, there are submarine features (plateaus) that may impede the circulation process at the proposed discharge location. However, the plateaus are about 7.6m (25 ft) deep, whereas the discharge location is about 14m (46 ft) deep. Since the height of these features relative to their distance from the proposed discharge location is small (ratios of 0.013 and 0.0065, respectively) they are not expected to have an adverse impact on the dilution process.

- Transport And Dispersion Of Diluted Wastewater And Particulates [40 CFR 125.61(a)(1)(iv)]

Accumulation of suspended (settleable) solids in and beyond the vicinity of the discharge can have adverse effects on water usage and biological communities. 40 CFR 125.61(a)(1)(iv) requires that following initial dilution, transport and dispersion of the diluted wastewater and particulates must assure that water use areas and areas of biological sensitivity are not adversely affected.

The New Bedford proposed discharge is situated in the estuarine water of Buzzards Bay, an elongated body of water approximately 56 km (34.8 mi) in length and 19.5 km (12.1 mi) wide at its greatest diameter, which opens to the sea at its south end. Mean tidal speed near the proposed outfall at a 9 m (29.5 ft) depth is about 10 cm/s (0.33 ft/s) (TER, fig. 19).

The estuarine features of the Bay promote net landward motion along the bottom and net seaward motion at the surface. The low freshwater inflow to the estuary results in a long residence time and containment of wastewater particles in the bay for long periods of time.

The applicant calculated a maximum solids deposition depth (TER, Figure 16; values corrected to $g/m^2/yr$); a maximum rate of 513 $g/m^2/yr$ results, based on 100 percent settling of solids and an MER of 19,100 kg/day (42,100 lb/day). The TER demonstrates that the applicant's MER is based on an incorrect flow rate and is too high. Using a calculation based on 50 percent settling of solids (normally associated with primary effluent) and a longshore and cross-contour current distribution of 10cm/s and 3cm/s, respectively, Tetra Tech (letter dated April 2, 1982: Summers to Lorenzen) recalculates the deposition rates. With the post- 1986 MER of 5,600 kg/day (12,300 lb/day), a deposition rate of 120 $g/m^2/yr$ encloses an area of 0.94 km^2 (0.36 mi^2). This distribution is relatively constant near the discharge and is therefore representative of the rate within the ZID. The areas enclosed by the 105 and 60 $g/m^2/yr$ rate are 5 km^2 (1.9 mi^2) and 25 km^2 (9.7 mi^2), respectively.

The relocation and greater depth of the proposed outfall, upgrading of the treatment level, and the addition of a diffuser will result in the initial dilution and dispersion being greater at the proposed outfall than at the existing outfall. However, because of the semi-enclosed nature of Buzzards Bay, the relatively slow tidal currents and the absence of significant fresh water inflow which would promote flushing, pollutants discharged at the proposed outfall will

remain in the system for weeks and are likely to recirculate in the system. The applicant's current studies, the estuarine circulation (net motion landward along the bottom), and up-estuary wind field also indicates poor flushing and dispersion at the proposed outfall site. Thus, the location of the proposed outfall even though farther offshore than the existing location, still does not ensure adequate transport and dispersion of the effluent.

(b) Impact of the Discharge on Public Water Supplies [40 CFR 125.61(b)]

The applicant's proposed modified discharge must allow the attainment or maintenance of water quality which assures protection of public water supplies and must not interfere with the use of planned or existing public water supplies. There are no existing or planned public water supplies in the vicinity of the proposed discharge (TER, Part B, Section 5).

(c) Biological Impact of Discharge [40 CFR 125.61(c)]

- BIP Beyond the ZID [40 CFR 125.61(c)(1)(i)]

An applicant must demonstrate that a balanced indigenous population (BIP) of shellfish, fish, and wildlife will exist in all areas beyond the ZID that might be affected by the proposed modified discharge.

The applicant conducted biological surveys for plankton (phytoplankton and zooplankton), intertidal assemblages, benthic infauna, demersal fishes, and invertebrates. A bioaccumulation study was also conducted.

Plankton:

The applicant surveyed phytoplankton at five stations in the vicinity of the existing and proposed discharges and at one reference station, in August, 1979. Species presence was compared among sampling stations by measures of similarity and diversity. All stations were statistically different from each other in species composition. A small (5-10 micron diameter) centric diatom, Cyclotella michiganiana, was a dominant density component of the phytoplankton at all stations. Small chrysopophyte and cryptophyte flagellates were abundant in inner and outer New Bedford Harbor, and the common diatom, Skeletonema costatum, was abundant in Nasketucket Bay (control station) inshore of West Island. Outermost stations had the greatest numbers of phytoplankton species. Species of euglenas and blue green algae occurred near the existing discharge but in small numbers. The presence of euglenas and blue greens, even in low density, indicates overenrichment of these waters.

Cell numbers (a rough estimate of phytoplankton standing crop) ranged from 8.5 thousand cells/ml near the existing discharge to 1.8 thousand cells/ml near the proposed discharge site. The phytoplankton density difference may represent a normally decreasing gradient of abundance from onshore to offshore waters. Thus the presence of euglenas and blue greens, together with the unusually small species of inshore diatoms, cryptophytes and chrysophytes indicates an influence of organic enrichment shoreward of the discharge. This influence is not so great as to lessen the phytoplanktons' function as food for filter feeding animals. Although the structure of the phytoplankton population inshore of the discharge has shifted toward smaller cells, some of which are pollution-tolerant, the 301(h) Task Force believes that the phytoplanktons' function as primary producers remains intact, in spite of considerable overenrichment from the existing discharge and other sources.

The proposed discharge is not expected to harm the phytoplankton population by creating a population composed of pollution-indicator species or a population shifted toward small sized cells because: (1) nutrients will be less due to the reduced mass emission of the existing discharge, (2) the proposed discharge is more isolated from other pollution contributions, with which the present discharge interacts additively in the inner-harbor, and (3) recruitment of a more normal population of phytoplankton into the proposed wastefield will lessen pollution effects because they will act upon a healthier starting population not previously affected by human-related pollution.

