17.7.38

SDMS DocID 269695

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J. F KENNEDY FEDERAL BUILDING, BOSTON MASSACHUSETTS 02203

JUL 9 1986

Honorable John K. Bullard
Mayor of the City of
New Bedford
Executive Department
P.O. Box A-2089
New Bedford, MA 01740

Dear Mayor Bullard:

After complete and thorough review, I have decided to tentatively deny the 301(h) variance request for the New Bedford wastewater treatment plant submitted by the City of New Bedford. The enclosed tentative decision document carefully considers the information presented in your December 2, 1983, application. In addition, our national 301(h) contractor, Tetra Tech, Inc., has prepared a draft Technical Review Report (TRR) which addresses the technical and scientific aspects of the information presented in the application. A copy of the TRR also is enclosed for your review.

Under the applicable EPA regulations (40 CFR Parts 122 and 124), we intend to develop a draft NPDES permit incorporating the 301(h) decision. The NPDES permit, therefore, will finalize the 301(h) determination.

If you have any questions regarding these matters, please feel free to contact me or Mr. David Fierra, Director, Water Management Divison at 223-3478.

Sincerely yours,

Michael R. Deland
Regional Administrator

Enclosures

cc: S. Russell Sylva, Commissioner, MA DEQE

17.7.38-A

In Re:	
CITY OF NEW BEDFORD PUBLICLY OWNED TREATMENT WORKS, APPLICATION FOR SECTION 301(h) MODIFICATION OF THE SECONDARY TREATMENT REQUIREMENTS OF THE CLEAN WATER ACT	TENTATIVE DECISION OF THE REGIONAL ADMINISTRATOR ON THE REVISED APPLICATION PURSUANT TO 40 CFR PART 125, SUBPART G

I have reviewed the attached evaluation analyzing the merits of the revised application of the City of New Bedford, Massachusetts, for the New Bedford publicly owned treatment works requesting a modification of the secondary treatment requirements of the Clean Water Act pursuant to section 301(h). Under the authority delegated to me by the Administrator, it is my tentative decision that the revised application for a modification of the secondary treatment requirements for the New Bedford treatment works be denied. Region I is hereby authorized to prepare a notice of intent to deny a section 301(h) modified National Pollutant Discharge Elimination System (NPDES) permit and to prepare a draft NPDES permit with effluent limitations based upon secondary treatment and water quality requirements in accordance with this decision.

Dated: July 5, 1984

Regional Administrator

17,7,38.A

ANALYSIS OF THE REVISED SECTION 301(h) APPLICATION OF THE CITY OF NEW BEDFORD, MASSACHUSETTS

PREPARED BY:

ENVIRONMENTAL PROTECTION AGENCY
REGION I

TABLE OF CONTENTS

PAGE

PAGE

INTRODUCTION

The City of New Bedford, Massachusetts (the "applicant") has requested a modification under section 301(h) of the Clean Water Act (the "Act"), 33 U.S.C. section 1311(h), of 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. 53666, Nov. 26, 1982).

The 301(h) Task Force is comprised of scientists and engineers from Region I and consults with experts from EPA's Office of Water and EPA's Office of Research and Development. Tetra Tech, Inc., an outside contractor, was retained by EPA to prepare a Technical Review Report (TRR) (Tetra Tech Inc. 1984a), which analyzes the data submitted by the applicant. The TRR was prepared subject to the guidance of and review by the 301(h) Task Force in accordance with EPA Contract No. 68-01-5906. The Task Force reviewed the revised application, the TRR, and other references and applied the statutory and regulatory criteria to determine if the applicant's proposed discharge qualifies for a modification of the secondary treatment requirements of the Act.

The applicant is seeking a modification to discharge less-than-secondary treated sewage to Buzzards Bay, a saline estuary. The applicant commenced the discharge to marine waters in January 1974. The applicant submitted the first application for a section 301(h) modification in September 1979. The original application was denied by the Administrator of EPA in October 1982. The applicant submitted a revised application in December 1983. The revised application is based on an improved discharge resulting from an outfall extension with the addition of a diffuser and from modifications of the existing primary treatment facility. The applicant is requesting a modification for biochemical oxygen demand (BOD) and suspended solids (SS). The applicant's present and proposed treatment levels are as shown in the table below:

Effluent Characteristics
Annual Average

	1982 Actual	Applicant's Proposed for 1989
BOD mg/l (lbs/day)	102 (19,416)	81 (18,251)
SS mg/l (lbs/day)	108 (20,558)	50 (11,266)
pH	6-9	6-9
Flow mgd	23	27

1. Decision Criteria

Under section 301(b)(1)(B) of the Act, 33 U.S.C. section 1311 (b)(1)(B), publicly owned treatment works (POTW) 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 National Pollutant Discharge Elimination System (NPDES) permits issued to POTWs 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 NPDES 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 non-point 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 non-industrial 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 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.

2. Summary of Findings

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

- The proposed discharge is not expected to violate the Commonwealth of Massachusetts' water quality standard for dissolved oxygen and is not expected to violate the Commonwealth's standard for suspended solids. To assure compliance with the Commonwealth's pH water quality standard, pH control measures would have to be implemented before a modified permit could be issued. [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 may not allow for recreational activities. The discharge will not meet the additional biological requirements for saline estuarine dischargers. [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 would have to be revised pursuant to 40 CFR 125.62(a)(2) before a modified permit could be issued.

- The proposed discharge will not result in any additional requirements on any other point or non-point sources although it may impact the recovery of the presently polluted ecosystem. [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 125.64]. This program would have to be revised pursuant to 40 CFR 125.64(c)(3) before a modified permit could be issued.

- The applicant has proposed a schedule of activities intended to limit the entrance of toxic pollutants[1] from non-industrial sources into the treatment works. [Section 301(h)(6), 40 CFR 125.64]. This program would have to be revised pursuant to 40 CFR 125.64(d)(4) before a modified permit could be issued.

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

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[1] "Toxics" or "toxic pollutants" as used throughout this document refers to both toxic pollutants as defined in 40 CFR 125.58(u) and pesticides as defined in 40 CFR 125.58(m).

3. Conclusion

It is the conclusion of the 301(h) Task Force that the applicant's proposed discharge will adversely impact both 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.

4. Recommendation

It is the recommendation of the 301(h) Task Force that the applicant's revised application be denied in accordance with the above conclusion and that a notice of intent to deny a section 301(h) modified permit and a draft permit with effluent limitations based upon secondary treatment and water quality requirements be prepared in accordance with the provisions of 40 CFR Parts 122-125.

5. Description of the Treatment Facility: Existing and Proposed

The application submitted by the City of New Bedford for the New Bedford treatment plant is based upon an improved discharge into a saline estuary within Buzzards Bay, Massachusetts (Figure 1). The proposed improvements consist of the extension of the outfall, the addition of a diffuser, and modification of the treatment plant to provide proper and efficient primary treatment.

The existing New Bedford primary wastewater treatment plant began discharging to marine waters in January 1974. The plant serves a population of approximately 101,000 people from New Bedford, Acushnet, and Dartmouth. The 1982 annual average flow rate of 1.00 m^3/sec (22.8 mgd) is projected by the applicant to be the same in 1984. The applicant's projected 1989 annual average flow is specified at 1.19 m^3/sec (27.0 mgd). The existing and proposed plant design capacity is reported to be 1.31 m^3/sec (30 mgd).

Presently, the wastewater influent receives primary treatment which consists of screening, primary settling, and chlorination and is discharged through a dry weather outfall. Sludge treatment consists of degritting, thickening, dewatering by centrifuge, and sludge incineration. Flows in excess of 1.31 m^3/sec (30 mgd) bypass treatment and are chlorinated and discharged through a separate, wet weather outfall. The average wet weather flow for 1982 was reported by the applicant to be 1.48 m^3/sec (33.7 mgd). This flow is confirmed by the 1984 discharge monitoring reports (DMRs) which show the average flows for the months of February, March and April to be at 30.9 mgd, 34.8 mgd and 34.0 mgd, respectively. The applicant reported a 1982 maximum flow of 1.76 m^3/sec (40 mgd) and projected a 1989 maximum flow of 2.09 m^3/sec (47.7 mgd). The POTW's DMRs show that maximum daily flows were as high as 76 mgd and 70 mgd in March of 1984 and April of 1985, respectively. Flows in excess of 50 mgd back up in the influent sewer lines and are discharged untreated through the combined sewer overflows (CSOs).

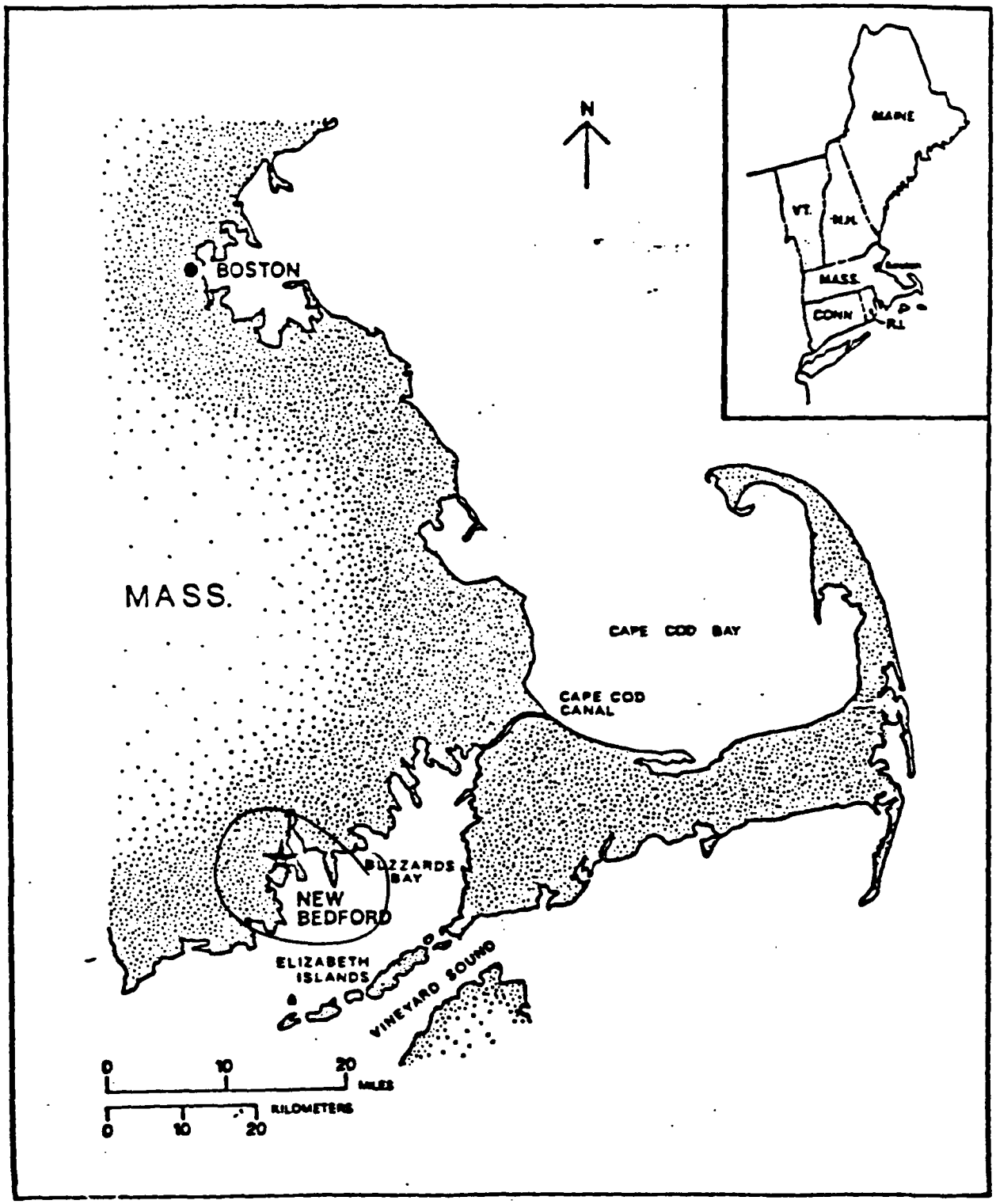

Figure 1. General location of the New Bedford, MA, treatment plant.

The wastewater collection system includes both combined sewers (60 percent) and separate sanitary sewers (40 percent) and receives domestic and industrial sewage. Approximately 47 percent of the New Bedford land area tributary to the wastewater treatment plant is served by combined sewers. This results in combined sewer overflows (CSOs) to Clark's Cove and the inner and the outer New Bedford Harbor. The CSO annual flow is 1,730 million gallons which represents a daily equivalent flow of approximately 0.21 m^3/sec (4.7 mgd). The present industrial flow is estimated to be 0.16 m^3/sec (3.6 mgd) or approximately 16 percent of the total average annual flow.

The EPA inspection reports indicate that the existing plant suffers from operational problems. The plant also has a record of NPDES permit non-compliance for BOD and SS removal as documented by its DMRs. It is presently under an EPA Administrative Order issued August 31, 1984, for construction of treatment plant modifications to meet present permit limitations. The proposed treatment plant improvements, addressed in the 301(h) application, include: upgrading of sludge and grit handling, scum removal, and chlorination. A polymer addition system has also been proposed in the 301(h) application. The information pertaining to the polymer addition system is limited to laboratory scale data. None of the proposed improvements will increase the design capacity of the facility.

