RETURN TO 1998 ROD AR INDEX

16.05

SDMS DocID 000200891

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administratio
NATIONAL OCEAN SERVICE
OCEAN ASSESSMENTS DIVISION
HAZARDOUS MATERIALS RESPONSE BRANCH
c/o U.S. Environmental Protection Agency
Waste Management Division - HSL-3
J.F. Kennedy Federal Building
Boston, MA 02203

31 January 1991

Superfund Records Center
SITE: New Bedford
BREAK: 16.05
OTHER: 200891

Ms. Mary Sanderson
U.S. EPA Waste Management Division
J.F. Kennedy Federal Office Building
Boston, Massachusetts 02203

RE: New Bedford Harbor Superfund Site -- Analysis of Remedial Alternative Recommended for Upper Buzzards Bay - Draft Final Feasibility Study of Remedial Alternatives for the Estuary and Lower Harbor/Bay

Dear Ms. Sanderson:

This responds to your request for NOAA to evaluate its recommended remedial alternative for Upper Buzzards Bay with respect to specific requirements under CERCLA and the nine evaluation criteria set forth in the NCP. Attached is an analysis/comparison of NOAA's proposal to have PCB contaminated sediments adjacent to the Cornell-Dublier facility dredged and disposed of in CDFs, and to cap the PCB contaminated sediments at the Fort Rodman sewerage outfall. The analysis/comparison follows the format set forth in sections 7 and 8 of Volume 2 of the August, 1990, Draft Final Feasibility Study (FS), and relies on much of the information presented throughout the FS. The analysis/comparison should be read in conjunction with the FS and with NOAA's letter of October 30, 1990, which explains in greater detail NOAA's recommended remedial alternative for Upper Buzzards Bay.

Also attached are copies of NOAA's past comments on the various drafts of the FS and other materials used to develop the FS for the Lower Harbor/Bay. This includes a copy of NOAA's letter of October 30, 1990.

Please let me know if you have questions or need further clarification.

Sincerely,

Kenneth Finkelstein, Ph.D

ANALYSIS AND COMPARISON OF REMEDIAL ALTERNATIVE RECOMMENDED BY NATURAL RESOURCE TRUSTEES FOR THE UPPER BUZZARDS BAY SECTION OF THE NEW BEDFORD HARBOR SUPERFUND SITE

January , 1991

To Be Read in Conjunction with
1. the August, 1990
Draft Final Feasibility Study ("FS")
of Remedial Alternatives for the Estuary
and Lower Harbor/Bay New Bedford Harbor
Superfund Site New Bedford, Massachusetts and
2. NOAA's FS comment letter
which includes specific recommendations for
further remedial measures, dated 30 October 1990

Introduction

Analysis and comparison of remedial alternatives is intended to provide sufficient information to select a remedy from the range of proposed remedial actions that meet the following CERCLA requirements:

@ is protective of human health and the environment;

@ attains ARARs (or provides grounds for invoking a waiver);

@ is a permanent solution that uses treatment technologies or resource recovery techniques to the maximum extent practicable;

@ has preference for treatment that reduces mobility, toxicity, or volume as a principal element.

Analysis and comparison of each alternative also includes an assessment of the alternative with respect to the following nine NCP evaluation criteria:

@ short term effectiveness;
@ long term effectiveness and permanence;
@ reduction of mobility, toxicity, or volume of wastes;
@ implementability;
@ costs;
@ compliance with ARARs;
@ overall protection of human health and the environment;
@ State acceptance;
@ community acceptance.

The first five criteria address technical, cost, institutional, and risk concerns. The criterion "reduction in mobility, toxicity, or volume" refers

to reduction in the mobility of contaminants as a function of treatment (e.g., physical, chemical, biological or thermal). While a containment remedy may in fact reduce the migration potential of the contaminants, this is not the same standard as reduction through treatment. Compliance with ARARs and overall protection of human health and the environment are threshold criteria that reflect statutory requirements.

General Description

The alternative presented here calls for the application of dredging and capping technologies to two areas of high PCB concentration located south of the Hurricane Barrier in Upper Buzzards Bay (Figure 1). The technologies were retained for detailed analysis in the FS, and their application in these areas is consistent with the analysis set forth in the FS. Remediation is based on the conclusion that elimination of PCB concentrations in excess of 1 to 3 ppm in these two areas will dramatically enhance the recovery of the biota in Upper Buzzards Bay (area 3 of the biological uptake model and most of areas 5 and 6 of the hydrodynamic model), and will effectively eliminate the major stationary sources of PCB contamination in Upper Buzzards Bay.