The applicant's zooplankton studies in August 1979 paralleled those of the phytoplankton studies with regard to sampling zones, times, and statistical evaluations of data. The 48 species counted in six samples indicated a diverse population of zooplankton which, unlike the phytoplankton, did not differ significantly from each other from sample to sample. Zooplankton abundance seemed greater in New Bedford Harbor than at the Nasketucket Bay control stations, although this may not represent a statistically significant difference. Zooplankton species collected were those typical of New England inshore waters during late summer. Crab larvae constituted about 10 percent of total zooplankton, and calanoid copepods accounted for another 54 percent (TER, Part B, Section 6). No other major group constituted more than 8 percent. Barnacle larvae, which are reported to be sensitive to severe pollution, occurred in abundance near the existing New Bedford discharge (TER, Part B, Section 6). Thus, as of 1979, the elevated abundance of phytoplankton does not appear to have adversely influenced their function as food as shown by the normal zooplankton population. As adverse impacts on zooplankton

resulting from the existing discharge were not found, none are expected in the vicinity of the proposed discharge, due to the proposed increased initial dilution and dispersion of the discharged and reduced mass emission of suspended solids by the proposed discharge.

Intertidal:

Rocky, intertidal assemblages directly inshore of the existing discharge and at a reference area on West Island are dominated by New England rockweed (Fucus vesiculosus) and barnacles, both constituting major cover of the rock substrate (rockweed, 20-99 percent of the plants and barnacles, 98 percent of the animals). Three distinct zones of high, middle, and low intertidal assemblages could be distinguished, but species overlap was considerable (TER, Part B, Section 6). Although species richness was similar between the New Bedford Harbor station and the Nasketucket Bay station, total density of animals on New Bedford Harbor rocks was significantly less. The density difference is most likely due to the greater density of predatory snails at the New Bedford Harbor site (TER, Part B Section 6). Rockweed was dominant, and only three taxa of red and brown encrusting algae and a species of marine lichen were identified (TER, Part B, Section 6). Thus, although density and species richness of intertidal plant and animal assemblages varied, they appear to be within the extreme range of variation expected for rocky New England shorelines. Relocation of the discharge further from rocky intertidal habitat, as the applicant proposes, would reduce slightly whatever potential might exist for adverse impacts resulting from the existing discharge.

Benthos:

The applicant's data regarding impacts of the discharge on the benthos focus on an August 1979 study of Buzzards Bay, including New Bedford Harbor and Nasketucket Bay areas. The two stations closest to the existing ZID were approximately 67m (220 ft) and 58m (518 ft) beyond the boundary of the ZID. The applicant used several stations in Nasketucket Bay as controls. Nasketucket Bay appears to be an adequate location for a control site.

There was considerable overlap in the values of certain benthic parameters between the stations nearest the ZID (B1 and B2) and the controls in Nasketucket Bay (B17 and B18). However, the mean value of density, species richness, and the Shannon-Wiener diversity index of the two stations nearest the ZID were all lower than the means of the stations in Nasketucket Bay. The values for density, species richness, and diversity at the near-ZID station group were significantly lower than those for

the other station group within New Bedford Harbor. Furthermore, the lowest values for species richness, evenness, and diversity were all found at the near-ZID stations. When all the samples were analyzed for similarity in the relative abundance of species by cluster analysis, Stations B1 and B2 formed a distinct cluster. This indicates a difference in the community structure between the near-ZID stations and those in other portions of New Bedford Harbor and Nasketucket Bay.

Two lines of evidence indicate that the altered benthos near the ZID is due to the present discharge. First, density, species richness, and diversity were lowest at the station nearest the ZID (B2, 67m from the ZID) and increase progressively to the station furthest from the ZID (B15, 582m from the ZID). The second was the occurrence of the polychaete worm, Nereis succinea, as the dominant species at near-discharge Stations B1 and B2. This polychaete was neither dominant nor subdominant at the control sites. Pearson and Rosenberg (1978) identify Nereis (=Neanthes) succinea as a pollution-tolerant species. Its occurrence as the only dominant species at the near-discharge stations is indicative of moderate to high levels of organic enrichment.

In summary, mean faunal density, species richness, and diversity were very low at the two stations nearest the existing zone of initial dilution in comparison to suitable control sites in Nasketucket Bay and in other areas of New Bedford Harbor. Finally, the pollution-tolerant polychaete, Nereis succinea, was the dominant species at the near-outfall stations. These data demonstrate that the benthic community is substantially altered at Stations B1 and B2. The altered benthos extends at least 158m (518 ft, Station B1) from the ZID but less than 582m (1910 ft, Station B15). Assuming a circular area, the altered benthos covers an area of at least 0.08 km^2 (0.03 mi^2) but less than 1.06 km^2 (0.41 mi^2). These areas are approximately ten times and thirteen times the area of the ZID, respectively. The benthic population beyond the ZID-boundary is therefore, outside the range of natural variation, shown by the dominance of a pollution-tolerant species and other indications of benthic health.

Relocation of the discharge will result in a greater transport of the effluent particles within the New Bedford Harbor-Buzzards Bay estuary. However, the poor flushing of the region means that most of the particles will continue to remain within the estuary. The net result is that a greater area of the benthos will be affected by the proposed discharge, though the deposition rate in the immediate vicinity of the proposed discharge will not be as great as near the existing discharge.

As discussed in the Transport and Dispersion section, it is predicted that the deposition rates will be 105 $g/m^2/yr$ over a 5 km^2 (1.9 mi^2) area and will be 60 $g/m^2/yr$ over a 25 km^2 (9.7 mi^2) area. At the higher rate, in an area near the discharge it is expected that total density will be altered, whereas Shannon-Wiener diversity and evenness will be depressed. Because estuarine sediments usually are naturally high in organic content and because of the limited species pool available for colonization, it is expected that this addition of high organic effluent particles will reduce species richness. Pollution-tolerant species, such as Nereis succinea will increase in abundance whereas pollution-sensitive species will decline, though they are not expected to be eliminated.

The effects of the lower deposition rate (60 $g/m^2/yr$) over the larger area will depend, in part, on the resiliency of the community and the severity of other impacts. Because of the extensive areal coverage of sewage related suspended solids deposition, it is likely that the New Bedford Harbor area presently closed to the harvest of certain shellfish (Figure 3) will continue to be affected by the proposed discharge. Thus, the proposed discharge would contribute to the degradation of the benthic community.