Presently, the dry weather outfall discharges in 9 m (29.5 ft) of water, approximately 910 m (2,986 ft) from shore. The wet weather outfall discharges in 7.3 m (24 ft) of water, approximately 305 m (1,000 ft) from shore. The proposed outfall modifications consist of abandoning the present dry weather outfall and extending the wet weather outfall to a length of 7,000 m (22,966 ft). The discharge would occur at a depth of 13.7 m (45 ft) through 20 ports on a diffuser 600 m (1,969 ft) in length. The multiport diffuser would be located within Buzzards Bay at 41° 31' 58" N latitude and 70° 52' 36" W longitude (Figure 2).

6. Description of Receiving Water: Existing and Proposed Discharge Sites

The site of the existing discharge is outside the New Bedford Harbor within Buzzards Bay in southeastern Massachusetts (Figure 2). The inflow from the Acushnet River is only one cubic meter per second or 44,640 cubic meters per 12.4 hour tidal cycle, which represents less than one percent of the 5 x 10^6 cubic meter tidal

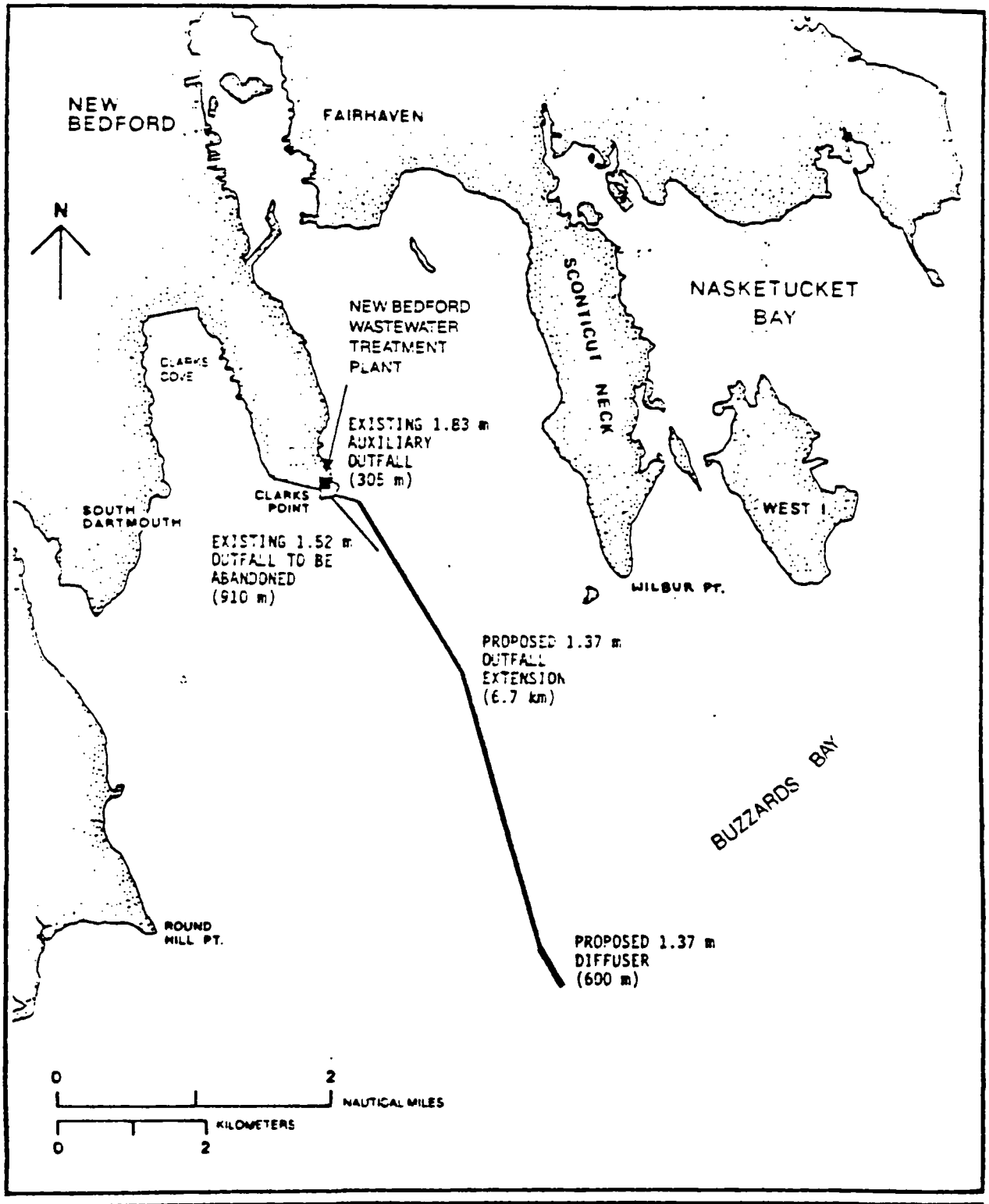

Figure 2. Location of existing and proposed outfalls for the New Bedford Wastewater Treatment Plant.

prism upstream of the New Bedford Harbor hurricane barrier. The mean tidal range in the vicinity of New Bedford is 1.13 m (3.7 ft) and the currents are largely tidal driven.

The proposed discharge location is within an embayment within Buzzards Bay, approximately 21 km (13 mi) from open ocean. Current meter data obtained near the proposed discharge indicate lowest ten percentile currents at 4 cm/sec (0.13 ft/sec). Mean current speeds near the proposed discharge range from 7.3 cm/sec (0.24 ft/sec) at 135° southeast to 15.3 cm/sec (0.50 ft/sec) at 45° northeast. The tidal excursion is approximately 2 km (1.2 miles). The progressive vector plots derived from the applicant's current meter records show semidiurnal oscillations in approximately northeast and south directions. These plots as well as the drogue studies indicate that the net current movement in the area may be a drift to the north, northwest, and west. In this geographic location this drift is towards land. The circulation patterns within the Bay are a subject of further investigation presently being conducted under the Superfund remedial investigation.

The available data indicate that flushing from Buzzards Bay is slow due to the absence of significant freshwater flows. The initial net landward drift indicates that pollutants entering the embayment will remain there for long periods of time.

Estuaries such as Buzzards Bay are extremely productive ecosystems. They provide feeding and nursery grounds, as well as protection for many species of fish and shellfish. For example, maturing fish, lobster, clams, and mussels 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 in saline estuaries. Also, recycling activities of organisms within the sediment and the recovery of nutrients from sediments make estuaries fertile ecosystems. Due to their uniqueness, estuaries are a resource of special biological and economic significance.

The physical and biological characteristics that make the estuaries valuable also make them ecologically vulnerable. Excessive nutrients and microbial contaminants may be retained because of high rates of solids sedimentation and limited flushing with oceanic waters. Estuaries are susceptible to pollution effects because toxic contaminants may accumulate and be retained there for extended periods of time. Certain toxic organic compounds such as polychlorinated biphenyls (PCBs) are resistant to chemical and biological degradation and may remain unchanged for years, acutely and chronically impacting an entire ecosystem. In addition to upsetting the ecological balance, the bioaccumulation of toxic pollutants may threaten the well-being of many important estuarine commercial and sport fisheries. Furthermore, changes in a portion of the biological ecosystem can affect other components of the ecosystem. Alterations in the benthic population, such as dominance by pollution-tolerant species, may in turn modify the food supply of fish, resulting in a decrease in fish variety and abundance (Roesch 1982).

Pollution has caused severe adverse impacts on the fishery resources of New Bedford Harbor and Buzzards Bay (TRR, Part II, Section C). The Massachusetts Department of Public Health (MDPH) issued a closure order in 1979 restricting the taking of lobster, fish, and shellfish for commercial and recreational purposes from various portions of the harbor and Buzzards Bay due to PCB contamination (Figure 3). Because of the severe problem of PCB pollution, New Bedford Harbor was added to the list of Additional Superfund Priority Sites on July 23, 1982, for remedial action in addressing hazards related to toxic waste disposal. In addition, the area near the existing discharge has been closed to harvest of shellfish since 1971 due to contamination by coliform bacteria. These closure boundaries were expanded in 1981 and again in 1983 (Figure 4). The applicant states that mass mortalities of menhaden have occurred inside the hurricane barrier (inner harbor) in 1976, 1977, and 1978.

A high prevalence of non-neoplastic liver lesions has been observed in winter flounder in Clark's Cove, in the vicinity of the existing discharge (Massachusetts Division of Marine Fisheries 1986). Evidence suggests that various fish pathologies may be related to sediment contamination (Sherwood 1982, Malins 1984, Black 1984). Several classes of chemical compounds are thought to have potential for contributing to fish neoplasms and other diseases: polychlorinated biphenyls (PCBs), polycyclic or polynuclear aromatic hydrocarbons (PAHs), and metals (Committee on Merchant Marine and Fisheries 1983).

New Bedford Harbor supports a commercial fishing fleet of over 150 vessels, which landed over 76 million pounds 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.

Quahogs are the dominant commercial bivalve species in the area, followed by the false quahog, oysters, and bay scallops. Crab species 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.

Before the imposition of closure areas, lobster fishing was a commercial as well as a recreational activity. Existing evidence presently supports the conclusion that Buzzards Bay serves as a major source of the lobster stocks found in the Cape Cod Bay and possibly areas to the south of Buzzards Bay. This evidence is presented by Estrella and O'Gorman (1983) and Collings et al.

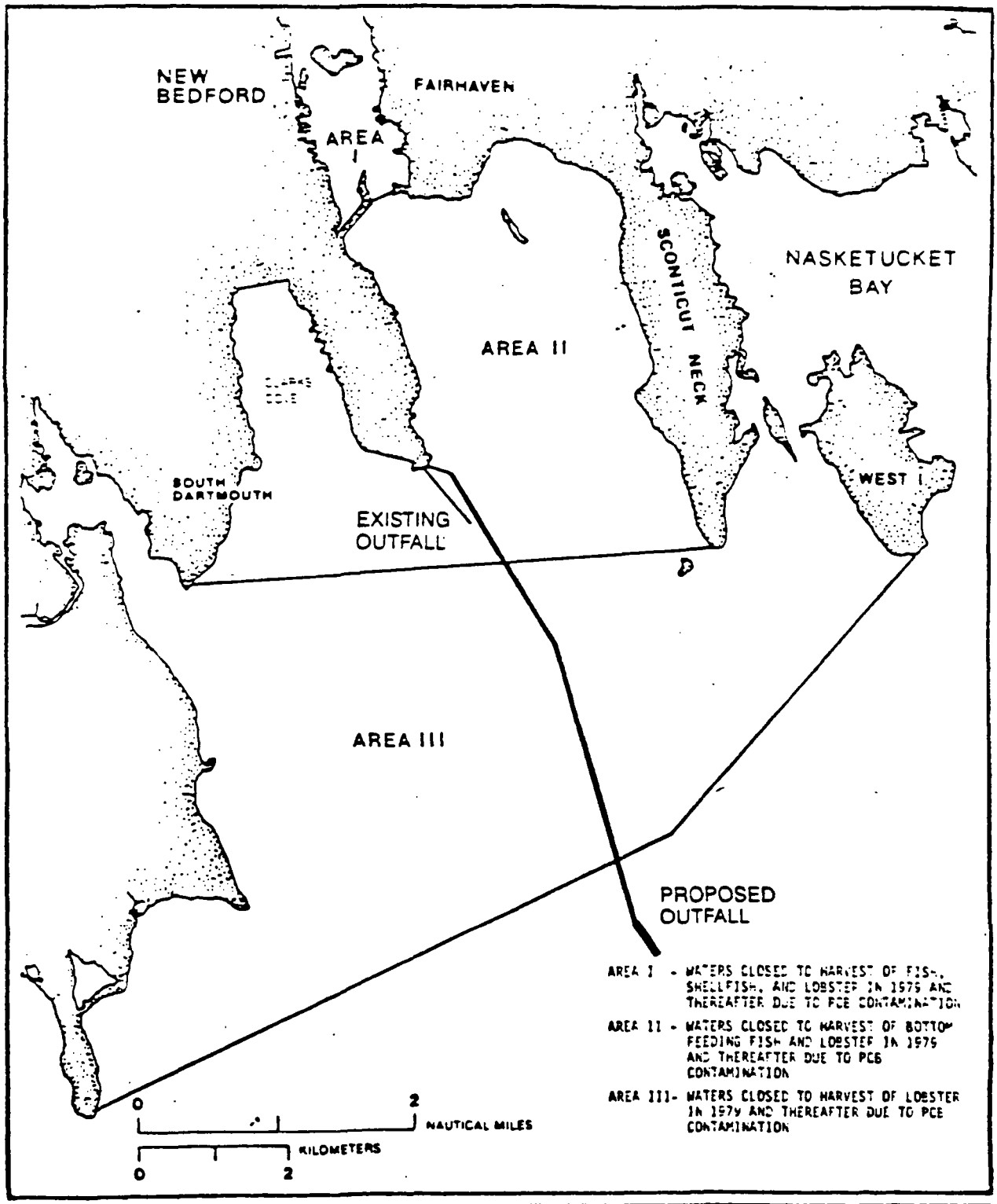

Figure 3. Location of areas closed to commercial and recreational fisheries due to PCB contamination.