In summary, benthic alterations caused by the proposed discharge are expected to be similar in nature to those caused by the present discharge, though they are not expected to be as severe. However, these alterations will extend over a greater area. The higher deposition rate (>100 $g/m^2/yr$) which is expected to result in a direct substantial modification of the benthos will cover an area over 600 times the area of the ZID. The lower deposition rate (>60 $g/m^2/yr$), although not as severe, will be sufficient to modify sensitive benthic communities or contribute to the degradation of presently stressed communities and will cover an area about 3,000 times the area of the ZID. Because of the extensive area of the impact, it is probable that the benthic alterations will affect other components of the ecosystem. Possible ecosystem impacts include alterations in the quantity and quality of prey species for fishes, increased benthic oxygen demand (e.g., Smith et al., 1973) and increased fluxes of nutrients and heavy metals from the sediment (e.g., Aller and Benninger, 1981).

Fisheries:

The applicant's BIP comparison for fishes included a one-day August otter trawl survey at four stations (i.e., near-ZID, beyond-ZID, and two reference sites) and a discussion of estuarine fishes endemic to the Slocum River estuary south of New Bedford. Although only six pelagic fish species were represented in the applicant's trawl survey, four of the

species collected are considered to be among the ten most abundant species in southeastern coastal Massachusetts' waters. Benthic and demersal fishes were not collected; therefore, the applicant's otter trawl survey may not have examined the bottom. Winter flounder, usually abundant in July and August, were notably absent from fish samples collected. From personal communication (Black and MacPhee, USEPA) these flatfishes are ordinarily abundant in New Bedford Harbor near the existing discharge and other areas of Buzzards Bay and should have occurred in the applicant's trawls at the proposed discharge location and reference sites. Absence of flounder in the applicant's bottom trawl survey indicates that methods or techniques employed were probably inadequate, as discussed above, since bottom fish such as flounder are normally abundant in this area during this time of year.

Conclusions about species composition, abundance, dominance, and diversity of fish communities in the vicinity of these existing and proposed discharges remain tenuous because, as the applicant states, "based on limited fish data no conclusions can be drawn in regard to species at the various stations." The applicant did note that scup were common to all four trawl stations and that the largest density of scup occurred at the existing discharge. The applicant noted that scup were the dominant finfish species collected in otter trawls, although demersal or benthic fishes may not have been examined. The largest density occurred at the existing discharge location. As an explanation the applicant concluded that these fishes were either caught by chance or were attracted to the existing discharge to feed on discharged particulate matter and/or associated benthic organisms. Polychaete worms dominate the benthic community near the ZID of the existing discharge, therefore based on known feeding behavior of scup it is reasonable to assume that they were foraging on these annelid worms. However, attraction of scup does not constitute an adverse impact since they are not considered a nuisance species of fish.

Sixteen invertebrate species were collected during the applicant's shellfish survey. The dominant bivalve species was the hard-shelled clam followed by the false quahog and oyster, while the fourth most abundant species collected was the spider crab. Among sites there was considerable variation in species composition and abundance that the applicant attributed to natural variation, substrate preferences, and commercial fishing pressure. The applicant contends that these factors obscured station comparisons and possible impacts that might be attributed to the existing discharge. Even considering these problems, the available data indicate that shellfish species collected by the applicant were typical of those expected in New England coastal waters.

Shellfish closures are now in effect in New Bedford Harbor/Buzzards Bay as enforced by the Massachusetts Department of Public Health. The area of shellfish closure areas was expanded because of high coliform counts. The basis for extension of the closed area by the Massachusetts Department of Environmental Quality Engineering (DEQE) in 1971 was attributed by DEQE, (according to the applicant), to Acushnet River pollution, discharges from combined sewer overflows in New Bedford and Fairhaven wastewater outfalls, and poor reliability of treatment plants.

Based on the following information the existing discharge does not appear to serve as a disease epicenter for fish and shellfish. Personnel of the Massachusetts Division of Marine Fisheries have been conducting studies on fisheries of New Bedford Harbor to determine disease prevalence, but have not found any external lesions (i.e., fin rot, papillomas, or other external anomalies) or other anomalies associated with fishes, shellfish, or lobsters. According to the applicant, there was no apparent disease associated with collected pelagic fish specimens, nor was there any previously recorded incidence of disease in New Bedford Harbor. The applicant's statements were supported by personal communications (Wong, USEPA REG.1, Reback and Hickey, Massachusetts Division of Marine Fisheries).

The applicant has been discharging toxic and bioaccumulative pollutants (such as PCBs and metals) to the immediate area and beyond that may result in adverse impacts on fish attracted to the vicinity. As discussed above, finrot, papillomas and other external anomalies were not visible in specimens collected by the applicant from New Bedford Harbor/Buzzards Bay. There is a potential for internal lesions in fish and shellfish due to toxic effects of heavy metals and other inorganic and organic materials discharged from sewage discharges. While microscopic examination of tissues following field investigations at New Bedford are not conducted on a routine basis, adult winter flounder collected from New Bedford Harbor have liver pathology and gallbladder anomalies (Black, USEPA). The applicant cited mass mortalities of menhaden that occurred deep inside the New Bedford inner harbor during 1976, 1977, and 1978. Gardner (USEPA, Personal Communication) conducted a field investigation and histological evaluation of menhaden from the 1977 mass mortality referenced by the applicant. Pathology associated with these menhaden was similar to that observed in menhaden from two other estuarine locations in southern New England, but was much more severe. These lesions generally involve the sensory system and may be related to heavy metal contamination, based on laboratory and field studies (Gardner, 1975). Menhaden, the most economically important fishery on the Atlantic coast are very sensitive to temperature, DO effects (including low DO or supersaturation), and apparently toxic

pollutants such as heavy metals (Gardner, 1975). The existing outfall discharges large quantities of heavy metals and may have contributed to observed pathology and mass mortality of menhaden surveyed in New Bedford Harbor.

In summary, the applicant concluded that there will not be any large scale adverse impacts on the fish community associated with the proposed discharge. The 301(h) Task Force does not believe that there is sufficient information to determine the validity of this conclusion. Although the fish fauna in New Bedford Harbor/Buzzards Bay is diverse and similar to other New England estuaries, nothing is known about density or relative abundance of the species at the existing or proposed discharge.

Sufficient data is available, however to determine the serious contamination of New Bedford Harbor/Buzzards Bay by toxic heavy metals, PCBs, and other pollutants. Although external anomalies and diseases in fish and shellfish were not apparent, internal pathological lesions and mass mortalities of fish possibly attributable to toxic metals did occur. Further, the area of the discharge was closed to the taking of bottom feeding fish and lobsters by the Massachusetts Department of Environmental Quality Engineering in 1979 due to PCB contamination (TER, Part B, Section 6). As discussed in the following subsection on Bioaccumulation and Toxic Pollutants, the concentrations of PCBs and other toxic pollutants in the effluent and in the sediment around the discharge indicate that the existing discharge has contributed to the severe New Bedford Harbor pollution and contamination of fish and shellfish. The discharge will continue to contribute to coliform and toxic pollution of shellfish and fish at the proposed site. This may result in an extension of the polluted area and an extension of the area closed to fisheries.

Bioaccumulation and Toxic Pollutants:

Toxic pollutants and pesticides can exert a number of adverse effects on marine organisms. At high exposures, death results, thereby causing a direct decrease in the population. At lower exposures, organisms may avoid contaminated areas. Low concentrations also can reduce a species' reproductive potential, cause or increase the potential for disease and impair predator avoidance behavior. These effects of sublethal chronic concentrations can significantly reduce the abundance and distribution of the impacted species. Marine organisms also accumulate many toxic pollutants to high levels from the water, sediment, and food, which can result in the impacts mentioned above. Additionally, certain toxic pollutants are transferred through the food web, ending up in recreationally and commercially important species. Consumption of these

fishes and shellfishes can lead to the uptake of toxic pollutants by humans.

Industrial wastes constitute 21 percent of the existing discharge flow and are predicted to constitute 22 percent of the discharge flow in 1988. The applicant reported a total of 57 organic compounds, 13 metals and 6 pesticides from the EPA list of 129 priority pollutants and six pesticides; they include mercury, chromium, PCBs, copper, endosulfan, cadmium, selenium, and cyanide.

EPA recommended Water Quality Criteria (WQC) provide a useful guide for evaluating whether toxic priority pollutants are present in seawater in concentrations that adversely affect biota and human health (45 Fed. Reg. 79318, November 28, 1980). WQC are based on the available scientific data on the effects of pollutants on public health and welfare, aquatic life, and recreation. They establish numerical values which indicate the concentrations of pollutants in water which will generally ensure water quality adequate to support the pertinent water use. The criteria represent a reasonable estimate of the pollutant concentrations that generally will provide adequate protection to health and the environment. However, the criteria concentrations may need to be adjusted on a local basis to reflect local environmental conditions and human exposure patterns.

Based on the applicant's chemical analysis of effluent, five toxic priority pollutants (PCBs, endosulfan, mercury, cyanide and copper) shown in the table below would exceed EPA WQC, after proposed initial dilution (59:1) (TER, Part C, Section 3; TER, Part E). Actual initial dilution at the existing discharge (5:1) is less than the proposed initial dilution; therefore concentrations of priority pollutants released into the receiving waters of the existing discharge would be higher.

Pollutants In Effluent	Factor Greater than EPA WQC
Cyanide	16.5x
PCBs	13.3x
Endosulfan	2.2x
Mercury	1.6x
Copper	1.3x

The applicant conducted water column, sediment, and tissue analyses of toxic pollutants within or near the ZID of the existing discharge. Water samples collected from within or near the existing ZID (Station 1 and 2; TER, Part E) had concentrations of toxic pollutants that exceeded EPA Water Quality Criteria by the following factors:

Pollutants In the Water Column	Factor Greater than EPA WQC
PCBs	16.6x
Cyanide	16.5x
Mercury	14.4x
Cadmium	11.1x
Chromium[5/]	2.2x
Selenium	1.2x

Beyond impacts exerted by concentrations in excess of WQC, composite effects of two or more priority pollutants may cause long-term adverse impacts individually or in combination (synergistic effects). In addition, priority pollutants released in the receiving water below WQC may accumulate in prey species at levels which are not toxic to those species but which may biomagnify to adverse levels in predator species. Analyses of priority pollutant concentrations in the water column, sediments, and the biota and indications of impacts such as increased disease incidence or extreme effects on one level of the ecosystem are used when available, to make predictions about these toxic impacts.

The applicant studied sediment and tissue concentrations in New Bedford Harbor in 1979, apparently utilizing the same stations as used for the benthos survey (TER, Part B, Section 6). The applicant reported that metal concentrations of sediment were generally highest near the ZID. The ranges of sediment concentrations of chromium, mercury, nickel, zinc, lead, and cadmium from the ZID and near ZID sites exceeded the values for control areas, outer Harbor sites and the proposed outfall site (TER, Part B, Section 6). Copper concentrations near the outfall exceeded control site values as well (Application, Table XVII-15). Of these compounds, mercury and copper in the effluent exceeded WQC after critical initial dilution.

The applicant acknowledges that "analyses conducted on shellfish tissues for trace metals and organics show that bioaccumulation is occurring" (TER, Part B, Section 7). The applicant's studies indicate that several metals (e.g., copper, nickel, and zinc) occurred at higher concentrations in shellfish samples near the outfall when compared to the surrounding area (TER, Table 34). Conclusions based on the applicant's tissue studies are difficult to reach because of

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5/The valence state of chromium in the water column is not known. The water quality criterion is based on hexavalent chromium.

incomplete collection and/or presentation of bioaccumulation information. The applicant did not present information on types of species and tissues sampled. Different species (and tissues) accumulate toxics at different rates and concentrations, therefore inappropriate sampling may greatly skew bioaccumulation results. Disregarding possible sampling inconsistencies, it appears that bioaccumulation of metals by shellfish is occurring in the area. It is likely that the discharge is contributing incrementally to the problem.

Endosulfan in the applicant's wet-weather effluent exceeded EPA Water Quality Criteria by 2.2 times after proposed initial dilution. However, water or tissue data on endosulfan were not presented. Endosulfan is a chlorinated pesticide with a broad range of toxicity to vertebrates and invertebrates. It bioaccumulates in shrimp, finfish, crab, and mussel tissues with bioaccumulation factors as great as 1000X over water concentrations reported in marine organisms (USEPA, 1980).

PCBs (including PCB-1254) were reported in the effluent at concentrations exceeding EPA Water Quality Criteria by 13.3 times, after the proposed critical initial dilution. The PCB-1254 concentrations, reported by the applicant in the water column in the proximity of the ZID, also exceeded this criterion, by 17 times.