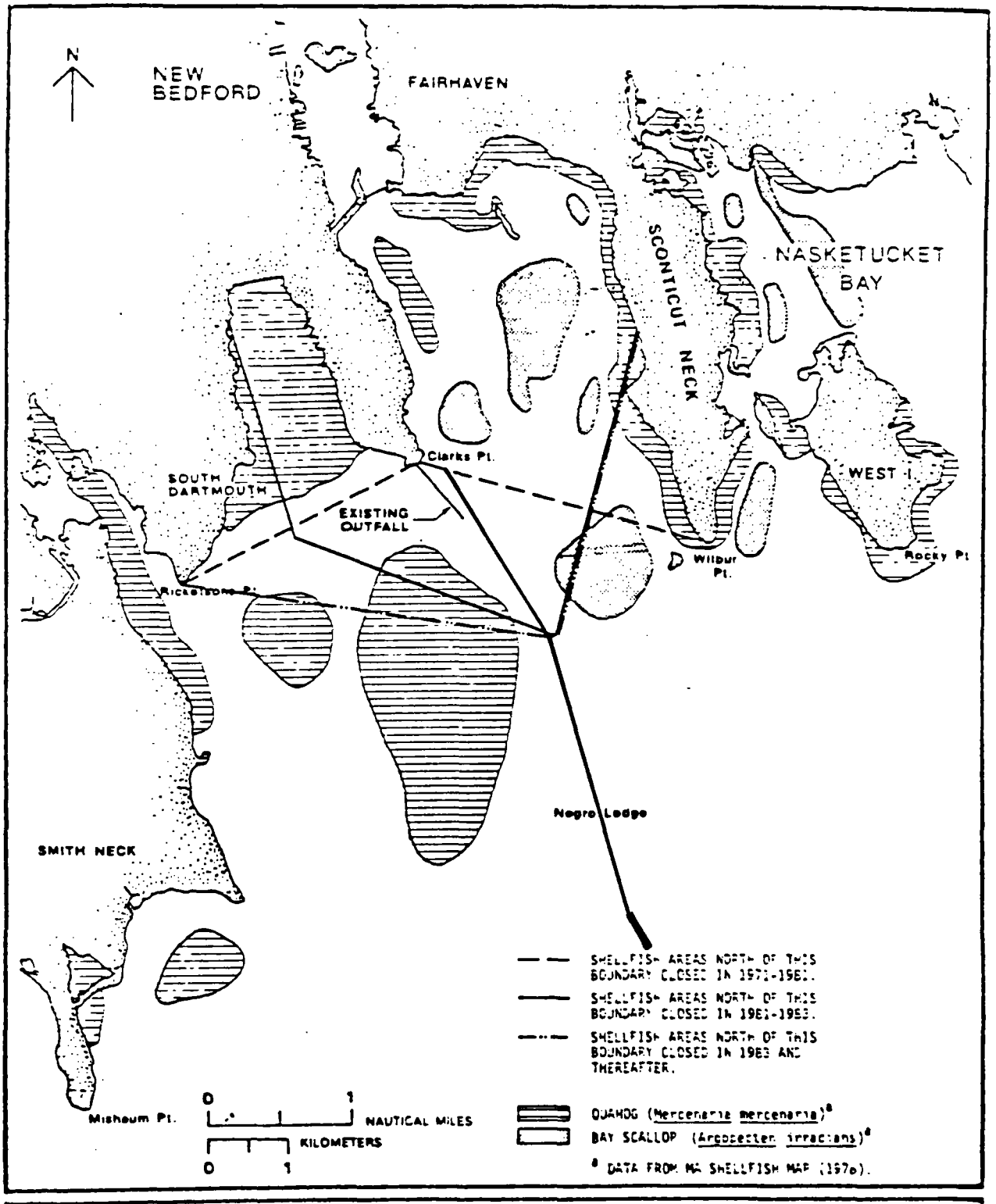

Figure 4. Location of shellfish beds and areas closed due to coliform bacteria contamination in New Bedford Harbor.

(1981) from the Massachusetts Division of Marine Fisheries (MDMF). The survey observations show that Buzzards Bay exhibits the greatest percentage of sublegal berried females (59.1%) as compared to the Cape Cod Bay, Beverly-Salem, Cape Ann, and outer Cape Cod areas as well as the greatest larval densities as compared to other east coast estuaries. The protection of this area from environmental damage is, therefore, of great importance. The MDMF also examined 272 lobsters in 1983 from Massachusetts and Buzzards Bays. Black gill and shell disease trends were similar, with the highest mean incidence observed in Buzzards Bay. The heavy loads of municipal and industrial waste received by these regions, as well as turbidity and bacterial growth are implicated causes (Estrella 1984).

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

In summary, the condition of the receiving waters of Buzzards Bay is currently one of degradation in terms of restrictions on fishery resources, due to high pollutant contamination and benthic alteration. The bay is a very important habitat for commercial and recreational fishery resources, such as lobster and migratory and indigenous fishes. The effects of degradation of the bay on these and other organisms is a matter of serious concern.

APPLICATION OF STATUTORY AND REGULATORY CRITERIA

1. Existence of and Compliance with Applicable 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 discharge will comply with each standard.

The applicant has requested modified requirements for biochemical oxygen demand (BOD), which affects dissolved oxygen (DO), and for 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 (quantitative) and total suspended solids (qualitative).

The waters at the existing and proposed discharge sites have been designated Class SA. The Massachusetts Surface 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 in approved areas" 314 CMR 4.03(3). In addition, the Massachusetts Surface Water Quality Standards state that: "Waters shall be free from pollutants in concentrations or combinations that... produce adverse physiological or behavioral responses in humans or aquatic life...." 314 CMR 4.03(4)(A)(7).

40 CFR 125.60(b)(2) requires the Commonwealth to provide a determination that the proposed modified discharge will comply with applicable provisions of state law including applicable water quality standards. In a letter of September 6, 1984, Thomas McMahon, Director of the Massachusetts Division of Water Pollution Control (MDWPC) states that "there is reasonable assurance that the proposed discharge will not violate applicable water quality standards..." The letter, however, further specifies that the MDWPC's water quality determination is subject to five conditions; 1) implementation of a satisfactory pretreatment program, 2) removal of PCBs from the sewer lines and the treatment plant, 3) monitoring the treatment plant influent and effluent for PCBs, 4) reduction of PCBs in the treatment plant effluent, and 5) compliance by the POTW with its NPDES permit.

1.A. Dissolved Oxygen (DO)

The water quality criterion for Class SA waters requires that the dissolved oxygen (DO) "shall be a minimum of 6.0 mg/l" 314 CMR 4.03(4). In a letter to EPA dated December 15, 1983, Thomas McMahon, Director of the Massachusetts Division of Water Pollution Control, interprets the criterion of 6.0 mg/l as a depth integrated (depth averaged) dissolved oxygen concentration. The letter also states that, "at some point in the water column (usually near the bottom), the DO could be less than the 6.0 mg/l value. So long as this, in the judgement of the Division, does not interfere with the maintenance of a balanced, indigenous population, the standard is considered to be met".

The Task Force, in assessing the applicant's compliance with the dissolved oxygen standard, considered the effects of various oxygen demands on the depth averaged concentration as well as the impact on the balanced, indigenous population of fish and benthic organisms. The assessment of dissolved oxygen demands consists of four separate analyses: (1) the dissolved oxygen concentration after initial dilution; (2) the far-field water column oxygen demand; (3) the steady-state benthic oxygen demand; and (4) the sediment oxygen demand due to abrupt resuspension of solids. The dissolved oxygen demands, as assessed by the above analyses, would be exerted by the effluent BOD in the proximity of the proposed discharge site.

1.A.i. Immediate Oxygen Demand

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 vertically averaged over the plume height of rise in the ambient water; 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 ratio.

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

DO_a =	6.6 mg/l	Station E, August 5, 1980 (City of New Bedford 1983) average over the plume height of rise
Sa =	21:1	See "Outfall/Diffuser and Critical Dilution" section herein.
IDOD =	4.0 mg/l	TSD (Tetra Tech, Inc. 1982a)
DOe =	0.0 mg/l	

The effluent dissolved oxygen concentration (DOe) for the purposes of this review was assumed to be 0.0 mg/l. This conservative estimate was used since the NPDES monitoring report data spanning the years of 1978 through 1980 indicate that the average monthly effluent DO concentrations are often close to the 0.0 mg/l level. More recent plant inspections indicate that septic conditions often develop in the clarifiers affecting the quality of the effluent (EPA memo, from C. Conway and D. Lim to A. DePalma and L. Brill, January 10, 1983). Without a design feature specifically operated to ensure aeration of the effluent, the DO concentrations may frequently approach the 0.0 mg/l value at the New Bedford facility.

Using the above values and formula, the final DO for the proposed discharge after initial dilution is calculated to be 6.1 mg/l. The Commonwealth's dissolved oxygen criterion of 6.0 mg/l would, therefore, be met at the boundry of the zone of initial dilution.

1.A.ii. Far-field Water Column Oxygen Demand

In calculation of far-field dissolved oxygen concentrations, the effects of dilution predominate and the BOD exertion never depresses the dissolved oxygen below the concentration occurring immediately after initial dilution. Thus, far-field BOD exertion is expected to have a negligible effect on far-field dissolved oxygen concentrations.

At the projected 1989 maximum flow of 2.09 m^3/sec (47.7 mgd), as well as at 1984 maximum flow of 3.33 m^3/sec (76 mgd), flows in excess of the plant design capacity of 1.31 m^3/sec (30 mgd) would be discharged through the same outfall and diffuser as the 30 mgd of treated primary effluent. Under these conditions, a portion of the BOD would be receiving no treatment. The applicant does not provide information on the frequency or duration of such events and does not discuss the impact of the untreated discharge, which potentially could be adverse, on the far-field oxygen levels.

1.A.iii. Steady-state Benthic Oxygen Demand

The sediment oxygen demand measured by the applicant and corrected by Tetra Tech (1984) at the proposed site is 0.75 g/m^2/day. As an alternative to the method of determining sediment oxygen demand

from the predicted organic sedimentation rate (Tetra Tech, Inc. 1982a), sediment oxygen demand may be predicted directly from the existing demand by comparing the ambient organic sedimentation rates with the proposed effluent organic sedimentation rates (Tetra Tech, Inc. 1984b). For the 106.6 $g/m^2/yr$ total sedimentation rate an organic sedimentation rate of 85.4 $g/m^2/yr$ was calculated as discussed in the "Transport and Dispersion of Diluted Wastewater and Particulates" section herein. Since the ambient organic sedimentation rate is estimated to range from 70 to 220 $g/m^2/yr$ (Tetra Tech, Inc. 1984b), the proposed discharge would impose an increase of 38.8 to 122 percent over the ambient organic sedimentation rate. Using the measured ambient sediment oxygen demand of 0.75 $g/m^2/day$, an x_m of 6,610 m (21,686 ft), an H of 3.3 m (10.8 ft), a current speed of 4.0 cm/sec (0.131 ft/sec), a conservative subsequent dilution of 1, and Equation VI-24 of the Technical Support Document (Tetra Tech Inc. 1982a), the steady-state sediment oxygen demand was calculated to be 0.435 mg/l (Tetra Tech, Inc. 1984b). Applying the increases of 38.8 to 122 percent to this demand, sediment oxygen demands are predicted to be 0.17 to 0.53 mg/l in the vicinity of the proposed discharge. The larger sediment oxygen demand (0.53 mg/l) would depress the ambient dissolved oxygen concentration from 6.4 to 5.9 mg/l in the bottom 3.3 m (10.8 ft) of the water column. However, when dissolved oxygen concentrations are averaged over the water column, the Massachusetts dissolved oxygen criterion of 6.0 mg/l would be met.

1.A.iv. Sediment Oxygen Demand Due to Abrupt Resuspension of Solids

The estimated oxygen depletion due to the abrupt resuspension of sediments in the bottom 10 m would be 0.1 mg/l. Because the vertically averaged ambient dissolved oxygen concentration is 6.6 mg/l, the vertically averaged 6.0 mg/l criterion would, therefore, be met during resuspension events at the proposed discharge location.

1.A.v. Dissolved Oxygen Impact on the Balanced Indigenous Population

In order to assess the likelihood of adverse impact on the fish and the benthos due to low oxygen concentrations, EPA water quality guidelines as well as other pertinent literature were reviewed.

The most recent EPA water quality guidelines (U.S.EPA 1972) which address dissolved oxygen concentrations in estuaries and coastal waters state that: "The limited laboratory data and field observations of marine organisms suggest that easily observed effects, which are in many cases deleterious, occur with dissolved oxygen concentrations of 4 to 5 mg/l as daily minimum values for periods of several days. As a guideline, therefore, reduction of the dissolved oxygen concentration to values below 4 mg/l can be expected to change the kinds and abundances of the aquatic organisms in the affected volume of water and area of bottom." The most recent guidelines for the protection of fresh water fish, fish embryos and larvae set the minimum dissolved oxygen concentration at 5.0 mg/l (U.S.EPA 1976).