Sediment concentrations of PCB from the near-ZID station were approximately 100 times greater than those of three New Bedford Harbor sites. As the Harbor sites are close to several other known point sources of PCB, high sediment concentrations near the discharge suggests that the existing discharge is a significant source of PCB contamination in New Bedford Harbor (TER, Part B, Section 6). Kolek and Cuervals (1981) of the Massachusetts Division of Marine Fisheries conclude that "The presence of PCBs in the sewage effluent and sediment adjacent to the [New Bedford] outfall pipe indicates that this is also a source of contamination..." (TER, Part B, Section 6).

The applicant reported a near-ZID PCB-1254 concentration in tissue of 0.001 mg/wet kg. The applicant did not report analytical chemical data for PCB-1254 in tissue samples collected from control areas. The PCB value reported by the applicant may not have been representative, as it was 2-3 times lower than tissue values reported from numerous finfish, lobsters, crabs, and shellfish samples collected from nearby locations in other studies (Commonwealth of Massachusetts, CZM, 1978). Many of these tissue concentrations exceeded FDA Action levels.

PCB contamination of animals living in New Bedford Harbor has resulted in closures imposed by the Massachusetts Department of

Public Health (MDPH) on the harvest of shellfish, lobsters, and fish. The existing discharge is located in an area now closed to the taking of bottom feeding fish and lobsters, while the inner harbor, to the north, is closed to shellfish harvest due to PCB contamination (Figure 3). The high concentrations of PCB in the effluent and high sediment concentrations of PCB in the outfall vicinity indicate that the existing discharge is partially responsible for PCB contamination and contributes to the fishery closures. The site intended for the proposed, relocated discharge is in the vicinity but outside of the boundary for the area closed by the MDPH to lobster harvesting (Area III). Relocation of the discharge may result in extension of the closure boundaries to incorporate the new discharge area, further restricting additional waters to the harvest and consumption of certain marine animals.

In conclusion, the existing discharge is contributing to the adverse bioaccumulation occurring in New Bedford Harbor, as evidenced by concentrations of toxic pollutants in the effluent, receiving water, sediment, and biota. Pollution, particularly PCB contamination, has resulted in severe impacts on fisheries in the area, including closures to harvesting of fish, shellfish, and lobster. In fact, due to the severe problems of PCB pollution, New Bedford Harbor was added to the list of additional Superfund Priority sites (July 23, 1982) for remedial action addressing hazards related to hazardous waste disposal sites. Proposed improvements (including relocation, extension of the outfall, addition of a diffuser and reduction of MER) will reduce the applicant's contribution to the adverse bioaccumulation occurring in New Bedford Harbor. An effective toxics control program would further lower most of the pollutants below Water Quality Criteria, except for PCBs. As the applicant has not identified the source of the PCBs or defined a control plan for this toxic pollutant, the discharge is expected to continue to contribute PCBs incrementally to New Bedford Harbor. In addition, there is a strong potential for contamination due to the discharging of PCBs of the area around the relocated proposed discharge.

BIP Beyond the ZID Summary:

In summary, a balanced indigenous population (BIP) does not presently exist beyond the zone of initial dilution (ZID) of the existing discharge. Effects of organic enrichment have shifted the phytoplankton toward smaller cells, some of which are known pollution-indicators. Benthic community structure and function have been substantially altered beyond the ZID and are outside of the natural range of variability. It is highly probable that toxics in the effluent are contributing to bioaccumulation by organisms in the area. Adverse impacts including fish pathology and fish kills are occurring in the

area of New Bedford Harbor. The existing discharge has contributed to pollution of shellfish and fishes by toxic pollutants (including PCB) and coliform bacteria.

After implementation of the improvements delineated by the applicant (reduction in mass emissions, improved separation of storm water, extension of the outfall, and addition of a diffuser), the phytoplankton effects should be lessened. Benthic community impacts will also be less due to the proposed decrease in the solids mass emission rate (MER) and improved dilution, but the benthos will still be modified over an extensive area beyond the ZID, outside the range of natural variability. Based on the applicant's proposal, the discharge will continue to contribute to pollution of shellfish and fishes, extending the area of adverse pollutant impacts on organisms, and possibly extending the area of fishery restrictions.

In conclusion, analysis of the combined multi-community ecosystem, including expected adverse indirect community impacts such as bioaccumulation, indicates that a balanced indigenous population (BIP) of shellfish, fish, and wildlife did not exist at the time of application and will also not be maintained by the proposed modified discharge.

- Absence of Extreme Adverse Impacts Within The ZID [40 CFR 125.61(c)(1)(ii)]

Conditions within the ZID must not contribute to extreme adverse biological impacts within the ZID or contribute to adverse impacts beyond the ZID.

Extreme adverse biological impacts go beyond the issue of the range of natural variability. To be considered extremely adverse, major ecosystem impacts would be observed such as the presence of disease epicenters or the destruction of distinctive habitats of limited distribution, or the stimulation of phytoplankton blooms which have far-reaching adverse effects.

Impacts such as these have not occurred within the ZID of the existing discharge and are not expected to occur after the proposed improvements are implemented. However, there is not presently enough information available to determine if extreme adverse impacts related to PCB contamination are, in fact, occurring within the ZID or are likely to occur at the proposed discharge site.

- Additional Biological Requirements for Saline Estuarine Dischargers [40 CFR 125.61(c)(1)(iii)]

o Benthic Restriction Within ZID [40 CFR 125.61(c)(1)(iii)(A)]

Benthic populations within the ZID of the proposed modified discharge must not differ substantially from the benthic populations which exist immediately beyond the boundary of the ZID.

The benthos outside the ZID has been highly modified by the present discharge of 11,600 kg/day of suspended solids and the toxic substances associated with these solids. Based on these conditions and in the absence of other specific data, it is predicted that the benthos within the present ZID has a reduced density, diversity, species richness, and evenness, and is probably dominated by pollution-tolerant species. The type and magnitude of these alterations are sufficiently adverse to describe the benthos as being substantially altered.

The proposed discharge would have a solids MER of 5600 kg/day resulting in a seabed accumulation of about 122 $g/m^2/yr$ within the ZID. This deposition rate is relatively constant near the ZID thus similar impacts to the within-ZID benthos are expected as beyond the ZID. As described in the BIP Beyond the ZID section, addition of this amount of effluent solids would alter total density, decrease diversity, species richness, and evenness; cause increases in pollution-tolerant species; and alter species composition of the community. Besides these structural changes, certain functional aspects of the proposed within-ZID benthos would be impacted. Likely impacts on function include an increase in benthic oxygen demand and an increased flux of nutrients and heavy metals from the sediment to the water, as found near other sewage outfalls (Smith et al., 1973; Aller and Benninger, 1981). These projected changes in the structure and function of the benthos are substantial when compared to the unimpacted benthos. These alterations would reduce the amount of habitat available for certain estuarine benthic species and the amount of food available for certain migratory and demersal fishes. Additionally such within-ZID benthic impacts are a clear indication that certain components of the estuarine ecosystem would be adversely impacted by the proposed discharge.

o Migratory Restriction Within ZID [40 CFR 125.61(c)(1)(iii)(B)]

The proposed modified discharge must not interfere with estuarine migratory pathways within the ZID.

Migratory fishes are found in New Bedford Harbor. The applicant noted that alewives represent an anadromous species that annually migrates up the Acushnet River via the Harbor. Further, the applicant noted that popular migratory sport fishes, such as bluefish, occur in outer New Bedford Harbor during certain times of the year. There is no evidence that migratory routes are currently impeded by the existing discharge. Therefore, it is not likely that they would be restricted by the proposed discharge.

- o Bioaccumulation Restriction Within ZID [40 CFR 125.61(c)(1)(iii)(C)]

The proposed modified discharge must not result in the accumulation of toxics at levels which exert adverse effects on the biota within the ZID.

The existing discharge is contributing to the adverse bioaccumulation occurring in New Bedford Harbor. Several toxic priority pollutants were detected in the effluent, after proposed initial dilution, at concentrations exceeding EPA Water Quality Criteria. These include mercury, cyanide, copper, PCBs, and endosulfan (TER, Part E; Part C, Section 3). PCBs were detected in the effluent at levels 13.3 times the EPA Water Quality Critera. Cadmium, chromium[6/], cyanide, mercury, selenium and PCBs exceed EPA Water Quality Criteria in the receiving water, within or near the ZID of the existing discharge (TER, Part E). Pollution in New Bedford Harbor, including PCB contamination, has resulted in the closure to commercial and recreational fisheries for shellfish, crustaceans and bottom feeding fish. Although the modified discharge will result in a lower MER and increased initial dilution, the resultant effluent will still contribute PCBs and other toxics to the environment. An effective toxics control program would be essential to reduce high concentrations of toxic pollutants discharged through the applicant's outfall. However, the applicant has not identified the source of PCBs or defined a plan of control for this toxic pollutant. Thererefore, even with the implementation of the toxics control program and improvements proposed by the applicant, it is expected that PCB's wil continue to be discharged in adverse concentrations by the proposed discharge.

The greatest potential for the proposed discharge's contribution to the adverse bioaccumulation in the receiving

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6/The water quality criterion is based on hexavalent chromium. The valence state of chromium in the effluent and the receiving water is unknown.

water will be in the vicinity of the proposed discharge. Therefore, it is likely that toxics will accumulate at adverse levels within the zone of initial dillution (ZID) of the proposed discharge.

- Water Quality Affecting BIP [40 CFR 125.61(c)(1)(iv)]

The proposed modified discharge must comply with the applicable State water quality standards or other requirements adopted to attain or maintain water quality which provides for the protection of fish, shellfish and wildlife.

The Commonwealth of Massachusetts has designated the waters that receive the New Bedford treatment plant discharge as Class SA. Massachusetts waters assigned to Class SA are used for protection and propagation of fish, other aquatic life, and wildlife, for primary and secondary contact recreation, and for shellfish harvesting without depuration (cleansing) in approved areas.

The water quality standard for Class SA waters requires that the receiving water pH "Shall be in the range of 6.5-8.5 standard units and not more than 0.2 units outside of the naturally occurring range." Discharge monitoring reports for January 1978, through February 1981, show a range of effluent pH from 3.3 to 9.9 (TER, Part B, Section 3). Ambient data from three stations near the proposed discharge location taken November 1975, through April 1975, show a range of pH 6.6 to 10.1 (TER, Part B, Section 3). The reason for the high pH is unknown. The applicant did not test mixtures of effluent and seawater for pH because low effluent pH values did not occur during the time when the application was prepared (TER, Part B, Section 3). The effluent pH limitations in the application are 6.0 and 9.0 (TER, Part A, Section 2), and thus are within the range defined as secondary treatment.

Tetra Tech's pH model was used to predict whether the extreme pH conditions would violate the water quality standard (TER, Part B, Section 3). With an initial dilution of 59:1 and an ambient pH of 8.5, an effluent pH of 9.9 would not violate the standard. If the ambient pH was 6.6 when the effluent pH was 3.3, there would be a violation of the standard. However, with an effective pretreatment program and/or pH adjustment, the State pH standard is not likely to be violated by the proposed discharge.

The proposed discharge is expected to violate the Commonwealth of Massachusetts water quality standards for dissolved oxygen but not violate water quality standards for suspended solids, as discussed in the State Water Quality Standards section.

The Commonwealth of Massachusetts Water Quality Standards provide that pollutants must be regulated if they "exceed the recommended limits on the most sensitive receiving water use" or "injure, are toxic to, or produce adverse physiological or behavioral responses in human or aquatic life." (Regulation 3.4). Regulation 3.2 further provides that EPA Water Quality Criteria (WQC) are to be used to interpret the narrative criteria in Regulation 3.4 and as guidance in establishing case-by-case discharge limits for pollutants not specifically listed in the water quality standards but which are generally included in Regulation 3.4.

As explained in the section on Bioaccumulation and Toxic Pollutants, PCBs, mercury, copper, endosulfan, and cyanide exceed the saltwater quality criteria after critical initial dilution. PCBs are likely to continue to exceed water quality criteria even after proposed improvements. Accordingly the 301(h) Task Force concludes that the proposed discharge would not satisfy the narrative standard in Regulation 3.4. Massachusetts has not yet given its opinion on this issue.

As discussed in the Improved Discharge section, the proposed discharge will not be adequate to attain water quality suitable for the protection of the balanced indigenous population and other beneficial uses in the discharge area.

(d) Impact of Discharge on Recreational Activities [40 CFR 125.61(d)]

The applicant's proposed modified discharge must allow for the attainment or maintenance of that water quality which supports recreational activities beyond the ZID.

Waters in the New Bedford area support numerous recreational activities that include sportfishing, shellfishing, boating, swimming, wading, and picnicking.