Davis (1975), in a review of pertinent studies, summarizes the oxygen requirements of marine fish and aquatic invertebrates, develops oxygen criteria for fish, and suggests low oxygen tolerance guidelines for invertebrates. Davis concludes that 51% DO saturation at 10°C (4.85 mg/l at 28 ppt salinity) for marine non-anadromous fish and 57% DO saturation at 10°C (5.42 mg/l at 28 ppt salinity) for anadromous fish are levels which may cause deleterious effects in a large portion of a given fish population or fish community, especially if the low oxygen levels are prolonged beyond a very few hours. He further notes that these levels should be applied only if fish populations in the area under consideration are judged hardy or of marginal significance. Owing to the considerable lack of knowledge of the effects of low oxygen on the physiology of marine invertebrates, Davis proposes that the criteria developed for the fish be applied for protection of most aquatic invertebrates.

Of particular concern to the Task Force was the assessment of low DO tolerance by the benthic community since these organisms represent many species incapable of significant locomotion. Recent studies indicate that relatively high levels of dissolved oxygen need to be maintained in order to avoid mortalities in certain marine crustaceans. Shrimp, Crangon sp., mortalities were observed in ecosystem tanks after several days at DO concentrations of 3.0 mg/l (Oviatt 1985). A decrease in benthic community respiration was observed at DO levels of 4.0 mg/l (Oviatt et al. 1980). Blue crab, Callinectes sapidus, 7-day LC_{50} were observed at 3.6 mg/l (20°C and 30 ppt salinities) by Stickle (1985).

Species mortality represents an extreme, adverse impact on a benthic community. Although survival of an organism may not be in jeopardy, the reproductive potential or the behavior of the species may be modified by oxygen levels higher than those required to cause mortality. For example, Capitella capitata, a pollution tolerant species, cannot withstand DO concentrations less than 2.9 mg/l to feed and 3.5 mg/l to reproduce (TRIGOM-PARC 1974). Similarly, the polychaeta, Neanthes arenaceodentata, has been shown to survive at DO concentrations of 0.5 to 1.0 mg/l (40-60% mortality after 56 days); however, it exhibited a marked decrease in egg production at levels below 3.0 mg/l (up to 96% decrease at 0.5 mg/l) (Davis and Reish 1975).

The response of the benthic community to an extreme stress with respect to dissolved oxygen is elimination of intolerant species with a concomitant increase in tolerant species. The result is that the species balance changes and diversity decreases. The extensive mortality of many benthic species, resulting from the 1976 oxygen depletion phenomenon in the New York Bight, is well documented (Steimle and Radosh 1979). In that case, widespread oxygen levels from 0 to 2 mg/l resulted in the death of numerous taxa of mollusks, polychaetes, crustaceans, and echinoderms. Changes in species abundance, with increases in tolerant species, particularly Polydora socialis and Spiophanes bombyx, also were observed. In other studies, the polychaete, Polydora quadrilobata, as well as other spionids, the amphipod, Corophium volutator, and others such as harpacticoid copepods and nematodes have been docu-

mented to inhabit bottoms of periodic low ambient oxygen (Davis 1975). Upon restoration of higher oxygen levels, these organisms, as well as Yoldia sp. and Nephtys sp., become the pioneering colonizers and thus dominate the community. The long-term effects of low oxygen concentrations are dependent on the frequency, duration, and extent of the periods of low dissolved oxygen.

Upon reviewing the information available on biological effects due to low dissolved oxygen levels, the Task Force concludes that in order to maintain and adequately protect the balanced, indigenous population at the proposed discharge site the DO concentration should not be driven below 5.0 mg/l for sustained periods of time as a result of anthropogenic inputs. Under the proposed discharge conditions, the lowest predicted oxygen level anywhere in the water column is 5.9 mg/l and above 5.0 mg/l, therefore, the balanced idigenous population will not be exposed to excessive oxygen depletion and the Commonwealth's DO standard will be met.

1.A.vi. Summary of Dissolved Oxygen Demands and Impacts

In summary, upon consideration of the dissolved oxygen concentration following initial dilution, the far-field oxygen demand, the steady-state benthic oxygen demand and the oxygen demand due to abrupt resuspension of the sediments, the Task Force concludes that the dissolved oxygen concentrations would not drop the vertically averaged levels below 6.0 mg/l and that the Commonwealth's vertically averaged dissolved oxygen criterion would be met by the proposed discharge. In addition, the balanced indigenous population would be adequately protected from excessive oxygen depletion under the proposed discharge conditions. The Task Force, therefore, concludes that the Commonwealth's dissolved oxygen standard will not be violated by the proposed discharge.

1.B. Turbidity, Light Attenuation, Suspended Solids

The Commonwealth of Massachusetts Surface Water Quality Standards specify 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" 314 CMR 4.03(4). There are no quantitative limitations on these parameters.

The applicant reports an ambient range of suspended solids concentrations at the proposed discharge site of 15 mg/l to 36 mg/l at the surface and 5.5 mg/l to 42 mg/l near the bottom.

The New Bedford NPDES Discharge Monitoring Reports for 1982 to 1984 show that the average monthly effluent suspended solids concentrations frequently exceed 100 mg/l. After the planned improvements are completed, the annual average suspended solids concentration is expected to be 50 mg/l. Using the effluent suspended solids concentration of 50 mg/l, an ambient concentration range of 5 mg/l to 42 mg/l, and critical initial dilution of 21:1, a suspended solids concentration range of 7.1 to 42.4 mg/l may be expected near the proposed outfall.

At the maximum flow rate of 2.09 m^3/sec (47.7 mgd), as well at 1984 maximum flow of 3.33 m^3/sec (76 mgd), flows in excess of the plant design capacity of 1.31 m^3/sec (30 mgd) would be discharged through the same outfall/diffuser as the primary effluent Under these conditions portions of the suspended solids would be receiving no treatment. The applicant does not provide information on the frequency or duration of such events and does not discuss the impact of the untreated discharge, which potentially could be adverse, on water quality near the proposed outfall.

At the proposed 50 mg/l suspended solids limitation, the maximum increase in ambient suspended solids would be small compared to the natural range of variability. Thus, the proposed discharge is expected to comply with the Commonwealth's qualitative standard for suspended solids.

1.C. pH

The Massachusetts Surface Water Quality Standard for Class SA waters requires that the receiving water pH "shall be in the range of 6.5 to 8.5 standard units and not more than 0.2 units outside of the naturally occurring range" 314 CMR 4.03(4)(C).

The annual range of pH in New Bedford Harbor is reported to be 6.6 to 10.1 units. The maximum change in receiving water pH was calculated as part of this review to be 0.17 pH units, based on an effluent pH of 6.0, a receiving water pH of 6.6, effluent alkalinity of 2.6 meq/l, a receiving water alkalinity of 2.3 meq/l, a receiving water temperature of 22° C, an effluent temperature of 20° C, a receiving water salinity of 31.9 ppt, and an initial dilution of 21:1. The depression is less than the Massachusetts limit of 0.2 units maximum change in pH from the naturally occurring range. However, if the effluent pH falls below 6.0, violations of the Massachusetts standard could occur. With an initial dilution of 21:1, an effluent pH below 6.0 would cause the depression in receiving water pH to be greater than 0.2 pH units.

Discharge monitoring reports for January 1978 through February 1981 show a range of effluent pH from 3.3 to 9.9. If the ambient pH is low at the time of a low pH effluent discharge (for example, a pH of 3.3), there would be a violation of the standard. An effective pretreatment program and/or pH adjustment would be necessary to ensure that the Commonwealth's pH standard would not be violated.

2. Maintenance of that Water Quality which Assures Protection of Public Water Supplies, the Protection and Propagation of a Balanced Indigenous Population (BIP) of Shellfish, Fish, and Wildlife and Allows Recreational Activities in and on the Water [Section 301(h)(2), 40 CFR 125.61]

of 1.00 m^3/sec (22.8 mgd). The applicant reported a critical initial dilution value of 20:1 with a trapping depth of 1.5 m (4.9 ft) at the 1989 maximum projected discharge flow of 2.09 m^3/sec (47.7 mgd). The density gradient used in these determinations represents a composite of profiles occurring at the proposed site as well as sites closer to shore. The initial dilution was not evaluated for the 1984 and 1985 maximum daily flows of 3.33 m^3/sec (76 mgd) and 3.07 m^3/sec (70 mgd), respectively. These flows were measured in March and April, however, a period when ambient water stratification is not well developed and therefore does not limit effluent dilution.

The TRR reports a critical initial dilution of 27:1 for the 1989 maximum projected discharge flow of 2.09 m^3/sec (47.7 mgd). The density profile used in this determination was observed by the Massachusetts Department of Environmental Quality Engineering on July 22, 1980, at the proposed discharge location.

According to the evaluation performed by the Task Force the initial dilutions reported by the applicant and the TRR do not take into account the blocking effect of the wastefield. When the plume surfaces, the thickness of the wastefield is estimated to be about 30% of the discharge depth. Thus, the available depth over which the rising plume mixes with the dilution water is reduced (Koh 1983). The initial dilution values for which the trapping depth is the surface would be reduced by about 40%. For lower trapping depths, the dilution would be reduced by a lesser amount. The actual oceanographic conditions do not conform to the assumptions made by Koh (1983), however, since completely stagnant conditions occur rarely and persist for only short periods of time in the vicinity of the discharge, and the wastefield configuration is almost always affected by the instantaneous currents. Tetra Tech (1984b) recalculated the initial dilution by taking into account both the blocking effect as well as local currents. This dilution analysis results in a critical initial dilution of 21:1, which is the value used by the Task Force in the evaluation of the revised 301(h) application.

In conclusion, the proposed diffuser design does not provide sufficient initial dilution for protection of receiving waters and may result in sedimentation within the pipe. As a result of the low critical initial dilution, EPA's water quality criteria for toxic pollutants will be exceeded, see "Toxic Pollutants and Biological Impacts" section herein.

The zone of initial dilution (ZID) according to the Task Force calculations would be 29 m (95 ft) wide and 628 m (2059 ft) long, with an area of 0.018 km^2 (0.007 mi^2).

2.A.ii. Transport and Dispersion of Diluted Wastewater and Particulates [40 CFR 125.61(a)(2)]

Accumulation of settleable solids in and beyond the vicinity of the discharge can have adverse effects on water usage and biological communities. Forty CFR 125.61(a)(2) requires that following initial dilution, transport and dispersion of the diluted wastewater

and particles, 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 waters of Buzzards Bay, an elongated body of water approximately 56 km (34.8 mi) in length and of 19.5 km (12.1 mi) maximum width. It opens to the sea at its south end. The mean tidal speed near the proposed outfall is about 13 cm/s (0.43 ft/s). The available data on the estuarine circulation suggest that net drift may be more northerly near the bottom and more westerly near the surface. The low freshwater inflow to the estuary results in a long residence time and containment of wastewater particles in the bay. Further research to fully determine the circulation patterns in the estuary has been undertaken by the Superfund remedial investigation.

In the revised application, using a particle settling simulation model, the maximum total deposition rate for the proposed discharge was calculated to be 106.6 $g/m^2/yr$ over an area of 1 km^2 (0.4 mi^2). A corresponding organic deposition rate of 85.4 $g/m^2/yr$ over the same area yields a steady-state accumulation of 23 g/m^2. The area of 1 km^2 is approximately 56 times the area of the zone of initial dilution (ZID).

Tetra Tech calculated maximum deposition rates in the TRR (Tetra Tech Inc. 1984a) using a modified version of the model described in the technical support document (Tetra Tech Inc. 1982a). The modified version includes the effects of current duration (tidal oscillation) and, therefore, limits the distance that a particle can travel in one direction before flow reversal occurs. In effect, this procedure results in lower net current speeds distributing suspended solids throughout the depositional area. Using this method, the maximum total deposition rate was calculated to be 52.4 $g/m^2/yr$ over an area of 6.0 km^2 (2.3 mi^2). For the 90-day case, the maximum total deposition rate was calculated to be 92.6 $g/m^2/yr$, over an area of 6.0 km^2 (2.3 mi^2). The 90-day steady-state accumulation was calculated to be 12.1 g/m^2 over the same area.

In summary, estimates of the maximum total deposition rate for the proposed discharge range from 52.4 $g/m^2/yr$ reported in the TRR (Tetra Tech, Inc. 1984a) to a value of 106.6 $g/m^2/yr$ reported by the applicant. These values represent an accumulation range of 11.5 g/m^2 to 23.4 g/m^2 over areas 333 to 56 times the ZID, respectively.

.018 km^2

According to the TRR, ambient organic mass deposition rates may range between 70-220 $g/m^2/yr$ at the Buzzards Bay location in the proximity of the proposed discharge. The organic suspended solids deposition rate of 41.9 $g/m^2/yr$ (80% of 52.4 $g/m^2/yr$) reported in the TRR for the proposed discharge would yield a 19 to 60 percent increase in organic deposition rates over an area of 6 km^2 (2.3 mi^2). Using the applicant's predicted organic deposition rate of 85.4 $g/m^2/yr$ (80% of 106.6 $g/m^2/yr$) over an area of 1 km^2 (0.4 mi^2), the proposed discharge would account for a 39 to 121 percent increase in organic deposition rates.