Pollution has severely impacted fisheries in the New Bedford Harbor. Coliform contamination of shellfish has resulted in shellfish closures. This contamination has been attributed, in part, to the New Bedford discharge (see BIP Beyond the ZID section). Improved treatment and adequate disinfection of the proposed effluent should reduce but not completely eliminate the applicant's contribution to this problem.

PCB contamination (also discussed in the BIP Beyond the ZID section) has resulted in PCB bioaccumulation in shellfish, lobsters, crabs and fish. Fishery closures in New Bedford Harbor have resulted due to the high PCB contamination. The

proposed discharge could result in direct and indirect adverse impacts on fisheries through extension of the pollutant impacted area. Relocation of the discharge could also result in extension of the fishery closure boundaries to incorporate the new discharge area. Thus, PCBs in the proposed effluent are expected to contribute to a severe fishery problem, which will not allow for attainment of recreational activities beyond the ZID.

(e) Improved Discharge Effect [40 CFR 125.61(e)]

Where the proposed modified discharge is based upon improvements to the existing discharge, the applicant must demonstrate that the proposed improved discharge will eliminate, reduce, or otherwise relieve any adverse impacts previously identified which might be caused by the existing discharge.

The applicant's proposed improvements include construction of an extended outfall and diffuser and proposed reduction of mass emission of solids. Critical initial dilution will be 59:1; the depth of the outfall will be greater and more effective dispersion of the effluent should occur. Nevertheless, as discussed in the Transport and Dispersion section, the estuarine circulation and long residence time of particulates within the embayment does not ensure that efficient dispersion of particulates will occur although some advantage over the existing outfall would accrue. The reason for this is that estuaries, in general, act as traps for particulates whereas open ocean discharge allows for considerable transport and dispersion. In this area, the problems are particularly severe since the applicant is proposing to discharge into an area already heavily impacted by pollution.

The proposed improvements will reduce but not eliminate the existing phytoplankton nutrient enrichment. Zooplankton do not appear to be impacted by the existing discharge. Therefore adverse impacts on zooplankton populations due to the proposed discharge are not expected. Relocation of the discharge further from rocky intertidal habitats will reduce the potential for adverse impacts resulting from the discharge.

As the mass emission rate (MER) the proposed discharge is expected to be reduced, impacts on the benthic community should be reduced. However, the benthos will be adversely impacted by the proposed relocated discharge to such an extent that the benthic community will lie outside of the natural range of variability. This is discussed more fully in the BIP Beyond the ZID Section. Additionally the structure and function of the benthos within the proposed ZID will be substantially modified compared to control conditions.

As discussed in the BIP Beyond the ZID section, the discharge is releasing high concentrations of toxic metals. Therefore it is likely that it is contributing to internal pathology and mass mortality of menhaden in New Bedford Harbor. Further, fish, shellfish, and lobster contamination by PCBs, other toxic pollutants and coliform bacteria have caused commercial and recreational fishery restrictions to be imposed in New Bedford Harbor. Even after implemenatation of improvements proposed by the applicant, it is expected that the discharge will continue to contribute to the pollution of New Bedford Harbor. An effective toxics control program would be necessary in addition, to reduce the adverse contribution of metals to the environment from the discharge. However, even after implementation of the toxics control program and improvement's proposed by the applicant, it is still expected that PCBs will continue to be discharged, contributing to the New Bedford Harbor PCB problem. In addition, PCB contamination is likely to be extended into the area of the proposed discharge. Adverse impacts within the ZID related to PCB contamination are also likely.

In conclusion, the proposed modified discharge will not eliminate, reduce or otherwise alleviate adverse impacts of the existing discharge as required by 40 CFR 125.61(e). The Commonwealth of Massachusetts dissolved oxygen water quality standard will not be met. Recreational activities, such as fishing, will be adversely affected and adverse benthic community alterations will not be eliminated by the proposed discharge.

3. Establishment Of Monitoring Programs [Section 301(h)(3), 40 CFR 125.62[1/]]

Under 40 CFR 125.62, which implements Section 301(h)(3), the applicant must have a biological monitoring program, a program for monitoring compliance with State water quality standards, a toxics control monitoring program, and the capability to implement these programs upon issuance of a 301(h) modified NPDES Permit. In accordance with 40 CFR 125.62(a)(4), the applicant's monitoring programs are subject to revision as may be required by EPA.

A detailed assessment of the applicant's proposed monitoring program is not included as part of this document in view of the findings herein that the proposed discharge does not meet the requirements of Section 301(h) and 40 CFR Part 125 in several other important aspects.

1/ This section was misnumbered and incorrectly appears as a second section 40 CFR 125.61 in the final regulations.

In summary, the proposed program, comprised of the biological, water quality, and toxics control monitoring components addressed the major issues, however, each program is deficient in several areas. A point-by-point discussion of these deficiencies and the entire monitoring program can be found in Part C, Sections 1-3 of the Technical Evaluation Report.

4. Impact of Modified Discharge On Other Point And Nonpoint Sources [Section 301(h)(4), 40 CFR 125.63]

Under 40 CFR 125.63, which implements Section 301(h)(4), the applicant's proposed modified discharge must not result in the imposition of additional treatment requirements on any other point or nonpoint source.

The Commonwealth of Massachusetts in a letter of September 23, 1982, stated that it did not believe additional treatment requirements will result, since other sources are not in close proximity to the applicant's proposed discharge. In light of this letter, the 301(h) Task Force concludes that impacts on other sources are unlikely.

5. Enforcement Of Applicable Pretreatment Requirements [Section 301(h)(5), 40 CFR 125.64(a) through (c)]

Under 40 CFR 125.64(a) through (c), which implement Section 301(h)(5), the applicant must provide a chemical analysis of its effluent for toxic pollutants, submit an analysis of the sources of toxics, and, where industrial sources of toxic pollutants are known or suspected, have an industrial pretreatment program capable of enforcing all applicable promulgated pretreatment standards. Pursuant to 40 CFR 125.64(c)(1)(iii), this program is subject to revision as may be required by EPA.

A detailed assessment of the applicant's toxic control program is not included as part of this document in view of the findings herein that the discharge does not meet the requirements of Section 301(h) and 40 CFR Part 125 in several other important aspects.

In summary, the proposed program comprising the chemical analysis, industrial pretreatment, and toxic source identification components addresses the major issues. However, each component is deficient in several respects. A point-by-point discussion of these deficiencies and the entire program can be found in Part E, Sections 1-2 of the Technical Evaluation Report.