The organic deposition rate due to the existing discharge was estimated in the TRR to be 762 $g/m^2/yr$ over an area of 0.5 km^2 (0.2 mi^2). The percent silt-clay content in the sediment at the proposed ZID, however, is more than five times higher than at the existing ZID (63.1% vs 11.7%) and the percent total volatile solids of the sediment is about 33 percent greater at the proposed than at the existing site (4.8% vs 3.6%). These sediment characteristics indicate that the proposed site is a depositional area so that sewage particles and associated pollutants would tend to accumulate in the proposed ZID.

The relocation of the proposed outfall to a greater depth, 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 and the absence of significant fresh water inflow to promote flushing, pollutants discharged at the proposed outfall would tend to remain in the system and recirculate in the estuary. The applicant's water current studies and the depiction of the estuarine circulation in the bay which indicate net transport will be landward; the depositional nature of the proposed site sediment; and the up-estuary wind field indicate the potential for poor flushing and dispersion at the proposed discharge site. Thus, the location of the proposed outfall, even though further from shore than the existing site, still does not ensure adequate transport and dispersion of the effluent. A4

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

The applicant's proposed modified discharge must allow the attainment and 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 (TRR, Part III, Section C).

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

2.C.i. BIP Beyond the ZID: Existing Discharge Site [40 CFR 125.61(c)(1) and (2)]

The proposed discharge must allow for the attainment or maintenance of water quality which assures protection and propagation of a balanced indigenous population (BIP) of shellfish, fish, and wildlife. The applicant must demonstrate that a balanced indigenous population 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 in 1979 and 1983. A bioaccumulation study also was conducted by the applicant in 1979 and was supplemented with data from the Massachusetts Division of Marine Fisheries.

2.C.i.a. Plankton

In August 1979, the applicant surveyed phytoplankton at five stations in the vicinity of the existing and proposed discharge locations and at one control station. 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. The common diatom, Skeletonema costatum, was abundant in Naskatucket Bay (control station) inshore of West Island. Species of euglenas and blue-green algae occurred near the existing discharge in small numbers. The presence of euglenas and blue-green algae, even in low density, indicates over-enrichment 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. However, the presence of euglenas and blue-green algae, together with the unusually small sized species of inshore diatoms, cryptophytes, and chrysophytes are indications of the influence of organic enrichment shoreward of the discharge. Although the structure of the phytoplankton population inshore of the discharge has shifted toward smaller cells, some of which are pollution-tolerant, it may be concluded that in spite of enrichment from the existing discharge, the phytoplanktons' function as primary producers remains intact. (B3)

Phytoplankton studies also were conducted by the applicant in 1983. These studies consisted of sampling at a number of the sites used in 1979 as well as new sites, taking whole water samples, sample fixation, and examination under an inverted light microscope. Identified species were analyzed for taxonomically based numerical measures of population abundance, distribution, classification, and ordination. Indications of impact due to the present discharge are apparent in the dominant presence of euglenoids, blue-green algae, and microalgal forms in conjunction with the spatial relation to the discharge. These population shifts support the conclusion based on previous studies; they indicate stress but do not indicate that the phytoplankton populations are incapable of serving their normal function as the base of a food web. The structural alteration of the phytoplankton population, while being an indication of community imbalance, does not indicate an alteration of the population's functional role in the community at the existing New Bedford discharge site. (B3)

The applicant's zooplankton studies in August 1979 paralleled the phytoplankton studies with regard to sampling zones, times, and statistical evaluation of data. The 48 species counted in six samples indicate a diverse population of zooplankton which, unlike the phytoplankton, did not differ significantly from sample to sample. Zooplankton abundance seemed greater in New Bedford Harbor than at the Nasketucket Bay control stations, although this did 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 54 percent. 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. Because adverse impacts on zooplankton resulting from the existing discharge were not found, none are expected in the vicinity of the proposed discharge.

2.C.i.b. Intertidal Assemblages

In 1979, the applicant reported that the rocky, intertidal assemblages directly inshore of the existing discharge and at a reference area on West Island were dominated by New England rockweed, Fucus vesiculosus, and barnacles. Together the two constituted the major cover of the rock substrate, with rockweed making up 20 to 99 percent of the plants and barnacles constituting 98 percent of the animals. Three distinct zones of high, middle, and low intertidal assemblages could be distinguished, but species overlap was considerable. Although species richness was similar between the New Bedford Harbor station and the Nasketucket Bay station, the total density of animals on New Bedford Harbor rocks showed a significant decrease. The density difference was most likely due to the greater density of predatory snails at the New Bedford Harbor site. Thus, although density and species richness of intertidal plant and animal assemblages varied, these indicators appeared to be within the range of natural variation expected for rocky New England shorelines. Relocation of the discharge further from the rocky intertidal habitats would reduce the potential for adverse impacts.

2.C.i.c. Benthos

The applicant submitted data on benthic impact near the existing and the proposed discharge sites. The data consist of two surveys, one performed in August 1979 and the second performed in August 1983.

In the 1979 study the two stations closest to the existing ZID were approximately 67 m (220 ft) and 158 m (518 ft) beyond the boundary of the ZID. The applicant used several adequate control stations in Nasketucket Bay. There was considerable overlap in the values of certain benthic parameters for the stations nearest the ZID and the controls in Nasketucket Bay. However, each of the mean values for the density, the species richness, and the Shannon-Wiener diversity index for the two stations nearest the ZID were lower than the corresponding means at the control stations. In addition, the values for density, species richness, and diversity at the near ZID stations were significantly lower than those for the station group within New Bedford Harbor. Furthermore, the lowest values for species richness, evenness, and diversity also were found at the near ZID stations. When all the samples were analyzed for similarity of the relative abundance of species by cluster analysis, the near ZID stations formed a distinct cluster. This indicates a difference in the community structure between the existing discharge area and parts of New Bedford Harbor and Nasketucket Bay.

Two lines of evidence indicate that the altered benthos near the existing ZID results from the present discharge. First, density, species richness, and diversity were lowest at the station nearest the ZID (67 m from the ZID) and increased progressively to the station furthest from the ZID (582 m from the ZID). Second, the polychaete worm, Nereis succinea, was the dominant species at near-discharge stations. 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 dominant species at the near discharge stations is indicative of moderate to high levels of organic enrichmment.

Judging from the locations of the near ZID and control stations in the 1979 study, the altered benthos extended at least 158 m (518 ft) from the existing ZID but less than 582 m (1910 ft). Assuming a circular shape for the affected area, the altered benthos covered more than 0.08 km^2 (0.03 mi^2) but less than 1.06 km^2 (0.41 mi^2). The benthic population beyond the ZID boundary is, therefore, outside the range of natural variation, as shown by the evaluation of the dominance of pollution tolerant species and other indicators of benthic health.

In August 1983, the applicant sampled the benthos at 12 stations near the existing and the proposed discharges. Several measures of community structure demonstrate that the bethos near the existing discharge has been negatively impacted. Stations within and near the ZID were dominated by pollution tolerant species. The highly pollution tolerant worm, Capitella capitata, was the most abundant species at the stations near the ZID. This indicates a very high degree of pollution within the ZID and at the ZID boundry. Stations up to 1 km away from the ZID also had enhanced abundances of several opportunistic species (e.g., Mediomastus ambiseta, Polydora ligni, and Macoma tenta), probably due to organic enrichment from the existing discharge. as indicated by

The mean number of species per sample and the total benthic density displayed generally similar patterns: values were depressed at the within ZID and ZID boundary stations. Values increased at stations about 0.5 to 1.0 km from the ZID and then declined at stations farther from the discharge. This type of pattern is consistent with the Pearson and Rosenberg (1978) model of organic enrichment. The reduction near the discharge indicates that the benthic community is altered beyond the "peak of opportunists", and thus is a highly altered community. The stations 0.5 to 1.0 km from the discharge appear to correspond to benthic communities at the end of the "transitional zone" of the Pearson and Rosenberg gradient of organic pollution and, as such, lie outside the range of natural variation.

2.C.i.d. Fisheries

The applicant's fish surveys included a one-day August 1979 otter trawl survey at four stations (near existing ZID, beyond existing ZID, and two reference sites) and a discussion of estuarine fishes endemic to the Slocum River estuary south of New Bedford. In addition, fish sampling was conducted with a Marinovich otter trawl on two occasions in 1983 to characterize demersal species at four stations (existing and proposed discharge sites and shallow and deep water reference sites).

In the 1979 sampling, six pelagic fish species were represented. Four of the species collected are considered to be among the ten most abundant species in southeastern coastal Massachusetts waters.

Winter flounder, usually present in July and August although less abundant than at other times of the year, were notably absent from the fish samples collected. According to Black (1985), these flatfishes are ordinarily present in New Bedford Harbor, near the existing discharge and in other areas of Buzzards Bay and should have been present in the applicant's trawls at the proposed discharge location and at the reference sites. Absence of flounder in the applicant's bottom trawl survey indicates that the methods or techniques employed were probably inadequate.

The applicant noted that scup were the dominant finfish species collected in the otter trawls. The largest density occurred at the existing discharge location. The applicant concluded that these fishes may have been attracted to the existing discharge in order 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 the known feeding behavior of scup, it is reasonable to assume that the fish were foraging on these worms.

Sixteen invertebrate species were collected during the applicant's 1979 shellfish survey. The dominant bivalve species was the hard-shelled clam followed by the false quahog and oyster. The fourth most abundant species collected was the spider crab. There was considerable variation in species composition and abundance among sites. The applicant attributed this to natural variation, substrate preferences, and commercial fishing pressure. The data indicate that shellfish species collected by the applicant were typical of those expected in New England coastal waters. However, shellfish closures are now in effect in New Bedford Harbor and Buzzards Bay. The Massachusetts Department of Environmental Quality Engineering expanded the area of shellfish closure in 1983 as a result of high coliform counts (Figure 4). These high coliform counts may be attributed to Acushnet River pollution, discharges from combined sewer overflows in New Bedford and Fairhaven, and the poor reliability of the New Bedford treatment plant.

The 1983 surveys provided a more precise characterization of species composition and of abundance, dominance, and diversity of the local fish community. Four stations were sampled by otter trawl during the two survey periods in August and October 1983. Total numbers of fishes caught were greatest near the existing discharge, intermediate in control areas, and lowest near the proposed discharge site.

The eight 10-minute tows yielded a total of 1,761 fish of 14 species. The average number of fish per trawl was 220 and the median number of fish per trawl was 196. In terms of relative abundance, six species accounted for 99 percent of the fishes collected in both the August and October sampling periods. These were:

- Scup (Stenotomus chrysops) - 81 percent
- Black sea bass (Centropristis striata) - 13 percent
- Winter flounder (Pseudopleuronectes americanus) - 2 percent
- Bay anchovy (Anchoa mitchilli) - 1 percent
- Northern searobin (Prionotus carolinus) - 1 percent
- Fourbeard rockling (Enchelyopus cimbrius) - 1 percent

Eight additional species accounted for the remainder of fishes collected: butterfish (Peprilus triacanthus), cunner (Tautogolabrus adspersus), summer flounder (Paralichthys dentatus), northern pipefish (Syngnathus fuscus), tautog (Tautoga onitis), pinfish (Lagodon rhomboides), seaboard goby (Gobiosoma ginsburgi), and guaguanche Sphyraena guachancho).

Data pooled for the August and October sampling periods indicate that the number of species was greatest at the existing discharge site (12 species), lowest at the proposed discharge site (4 species), and intermediate for the two reference sites (7 species at each). Diversity was lowest at the existing discharge site (0.64) because of the overwhelming dominance of a single species, scup. Diversity was greatest (1.60) at the proposed discharge site, even though abundance and number of species were lowest at this station. High diversity in this case was presumably the result of diminished dominance of scup, as indicated in the comparatively high evenness index (0.8).

The applicant also summarizes the results of trawl surveys that have been conducted by the Massachusetts Division of Marine Fisheries (MDMF) in the vicinity of the existing and proposed discharge sites. Sampling was conducted semi-annually in May and September 1978-1983. In the MDMF survey, 16 species of fishes were found in the area of the existing discharge and 21 species were found in the area of the proposed discharge. Overall abundance again was dominated by a few species. Scup and striped anchovy (Anchoa hepsetus) accounted for over 95 percent of the fishes caught by whiting trawl in September near the existing discharge. Similarly, scup, butterfish, and silver hake (Merluccius bilinearis) accounted for over 95 percent of the fishes caught in the area of the proposed discharge.

An important taxonomic group that occurred in relatively low densities was the flatfishes. Four species of flounder were present in the surveys: winter flounder, summer flounder, windowpane flounder (Scophthalmus aquosus), and fourspot flounder (Paralichthys oblongus). Winter and summer flounder were the only flounder species collected in the applicant's August-October 1983 survey of the area, whereas all four species were present in the MDMF survey. No flounder were collected at the proposed discharge site in the applicant's August-October 1983 surveys. These results suggest that flounder, like scup, occur in higher densities around the existing discharge than they do elsewhere in the study area. The limited data indicate that the fish fauna in New Bedford Harbor and Buzzards Bay is diverse and similar to other New England estuaries.

Trawl-caught macroinvertebrates also were collected in the MDMF surveys. Relative abundance of longfin squid (Loligo pealei) was 41.0 percent (by number) of the total catch in the area of the existing discharge and 12.6 percent in the area of the proposed discharge. These data suggest that longfin squid are an important constituent of the pelagic community in the vicinity of the existing and proposed discharge sites. Buzzards Bay and adjacent waters of Martha's Vineyard, Vineyard Sound, and Nantucket Sound are a major spawning area for longfin squid. There is no squid fishery in Buzzards Bay because the bay has been closed to trawling since the early 1920s (Amaral 1984). However, remaining open areas around Buzzards Bay support extremely productive squid fisheries.

Existing evidence supports the conclusion that Buzzards Bay serves as a major source of the sublegal size and subsequently legal size lobster stocks found in the Cape Cod Bay and possibly areas to the south of Buzzards Bay. This evidence is presented by Estrella and O'Gorman (1983) and Collings et al. (1981) from the Massachusetts Division of Marine Fisheries. It consists of survey observations which show that Buzzards Bay exhibits the greatest percentage of sublegal berried females (59.1%) as compared to the Cape Cod Bay, Beverly-Salem, Cape Ann, and outer Cape Cod areas as well as the greatest larval densities as compared to other east coast estuaries.

Based on the applicant's 1979 and 1983 surveys as well as other studies presented in the application, the existing discharge does not appear to serve as a disease epicenter for fish. Grossly visible finrot, papillomas, and other external anomalies were not apparent in specimens collected by the applicant. However, the potential for internal lesions in fish due to effects of discharges of metals and other inorganic and organic materials has not been comprehensively studied or assessed. As discussed below, some evidence exists on the impacts of pollution on the fish and shellfish from the area.

In 1985, bottom trawl surveys of demersal fish populations were performed in Massachusetts Bay outside of Boston Harbor, the nearshore area outside of Plymouth Bay, southern Cape Cod Bay, Buzzards Bay, Nantucket Sound and outer Cape Cod (Massachusetts Division of Marine Fisheries 1986). Histopathological examinations for the presence or absence of liver lesions in winter flounder and the distributional trends in the prevalence of these conditions were noted. Massachusetts Bay outside of Boston Harbor, the nearshore area outside of Plymouth Bay, southern Cape Cod Bay and lower Buzzards Bay were four areas with apparently elevated lesion prevalences. Winter flounder from Nantucket Sound and outer Cape Cod stations appeared to be free of liver lesions.

The 36 Buzzards Bay samples from Clark's Cove showed a high prevalence of non-neoplastic lesions (53% of combined samples collected in the spring and fall of 1985). This, according to the Division, suggests that winter flounder health in this location is more seriously affected by pollution than elsewhere along the coast. The Division also reports that winter flounder livers recently collected from Georges Bank, some 150 miles east of Cape Cod, were completely free of the lesions and that the 1985 coastal sampling, excluding the Clark's Cove samples, yielded only a 3% prevalence rate for non-neoplastic liver abnormalities in winter flounder.

In 1983, the Massachusetts Division of Marine Fisheries examined 272 lobsters from Massachusetts and Buzzards Bays. Black gill and shell disease trends were similar, with highest mean incidence observed in Buzzards Bay (54.2% black gill and 50.0% shell disease). The heavy loads of municipal and industrial waste received by these regions, as well as turbidity and bacterial growth, are implicated (Estrella 1984).

Sufficient data are available to assess the serious contamination of New Bedford Harbor and Buzzards Bay by heavy metals, PCBs, and other pollutants. The area of the existing discharge was closed to the taking of bottom feeding fish and lobsters by the Commonwealth of Massachusetts due to PCB contamination. As discussed in the following "Toxic Pollutants and Bioaccumulation" section, the concentrations of PCBs and other toxic pollutants in the effluent and in the sediments around the existing discharge indicate that the discharge has contributed to the severe pollution and to contamination of fish and shellfish in this area.

2.C.i.e. Toxic Pollutants and Bioaccumulation

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 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. The synergistic effects of two or more pollutants also may increase severity of impacts.

Marine organisms bioaccumulate to high levels many toxic pollutants from the water, sediment, and food. This can result in the impacts mentioned above. In addition, certain toxic pollutants are transferred through the food web and bioaccumulate in recreationally and commercially important species. Consumption of these fish and shellfish can lead to the uptake of toxic pollutants by humans.

EPA water quality criteria (WQC) provide a useful guide for evaluating whether toxic priority pollutants are present in seawater water in concentrations that adversely affect biota (45 Fed. Reg. 79318, November 20, 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 generally will ensure water quality adequate to support the pertinent water use. The criteria represent pollutant concentrations that generally will provide adequate protection for the environment. 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 also are used, when available, to make predictions about toxic effects on the environment.

EPA's list of priority pollutants represents only a fraction of harmful substances and, therefore, identifies the potential for toxic impact to a limited degree. Furthermore, water quality criteria are available for only a portion of the priority pollutants. In recognition of the potential for adverse biological impacts due to sediment contamination, EPA's Office of Research and Development is starting to develop criteria for specific pollutant levels in sediments.

The Commonwealth's surface water quality standards provide that waters must be free from pollutants in concentrations or combinations that "exceed the recommended limits on the most sensitive receiving water use" or "injure, are toxic to, or produce adverse physiological or behavioral responses in humans or aquatic life" 314 CMR 4.03(4). According to 314 CMR 4.03(2), EPA water quality criteria are to be used to interpret the narrative standard in 314 CMR 4.03(4) and as guidance in establishing case-by-case discharge limits for pollutants not specifically listed in the Massachusetts surface water quality standards but which are covered by 314 CMR 4.03(4).

Industrial wastes constitute 16 percent of the existing New Bedford discharge flow and are predicted by the applicant to constitute 13 percent of the discharge flow in 1989. The applicant reported a total of 57 organic compounds, 13 metals, and 6 pesticides from the EPA list of 129 priority pollutants as the result of effluent sampling and analysis performed in 1979. The results of more recent 1983 effluent analyses again show the presence of 13 metals, while the number of other priority pollutants was reduced to nine. This reduction is attributed by the applicant to a decrease in industrial flow into the treatment system.

is widespread in the vicinity of the existing discharge. The spatial resolution of the sediment data, however, is not sufficient to define the areal extent or relative contribution of PCB contamination caused specifically by the existing discharge.

The 1979 data indicate that metal concentrations in the sediment were highest near the existing ZID. The ranges of sediment concentrations of chromium, mercury, nickel, zinc, lead, and cadmium from the ZID and near ZID sites exceeded the values from the control areas, the outer New Bedford Harbor sites, and the 1979 proposed outfall site in some cases by two orders of magnitude. Copper concentrations near the outfall exceeded control site values as well. These pollutants have been identified at high concentration in the existing discharge; see "Toxic Pollutants and Biological Impacts" section below. Compounds such as PCBs, mercury, copper, cyanide, silver, lead, nickel, and endosulfan in the effluent exceeded WQC after the critical initial dilution of the proposed discharge. The reported elevated levels of PCBs and metals in the sediments in the vicinity of the existing discharge indicate that the outfall may be a significant source of these pollutants.

It may be concluded from the applicant's bioaccumulation data supplied with the 1979 application that some metals (chromium, copper, nickel, and zinc) present in unspecified shellfish tissue are at higher concentrations in shellfish from near the existing outfall than from the surrounding areas. Endosulfan concentration in the applicant's 1979 wet-weather effluent exceeded EPA Water Quality Criteria by a factor of 5.4 after critical initial dilution of the proposed discharge. However, ambient water or tissue data on endosulfan were not presented in either the original or the revised application. 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 in marine organisms as great as 1000 over ambient water concentrations (U.S.EPA 1980).

The concentration of PCBs in shellfish collected at the existing outfall and reported in 1979 by the applicant was <0.001 mg/kg wet weight (ppm) which is considerably lower than the concentrations reported in other studies of New Bedford Harbor. Kolek and Ceurvels (1981) reported a PCB concentration range of 0.6-1.8 ppm for four quahog samples collected near the existing outfall in 1976 and 1979.

Kolek and Ceurvels also compiled PCB bioaccumulation data for finfish and shellfish in the area of the New Bedford Harbor and Buzzards Bay in 1976, 1977, 1978, 1979, and 1980. The reported body burden in winter flounder, Pseudopleuronectes americanus, near the existing discharge was 3.8 ppm. Near the proposed discharge site the maximum reported concentration was 11.0 ppm. The report also presents extensive data on PCB concentrations in lobster muscle tissue. The levels of PCBs in lobster are available from two stations in the vicinity of the existing discharge site and from five stations in the vicinity of the proposed discharge. PCB concentrations ranged from 1.0 to 68.2 ppm for the existing discharge area. Near the existing discharge, 15 of 23 lobsters (65%) collected exceeded the 2 ppm tolerance level. The Food and Drug Administration's (FDA) tolerance level reflects a balance between adequately protecting the public health and avoiding excessive losses of food to the consumer. The lobster hepatopancreas concentrates PCBs and some pesticides to higher concentrations than muscle. Lake (1981) has noted that the lobster hepatopancreas bioaccumulated PCBs at levels 74 times higher than lobster muscle. Since humans consume both the hepatopancreas and muscle, the FDA tolerance level should be compared to a combined analyses of both tissues. The analyses of only muscle tissue underestimate the extent by which FDA tolerance levels are exceeded for lobster.

The Massachusetts Division of Marine Fisheries and the Massachusetts Food and Drug Administration conducted a seasonal lobster sampling program (Kolek 1986) from 1980 to 1985 in the closure area III (Figure 3). The PCB levels were determined in the edible lobster tissue obtained from eleven stations within the closure area in 15 surveys over this time period. The average edible lobster tissue concentrations of PCBs for each station were computed, and ranged from 2.4 to 7.3 ppm wet weight. All average concentrations were above the FDA tolerance level of 2 ppm.

The Massachusetts Department of Public Health performed a survey of the levels of PCBs in bluefish caught in Massachusetts coastal waters. Average tissue PCB concentrations in fish from Buzzards Bay were 2.3 ppm and from Nantucket and Vineyard Sound were 2.9 ppm. Although the fish are considered migratory and may be exposed to high PCB concentrations in other habitats, the average tissue PCB concentration for Cape Cod Bay was lower at 0.8 ppm (Massachusetts Department of Public Health 1983).

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 discharge is in the vicinity of the boundary of the area closed by the MDPH to lobster harvesting. Relocation of the discharge may result in the extension of the closure boundaries to incorporate the new discharge area, further restricting additional waters to the harvest and consumption of certain marine animals. EPA recognizes that the existing New Bedford POTW discharge is not the only source of pollutants to the Bay. Other point source discharges are subject to the limitations and conditions of NPDES permits. Pollutants being released from the sediments of New Bedford Harbor, and possible remedies for such releases, are the subject of ongoing studies under the Superfund program.

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 the biota in the vicinity of the existing discharge. Pollution from the existing discharge as well as other sources, particularly with respect to PCB contamination, has resulted in severe impacts on fisheries in the area, including closures of fish, shellfish, and lobster harvesting areas.

2.C.i.f. BIP Beyond the ZID Summary: Existing Discharge Site

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. Toxics in the effluent are contributing to bioaccumulation, particularly of PCBs, by organisms in the area. The existing discharge has contributed to contamination of shellfish by coliform bacteria. Adverse impacts on the biota including lobster pathology, winter flounder non-neoplastic liver lesions, as well as fish kills in New Bedford Harbor may be attributed ~~in part~~ partially to the existing discharge.

2.C.ii. BIP Beyond the ZID: Proposed Discharge Site

As set forth at the beginning of section 2.C., on the "Biological Impact of the Discharge", the proposed discharge must allow for the attainment or maintenance of water quality which assures protection and propagation of a balanced indigenous population (BIP) of shellfish, fish, and wildlife. The applicant must demonstrate that a 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's proposed improvements include construction of an extended outfall and diffuser and proposed reduction of present mass emissions of suspended solids and BOD. The critical initial dilution would be increased from 5:1 to 21:1. The depth of the outfall would be increased from 9 m to 13.7 m at the proposed location and more effective dispersion of the effluent will occur.

However, only slight improvement over the existing outfall would be achieved with the proposed discharge. The reason for this is that estuaries, in general, act as traps for particulates whereas open ocean discharges allow for considerable transport and dispersion. The open ocean is outside Buzzards Bay, approximately 21 km (13 mi) from the proposed discharge site. With this application for a discharge to an estuary, the problems are particularly severe since the proposed discharge would affect an area already heavily impacted by pollution. As discussed in the "Transport and Dispersion" section herein, the estuarine circulation and long residence time of particulates within the embayment would not ensure efficient dispersion. Furthermore, evidence suggests that the proposed discharge location is an area of natural solids deposition indicating high potential for adverse environmental impacts.