6. Schedule Of Activities To Eliminate Entrance Of Toxics From Nonindustrial Sources [Section 301(h)(6), 40 CFR 125.64(d)]

Under 40 CFR 125.64(d), which implements Section 301(h)(6), the applicant must have a schedule of activities designed to eliminate the entrance of toxic substances from nonindustrial sources, to the extent practicable, which will be implemented no later than 18 months after issuance of the 301(h) modified NPDES Permit. In accordance with 40 CFR 125.64(d)(1)(ii), this nonindustrial toxics source control schedule is subject to revision as may be required by EPA.

A detailed assessment of the applicant's schedule of activities to control nonindustrial sources of toxics is not included as part of this document in view of the findings herein that the discharge does not meet the requirements of Section 301(h) and 40 CFR Part 125 in several other important respects. Deficiencies exist, including overall planning, source control and the entire schedule of activities. A discussion of these deficiencies and the entire schedule of activities can be found in Part E, Sections 1 and 3 of the Technical Evaluation Report.

7. Effluent Volume and Mass Emissions [Section 301(h)(7), 40 CFR 125.65]

Under 40 CFR 125.65, which implements section 301(h)(7), the applicant's proposed modified discharge may not increase above the amount specified in the 301(h) modified NPDES Permit. The applicant has furnished data projecting its future discharge volume and mass emissions.

The applicant presents projections of wastewater flow, BOD and suspended solids for the year 1988. The projected flow is 29.4 mgd, with loadings of 23,800 lbs/day of biochemical oxygen demand and 12,300 lbs/day of suspended solids.

The City of New Bedford has a total of thirty combined sewer overflows in its system. The City has a program to maintain, clean and limit overflows. A proposed study will provide recommendations for improvements to further limit these discharges.

STATE SECONDARY TREATMENT REQUIREMENTS [40 CFR 125.59(b)(4)]

40 CFR 125.59(b)(4) provides that a 301(h) modified NPDES permit may not be issued if State or local law requires secondary treatment. The applicant has certified that neither the Commonwealth of Massachusetts nor local law prohibit less-than-secondary treatment for municipal wastewater discharges to the marine environment.

Primary treatment plus disinfection is the minimum treatment requirement according to the Massachusetts water quality standards. Massachusetts water quality standards also state that "minimum treatment requirements will be increased where necessary to satisfy other state and federal laws and regulations or to achieve the water quality assigned in these regulations, whichever is the most stringent."

STATE COASTAL ZONE MANAGEMENT PROGRAM [40 CFR 125.59(b)(5)(i)]

40 CFR 125.59(b)(5)(i) provides that when a proposed discharge is located in an area covered by an approved State Coastal Zone Management Program pursuant to the Coastal Zone Management Act, 16 U.S.C. 1451 et. seq., a 301(h) modified NPDES permit may not be issued unless the proposed discharge is certified to comply with such program.

The applicant states that the proposed discharge would be located in an area which is under jurisdiction of the Commonwealth of Massachusetts Regulations on Ocean Sactuaries, which has been approved under the Coastal Zone Management Act of 1972, and indicates in its application that it believes its proposal is consistent with this plan. However, in a letter of March 11, 1980, the Commonwealth of Massachusetts, Executive Office of Environmental Affairs, states the application contains insufficient information, particularly with regard to water quality standards compliance, to enable a review of consistency by that office. Resolution of consistency would be necessary before an effective 301(h) modified NPDES permit could be issued.

MARINE AND ESTUARINE SANCTUARIES [40 CFR 125.59(b)(5)(iii)]

40 CFR 125.59(b)(5)(iii) provides that when the proposed discharge is located in a marine or estuarine sanctuary designated pursuant to the Marine Protection, Research and Sanctuaries Act, 16 U.S.C. Section 1431 et. seq., or the Coastal Zone Management Act, 16 U.S.C. Section 1451 et. seq., a 301(h) modified NPDES permit may not be issued if the Secretary of Commerce denies certification.

The applicant states that its proposed discharge is not located in any designated marine or estuarine sanctuary. In a letter of August 11, 1980, M. Glazer, Assistant Administrator, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, verifies that the proposed discharge is not located in any designated marine or estuarine sanctuary.

ENDANGERED OR THREATENED SPECIES [40 CFR 125.59(b)(5)(ii)]

40 CFR 125.59(b)(5)(ii) provides that a 301(h) modified NPDES Permit may not be issued if the proposed discharge will adversely impact threatened or endangered species or critical habitat listed pursuant to the Endangered Species Act, 16 U.S.C. Section 1531 et seq.

The applicant identifies the following endangered or threatened species that may possibly inhabit or obtain nutrients from the waters affected by the proposed discharge:

Shortnose sturgeon	Acipenser brevirostrum
Blue whale	Balaenoptera musculus
Bowhead whale	Balaena mysticetus
Finback whale	Balaenoptera physalus
Gray whale	Eschrichtius robustus
Humpback whale	Megaptera novaengliae
Right whale	Eubalaena spp. (all species)
Sei whale	Balaenoptera borealis
Sperm whale	Physeter catodon

In a letter of February 15, 1980, the Acting Regional Director for the United States Fish and Wildlife Service (USFWS) concludes that species under USFWS jurisdiction are present only on a transient basis and further consideration is not required.

In a memorandum of May 14, 1980, D. Beach of the Environmental and Technical Services Division of the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration, indicated that none of the species listed in the application could be considered permanent inhabitants of the inshore environment off New Bedford and no further consultation would be required for those species. However, the memorandum indicates that three species not listed by the applicant, the threatened loggerhead sea turtle (Caretta caretta) and the endangered Atlantic Ridley sea turtle (Lepidorhelys kempii) and the leatherback sea turtle (Dermochelys coriacea), are summer inhabitants of southern New England waters, and an assessment should be made of their abundance in the vicinity of the proposed discharge.

Resolution of the potential effects of the proposed discharge on these species would be necessary before an effective 301(h) modified NPDES permit could be issued.

STATE CONCURRENCE IN VARIANCE [40 CFR 125.59(d)(2)]

Section 301(h) and 40 CFR 125.59(d)(2) require State concurrence in the grant of a variance. The State has not yet given its concurrence. Such concurrence would be necessary before an effective 301(h) modified permit could be issued.

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