2.C.ii.a. Plankton

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) nutrient input would decrease due to the reduced mass emission to the estuary; (2) the proposed discharge would be more isolated from other pollution sources with which the existing discharge interacts; and (3) recruitment of a more normal population of phytoplankton into the proposed wastefield would occur.

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 would reduce the potential for adverse impacts on those habitats.

2.C.ii.b. Benthos and Fisheries

The relocation of the discharge would result in a greater dispersion of the effluent solids within Buzzards Bay. However, the poor flushing of the region indicates that most of the sewage solids would continue to remain within the estuary. Increased sewage particle deposition rates can result in adverse impacts on benthic fauna especially if the concentrations of toxic substances in the effluent are high. The proposed discharge would result in a greater area of the benthos being affected, although the organic deposition rate in the immediate vicinity of the proposed discharge would not be as great as near the existing discharge. The predicted deposition rate of approximately 106.6 $g/m^2/yr$ is expected to result in modifications of the benthos. The corresponding accumulation rate of 23 g/m^2 is approximately at the threshold accumulation of 25 g/m^2 at which biological effects may be observed in estuaries

292

$Kd = 0.0127^{34}$??

(Tetra Tech, Inc., 1982a). The steady-state accumulation of 23 g/m^2 is expected over an area of 1 km^2 which is an area approximately 56 times the size of the proposed ZID. The accumulation at the ZID boundary and beyond, therefore, is expected to far exceed the 25 g/m^2 threshold value, and is expected to lead to alterations in the benthic community structure both within and beyond the ZID. The benthic community would lie outside the natural range of variability beyond the ZID of the proposed discharge. Changes in the abundance and type of benthic prey species can affect bottom feeding fishes directly by altering the amount of food or indirectly by increasing the potential for the transfer of contaminants from sediments to fishes. Thus, the expected increase in opportunistic benthos could result in an increased incidence of fish feeding on prey with moderate to high levels of PCBs and other contaminants.

The proposed discharge is also expected to continue contributing to the increased prevalence of non-neoplastic liver lesions in winter flounder. Although no comprehensive studies on the health of the fisheries in the vicinity of the existing discharge were provided by the applicant or are available from other sources, the recent MDMF surveys indicate that the elevated levels of pollutants in the vicinity of the existing discharge may be in part responsible for the prevalence of the non-neoplastic liver lesions in winter flounder caught in the area. EPA recognizes that there is no definitive proof for either attributing or not attributing the observed non-neoplastic liver lesion incidence in winter flounder from Clark's Cove to the existing sewage discharge. However, environmentally conservative inferences are drawn in the absence of comprehensive data or scientific certainty.

The 301(h) Task Force evaluated the material presented by the MDMF (1986) survey, scientific literature and data pertinent to fish disease, and information pertinent to contaminants found in the New Bedford treatment plant effluents. EPA notes that individual, toxic substances, such as PCBs and metals found in the existing discharge, have been shown to be toxic, carcinogenic, mutagenic and/or teratogenic. EPA also notes that numerous field and laboratory studies have shown that fish disease is correlated to sediment contamination. EPA, therefore, concludes that the impact, such as non-neoplastic lesion incidence, to the extent that it is caused by the existing discharge, is likely to be transferred to the proposed discharge vicinity.

The relocation of the proposed effluent discharge to the proposed site and the introduction of increased loads of contaminated sewage particulates to this area also may contribute to an increase in the prevalence of black gill and shell disease already observed in the lobster in the vicinity of the proposed discharge site (Estrella 1984).

2.C.ii.c. Toxic Pollutants and Biological Impacts

The applicant performed priority pollutant analyses on the effluent in 1979 and 1983. The City of New Bedford analyzed the effluent for PCBs in 1984 and 1985. The concentrations of total PCBs in the 1979 analyses ranged from 9.3 to 21.0 ug/l. In the

applicant's 1983 survey, the PCB concentrations were reported to be below the detection limits of 1 and 10 ug/l. In June, September, and December of 1984 and March of 1985 sampling and analyses of the New Bedford plant effluent and sludge for PCBs were performed by the City as the result of an EPA Administrative Order issued on September 30, 1983, to Cornell-Dubilier Electronics to initiate sewer line clean-up. The 24 hour composite samples indicated PCB concentrations in the sewage effluent ranging from 0.23 to 37.0 ug/l (June); 0.78 to 1.2 ug/l (September); 2.6 to 5.3 ug/l (December) and <0.2 ug/l (March). PCB concentrations in the sewage sludge ranged from 0.5 to 23 mg/kg on dry weight basis according to the above survey. The identified PCBs were Arochlors 1242 and 1254.

The New Bedford sewer study (GCA 1983) indicates that the sewers in the proximity of Cornell-Dubilier Electronics were heavily contaminated by PCBs at concentrations as high as 120 ug/l. The study also indicates that other areas of the sewer system were contaminated at concentrations ranging between 1 and 5 ug/l. Data on the sewer sediment contamination by PCBs (GCA 1983, NUS 1983) also indicate that some portions of the sewer system are highly contaminated and comparatively moderate levels of PCBs can be found throughout the system.

Based on the maximum reported concentrations from the chemical analyses of the effluent performed in 1979 and 1983 (applicant), 1982 (Weaver 1982), 1984 (EPA) and 1984 and 1985 (City of New Bedford), the following table identifies the priority pollutants which would exceed the EPA WQC after the critical initial dilution of 11:1 at the proposed discharge location. Because detection limits for priority pollutants in the applicant's 1983 analyses were much greater than those for EPA recommended analytical methods, pollutants measured below detection limits were assumed to be at detection limit concentrations.

Pollutant	Factor Greater than EPA WQC			
	1979	1982	1983	1984
Cyanide	(11.9)	NA	(1.9)*	(1.4)
Copper	(5.1)	NA	(5.3)	(4.4)
Mercury	(4.9)	NA	(9.6)*	<1
Nickel	1.3	NA	1.3*	<1
Endosulfan	136.8	NA	ND	ND
Silver	<1	NA	1.0*	<1
Lead	<1	NA	<1	(1.7)
PCBs	33.3	8.9(March) 15.6(June)	ND	57.9(June) 1.9(Sept.) ND(Oct.) 8.3(Dec.) ND(March 1985)

EPA WQC have recently been revised for some pollutants and the values in parentheses refer to comparisons with the revised WQC at 50 Fed. Reg. 30,784-30,796 (July 29, 1985).
*detection limit concentration assumed
NA not available
ND not detected

Even after implementation of improvements proposed by the applicant, it is expected that the discharge will continue to contribute to the pollution of New Bedford Harbor and Buzzards Bay. An effective toxics control program would be necessary to reduce the contribution of pollutants to the environment. However, even after implementation of the toxics control program and improvements proposed by the applicant, the Task Force expects that PCBs and copper would continue to be discharged in excess of WQC (see "Toxics Control Program: Industrial Pretreatment" section below). Adverse impacts beyond the ZID related to toxic contamination, such as toxicity, disease and bioaccumulation, are expected.

The 1983 analyses of priority pollutants in the surficial sediments at the proposed outfall, presented in the revised application, indicate that the copper concentration at the proposed site may be higher than expected for clean estuarine sediments (Tetra Tech, Inc. 1984a). The seven Arochlors (PCBs), however, were not detected in the proposed site sediments at detection limits ranging from 0.3 ppm to a high limit of 2.0 ppm.

Proposed improvements, which include extension of the outfall, addition of a diffuser, and reduction of mass emissions, will reduce the applicant's contribution to the PCB bioaccumulation occurring in Buzzards Bay. An effective toxics control program also may lower other pollutant concentrations in the effluent. Although the applicant has identified the sewer system contamination as the source of PCBs and has defined a control plan based on the sewer line cleanup by Cornell-Dubilier, it is impossible at this time to determine to what extent this measure may be effective. The cleanup efforts were completed in November 1984. In December of 1984 the plant effluent exceeded WQC for PCBs by a factor of 8.3 after 21:1 initial dilution. In addition, a survey of the sewer lines in New Bedford indicates that widespread areas of the system are contaminated with PCBs at concentrations ranging from 1 to 5 ug/l (GCA 1983). These concentrations are 1.6 to 7.9 times above the 0.03 ug/l WQC after initial dilution of 21:1. Furthermore, the applicant states in the 1983 revised application that background sewer concentrations are approximately 2 ug/l. Even if hypothetically 20 percent removal of the PCBs was achieved through primary treatment, the effluent would exceed the WQC by a factor of 2.5 after the initial dilution. Therefore, there is a definite potential for continued contamination of the proposed discharge vicinity by PCBs. PCBs and metals are of special concern since these groups of compounds have been implicated in studies pertaining to incidence of fish disease (Committee on Merchant Marine and Fisheries 1983).

The discharge would continue to contribute to toxic pollution and coliform contamination of shellfish at the proposed discharge site (see "Impact of Discharge on Recreational Activities" section below). This may result in an extension of the area closed to the fisheries or retard the recovery of the area from bioaccumulation which has lead to the present fishery restrictions.

In addition, according to the EPA 1985 Water Quality Criteria, chlorine produced oxidants should not exceed 7.5 ug/l after the critical initial dilution of 21:1. This indicates that the level of residual chlorine should not exceed 0.15 mg/l in the treatment plant effluent. To achieve these low levels a dechlorination process may be required.

2.C.ii.d. BIP Beyond the ZID Summary: Proposed Discharge Site

In conclusion, after implementation of the improvements delineated by the applicant (reduction of mass emissions, extension of the outfall with a diffuser, and implementation of a pretreatment program), the phytoplankton and benthic community impacts would decrease. The benthos, however, would still be modified outside the range of natural variability over an area outside the ZID and the discharge would continue to contribute to pollution of shellfish and fishes, extending the area of adverse pollution impacts on organisms, and possibly extending the area of fishery restrictions. The analyses of the existing multi-community ecosystem and impacts such as bioaccumulation and disease prevalence indicate that a balanced indigenous population (BIP) of shellfish, fish, and wildlife did not exist at the proposed discharge site at the time of application and also would not be restored or maintained as a result of the proposed modified discharge.

2.C.iii. Extreme Adverse Impacts within the ZID: Existing and Proposed Sites [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 habitat of limited distribution, or the stimulation of phytoplankton blooms which have far-reaching adverse effects.

There is information presently available to indicate that extremely high levels of PCBs have been accumulated by the biota at the existing and the proposed discharge sites. Also, the results of a Massachusetts Division of Marine Fisheries (1986) survey indicate a high prevalence of non-neoplastic liver lesions (53%) in the winter flounder caught in the area of the existing discharge. While the actual contribution to the PCB bioaccumulation and lesion incidence by the existing discharge cannot be discerned with the available data, the existing New Bedford discharge may be contributing to these extreme adverse impacts on the biota. The relocation of the proposed discharge, therefore, may continue to contribute to the observed extreme adverse impacts.

2.C.iv. Additional Biological Requirements for Saline Estuarine Dischargers [40 CFR 125.61(c)(4)

2.C.iv.a. Benthic Restriction within ZID [40 CFR 125.61(c)(4)(i)]

For discharges into saline estuarine waters, 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 within the ZID has been modified by the existing discharge of approximately 9,325 kg/day (20,558 lbs/day) of suspended solids (based on 1982 data) and the toxic substances associated with these solids. For example, the benthos within the present ZID has a reduced density, diversity, species richness, and evenness, and is dominated by pollution-tolerant species. The magnitude of these alterations is sufficiently adverse to describe the benthos as being substantially altered.

The proposed discharge would have a lower solids mass emissions rate (MER) of 5,110 kg/day (11,266 lbs/day). A reduced solids MER would reduce the impact on the benthos. The proposed discharge site, however, is a depositional environment as evidenced by the high clay, silt, and volatile solids content. The combined effects of a reduced solids MER and a depositional environment could cause within ZID conditions similar to those at the present discharge. Thus, it may be expected that highly and moderately pollution tolerant taxa, such as Capitella capitata and Mediomastus ambiseta, would become dominant. The pollution sensitive species, such as the clam, Nucula proxima, and amphipods, would decline in abundance. It may be expected that total benthic density, species richness and evenness would decrease at the proposed site. Other impacts may include an increase in benthic oxygen demand and sediment flux of heavy metals (Smith et al. 1973; Aller and Benninger 1981). Therefore, the benthic populations within the ZID will differ substantially from benthic populations which would exist beyond the area of impact from the proposed discharge.

2.C.iv.b. Migratory Restriction within ZID [40 CFR 125.61(c)(4)(ii)]

For discharges into saline estuarine waters, the proposed modified discharge must not interfere with estuarine migratory pathways within the ZID.

Pathways of migration have not been adequately documented by the applicant for New Bedford Harbor or Buzzards Bay. The applicant noted that alewives represent an anadromous species that annually migrates up the Acushnet River via the New Bedford 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. The proposed discharge is not anticipated to interfere with migratory pathways because of the small size of the zone of initial dilution relative to the distance between Round Hill Point and Wilber Point (Figure 2).

2.C.iv.c. Bioaccumulation Restriction within ZID [40 CFR 125.61 (c)(4)(iii)]

For discharges into saline estuarine waters, 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 bioaccumulation occurring in Buzzards Bay as described in the preceding sections on "Toxic Pollutants and Bioaccumulation" and "Toxic Pollutants and Biological Impacts". Several toxic priority pollutants were detected in the effluent and are expected to exceed EPA water quality criteria at the proposed discharge site after the initial dilution with ambient water. These include mercury, cyanide, copper, PCBs, endosulfan, nickel, lead, and silver (see "Toxic Pollutants and Biological Impacts" section herein). In 1984, PCBs were detected in the effluent at levels 1233 times the EPA water quality criteria before dilution. In 1979, cadmium, cyanide, mercury, selenium, copper, lead, silver, arsenic, and PCBs exceeded EPA water quality criteria in the receiving water in the vicinity of the existing discharge. Pollution in Buzzards Bay, including PCB contamination, has resulted in the closure of commercial and recreational fishing for shellfish and bottom feeding fish. Although the modified discharge would result in a lower mass emissions, increased initial dilution, and a decrease in toxic pollutants, the resultant effluent would still contribute PCBs and copper to the environment at levels which exceed WQC.

An effective toxics control program is essential to reducing high concentrations of toxic pollutants discharged through the applicant's outfall. The existing New Bedford pretreatment program would fail to meet the EPA water quality criteria for copper, cyanide, mercury, silver, and nickel at the proposed discharge site. Although the pretreatment limits could be adjusted so that most metals of concern would meet WQC at the proposed discharge, the across the board limits based upon economically feasible pretreatment methods would not achieve copper reductions necessary to meet the criterion for this pollutant.

The localized sewer system cleanup by Cornell-Dubilier is not expected to reduce the PCB contamination to meet the WQC, since the background level of PCBs throughout the sewer system is 2 ug/l (City of New Bedford 1983). Therefore, even with the plans for implementation of the toxics control programs, it is expected that PCBs would continue to be discharged in concentrations which would exceed WQC at the proposed discharge site.

The greatest potential for bioaccumulation in the receiving water would be in the vicinity of the proposed discharge. Therefore, the Task Force concludes that ~~toxics would accumulate to levels~~ which would exert adverse effects on the biota within the zone of initial dilution of the proposed discharge.

2.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 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. There is evidence (Collings 1981, Estrella 1983) that the bay also serves as the breeding area for the lobster populations which support a large recreational fishery along the northeast coast.

Pollution has severely impacted fisheries in the New Bedford Harbor and Buzzards Bay. The PCB contamination has resulted in PCB bioaccumulation in shellfish, lobsters, crabs, and fish. Fishery closures in the harbor and the bay have resulted due to this contamination which may be attributable in part to the existing discharge. Relocation of the discharge could 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 fishery contamination problem, which would not allow for attainment and maintenance of recreational activities beyond the ZID.

Since the increased prevalence of lobster black gill and shell disease, potentially resulting from the pollution sources which would include the proposed discharge, may affect Buzzards Bay lobster populations, the recreational lobster fishery in the area beyond the bay may be adversely affected.

Likewise, a high incidence of non-neoplastic liver lesions affecting the winter flounder population from Clark's Cove has been observed. To the extent that the existing discharge is contributing to this adverse impact, relocation of the proposed discharge further into Buzzards Bay waters may increase the prevalence of this condition. The recreational fishermen, therefore, may be affected by a deterioration of the quality of the fishery in the vicinity of the relocated discharge, an area presently not under closure.

Coliform contamination which has resulted in closure of shellfish beds in New Bedford Harbor vicinity may be attributed, in part, to the New Bedford discharge. Improved treatment and disinfection of the proposed effluent should reduce but not completely eliminate the applicant's contribution to this problem. Based on the information supplied by the applicant, the low initial dilution of 21:1 may lead to the exceedence of the Commonwealth's surface water quality criterion that not more than 10% of the total coliform samples shall exceed 230 MPN/100 ml in any monthly sampling period at the proposed discharge site, 314 CMR 4.03(4)(c)(4). Also, projected flows in excess of the treatment plant design capacity of 30 mgd may not receive effective disinfection and would contribute to the excedence of the coliform criterion.

61

2.E. Improved or Altered Discharge Effects [40 CFR 125.61(e)]

Where the proposed discharge is based upon an improved or altered discharge, the applicant must demonstrate that the proposed improvements or alterations to the existing discharge have been thoroughly planned and studied and can be completed or implemented expeditiously and that the improved or altered discharge will comply with the requirements of 40 CFR 125.61(a) through (d).

The proposed treatment plant improvements include the construction of aerated grit removal facilities, a sludge pumping station and tunnel, additional sludge handling systems, and the upgrading of grease and scum removal, sludge dewatering system modifications, and chlorination system modifications. A polymer addition system also has been proposed in the 301(h) application. The information pertaining to this system is limited to laboratory scale data. No proposal for increasing the treatment plant capacity and reducing existing treatment bypass events has been made.

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

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 applicable 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)(2), the applicant's monitoring programs are subject to revision as may be required by EPA.

In summary, the proposed program includes the biological, water quality, and toxics control monitoring components and addresses the major issues. However, each program is deficient in several areas. [redacted] deficiencies and the entire monitoring program can be found in Part III, Section F of the Technical Review Report (Terra Tech, Inc., 1984a). 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.

4. Impact of Modified Discharge on Other Point and Non-point 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 non-point source.

The applicant states that no other discharges are located within 3.2 km (2.0 mi) of the proposed discharge. The closest municipal discharge is from Fairhaven to New Bedford Harbor, approximately 10 km (6.2 mi) away. A letter of September 6, 1984, from Thomas C. McMahon, Director of the Commonwealth's Division of Water Pollution Control (MDWPC), stated that it is the MDWPC's position that the proposed modified discharge "will not result in a more stringent load allocation for any other point or non-point source discharges of wastewater."

The nearest land to the proposed discharge is Round Hill Point, approximately 4.2 km (2.6 mi) away. Therefore, there are no significant land-based non-point pollution sources in the vicinity of the proposed discharge. However, due to the severe problems associated with PCB contamination of marine sediments, New Bedford Harbor was added to the list of Additional Superfund Priority Sites on July 23, 1982, for remedial action addressing hazards related to toxic waste disposal. The proposed discharge could postpone the recovery of the ecosystem despite the future clean-up efforts under the Superfund program.

5. Toxics Control Program: Industrial Pretreatment [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 requirements. Pursuant to 40 CFR 125.64(c)(3), this program is subject to revision as may be required by EPA.

In summary, New Bedford's pretreatment program addresses chemical analyses, industrial pretreatment, and toxic source identification. Upon implementation of the pretreatment program limits, the EPA water quality criteria for copper, cyanide, mercury, silver, nickel, and PCBs are expected to be exceeded at the proposed discharge site. Although the pretreatment limits could be adjusted so that most metals of concern would meet EPA's WQC at the proposed discharge, the across-the-board limits based upon economically feasible pretreatment methods would not achieve copper reductions necessary to meet the criterion for this pollutant. [illegible] would continue to exceed the WQC, since the pretreatment program does not address [illegible] pollutant,

6. Toxics Control Program: Non-industrial Source Control Program [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 and control pro-

grams designed to eliminate the entrance of toxic substances from non-industrial 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)(4), the non-industrial toxics source control schedule and programs are subject to revision as may be required by EPA.

In summary, the applicant provides schedules for the development and implementation of a non-industrial source control program for the service area of the New Bedford POTW. The program outlines the following components: 1) identification of non-industrial toxicants; 2) source quantification; 3) source control analysis; 4) development of source control and source control implementation; and 5) legal and institutional modifications. The schedules specify full implementation of the program within 18 months of issuance of a 301(h) modified permit.

The applicant does not identify non-industrial toxicants of concern nor the probable sources of these contaminants. The program does not specifically address the reduction of the background PCB levels measured in the New Bedford sewers. It also does not address the feasibility of clean-up of the background (2 ug/l) PCB sewer contamination nor the background levels of copper in the water distribution system. The 301(h) Task Force concludes that the non-industrial source control program does not adequately address the existing and projected levels of PCBs and copper in the New Bedford sewer system and the treatment plant effluent. The non-industrial source control program would have to be revised pursuant to 40 CFR 125.64 (d)(4) before a modified permit could be issued, and the resulting compliance with WQC for PCBs and copper can not be assured.

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 modified discharge may not result in any new or substantially increased discharges above the amounts specified in the 301(h) modified NPDES permit. The applicant has furnished data projecting its future discharge volumes and mass emissions based on the performance of the upgraded primary treatment of the plant.

The following are the projected discharge volumes and mass emissions in 5 year increments:

	Effluent Volume Annual Average m^3/sec (mgd)	Mass Loading kg/yr BOD_5	Mass Loading kg/yr SS
1989	1.19 (27.0)	3,022,000	1,865,000
1994	1.28 (29.0)	3,246,000	2,003,000
1999	1.32 (30.0)	3,358,000	2,072,000

The applicant presents a list of forty combined sewer outfalls for the City of New Bedford discharging to Clarks Cove and outer and inner New Bedford Harbor at an annual flow of 1,730 million gallons. Ten of these outfalls are not included in the New Bedford POTW's NPDES permit. Four of the outfalls are continually active as a result of dry weather sanitary flow from contaminated storm drains connected to the outfall. As the result of proposed maintenance of the combined system appurtenances, complete reconstruction of the Belleville Avenue pumping station, and the cleaning of the downstream interceptor sewer, the CSO flows to the receiving waters would be reduced by approximately 9 percent. The increase in projected flow to the treatment system takes into account these measures of CSO abatement. Phase I of a CSO study was completed by the applicant in 1984, although it has not been approved by the state. The City of New Bedford and the Massachusetts Division of Water Pollution Control are due to discuss the scope of work on Phase II of the CSO study in the future.

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COMPLIANCE WITH OTHER APPLICABLE LAW [40 CFR 125.59(b)(3)]

1. Coastal Zone Management Act [40 CFR 125.59(b)(3)]

40 CFR 125.59(b)(3) provides that issuance of a 301(h) modified NPDES permit must comply with the Coastal Zone Management Act, 16 U.S.C. 1451 et seq. In accordance with 16 U.S.C. §1456(c)(3)(A), a 301(h) modified NPDES permit may not be issued unless the state concurs with the applicant's certification that the proposed discharge will comply with the applicable state coastal zone management program approved under the Coastal Zone Management Act or the state waives such certification. The applicant submitted its consistency certification to the Massachusetts CZM Office on March 6, 1984. The Massachusetts CZM Office did not issue a decision within six months of receipt of the certification of September 6, 1984, as required by 16 U.S.C. §1456)(c)(3)(A), 15 C.F.R. §§930.63, and 301 C.M.R. §21.14.

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2. Marine Protection, Research, and Sanctuaries Act [40 CFR 125.59(b)(3)]

40 CFR 125.59(b)(3) provides that issuance of a 301(h) modified NPDES permit must comply with Title III of the Marine Protection, Research, and Sanctuaries Act, 16 U.S.C. §§ 1431-1434.

The applicant states that its proposed discharge is not located in any designated marine or estuarine sanctuary. In a letter of July 1, 1985, N. Foster, Chief of the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration (NOAA), has issued a determination that there are no designated or proposed marine or estuarine sanctuaries in the vicinity of the proposed discharge.

In a letter of June 20, 1985, G. Beckett, Supervisor, New England Area of the U.S. Fish and Wildlife Service, states that the proposed discharge should not adversely affect the endangered and threatened species under the jurisdiction of the Service. However, the letter expresses concerns under the Fish and Wildlife Coordination Act. These concerns relate to the ability of Buzzards Bay to assimilate priority and other non-conventional pollutants discharged via the existing and proposed outfalls and the effects of these pollutants on area resources.

Both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service recommend that the applicant's request for a 301(h) modification be denied. Resolution of issues raised by the July 3, 1935, and June 20, 1985, letters would need to be reached before a section 301(h) modified permit could be granted.

STATE CERTIFICATION [40 CFR 125.59(g)(2)]

Under section 301(h) and 40 CFR 125.59(g)(2), EPA is prohibited from issuing a section 301(h) modified permit unless the state has certified or waived certificaion of the grant of a modified permit pursuant to 40 CFR 124.54. The state has given a favorable determination on the application in a letter of September 6, 1984, from Thomas C. McMahon, Director of Massachusetts Division of Water Pollution Control, to Brian J. Lawler, Mayor, City of New Bedford. The letter, however, states that the certification is subject to the following conditions: 1) that an approved and enforceable pretreatment program for industrial sources of pollutants be implemented by the city to the satisfaction of the Division; 2) that all sewer lines leading to the treatment plant be cleaned or replaced so that PCBs now present in the system are removed to the satisfaction of the Division; 3) that the treatment plant components be adequately cleaned of PCBs to the satisfaction of the Division; 4) that the influent and the effluent of the existing treatment facility be monitored to determine the concentrations of PCBs. The monitoring program is to be approved by the Division and is to include analytical equipment with detection limits for PCBs no greater than 1.0 ppb. In addition, the effluent must be shown to have significant reduction of PCBs to the satisfaction of the Division; and 5) that the treatment facility be operated within the design citeria of the facility and consistently achieve the limits mandated by the NPDES permit.

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