From the information presented in the the FS it appears that migration of PCBs from inside (north) of the Hurricane Barrier out (south) to Upper Buzzards Bay and the effect of such migration on the environment south of the Hurricane Barrier is projected to be limited in comparison to the contamination available from the major sources of PCBs deposited south of the Hurricane Barrier. Thus, while comprehensive clean-up (10 ppm TCL - EST 2-6, LHB 2-6; 50 ppm TCL - SW 7-9) in areas north of the Hurricane Barrier would improve the overall environment, such clean-up would likely have little comparative effect on the contamination emanating from the two areas considered under this alternative. In addition, SW-7 would not consider any Lower Harbor or Upper Buzzards Bay remediation while SW-8 and SW-9 would be very limited in these areas. However, a review of the distribution of the sediments in Upper Buzzards Bay indicate that PCB exposure concentrations in Upper Buzzards Bay could be reduced by as much as 50% by isolating the PCBs in the two areas considered under this alternative. Such remediation would significantly reduce human health risks due to the consumption of biota and would dramatically accelerate the recovery of biota in the Upper Buzzards Bay area.

The first area to be remediated is comprised of two "hot spots" (50 - 80 ppm) immediately south of the Hurricane Barrier and adjacent to the Cornell-Dublier facility (the CDE "hot spot"). Total area is approximately 31 acres (FS-Figure 2-4A). The recommended alternative is to dredge this area down to the 1 - 10 ppm level by removing approximately 1 foot of sediment (50,000 cubic yards (cy)) by cutterhead dredge. Dredge materials would be deposited in a CDF in the Estuary or Upper Harbor proposed for several of the other remedial alternatives set forth in the FS. The dredge production rate is estimated to be approximately 400 cy per day (8 hours per day

removing 50 cy per hour), and approximately 137 days (26 days per month) would be required to complete the dredging.

The technological bases and analyses for dredging remediation and disposal are set forth in those sections of the FS related to EST-3 and LHB-3 and are incorporated herein by reference. Specific cost estimates for the CDE "hot spot" are discussed below and in Attachment 2 of NOAA's letter of October 30, 1990, to Mary Sanderson, EPA Remedial Project Manager for the New Bedford Harbor NPL site.

The second area to be remediated is that area enclosed by the 10 ppm contour at the sewerage outfall area off of Fort Rodman. The recommended remedial action is a 3 foot cap covering approximately 4,212,000 square feet (468,000 cy) of contaminated sediment. Using capping material from an upland source, the production rate would be approximately 1000 cy per day, requiring 468 days to complete. Using capping material from areas adjacent to the nearby navigation channel, the production rate of the dredge and capping procedure would be 8,000 cy per day, requiring 58 days to complete. See below for further discussion on capping of this area.

The technological bases and analyses for capping remediation are set forth in those sections of the FS related to EST-2 and LHB-2, and are incorporated herein by reference. Specific cost estimates for the Fort Rodman outfall area are discussed below and in Attachment 2 of NOAA's letter of 30 October, 1990, to Mary Sanderson, EPA Remedial Project Manager for the New Bedford Harbor NPL site.

Short-Term Effectiveness

Short-term effectiveness refers to the effect of the alternative on human health and the environment during implementation.

Dredging of the CDE Hot Spot. Risk to the community is expected to be minimal during remediation. The dewatering and disposal areas will be the same as those discussed in EST-3 and LHB-3 located in commercial and industrial zones, thus, maximizing the use of protective measures and minimizing the potential for contact with the community. Procedures have been developed and tested by the USACE to minimize risks to human health and environmental biota caused by sediment resuspension, contaminant volatilization, etc., during dredging and disposal operations. Protective equipment and clothing would be worn by workers to prevent dermal contact and inhalation of airborne contaminants during sediment dredging and handling. Air monitoring and appropriate air quality controls would be utilized to minimize health risks to workers and the nearby residential community.

The recommended dredging of sediments near the Hurricane Barrier should result in an immediate reduction in human health risk as the

contaminated sediments will be removed and confined. Dredging may cause some initial impacts to the environment. Flora and fauna within the dredging area would be removed along with the sediment and destroyed during the dredging operation. However, it is expected that this area would rapidly reestablish itself, and that this process could be enhanced through a recolonization program. The long term benefits of significantly reduced PCB contamination and PCB bioavailability outweigh the short-term environmental effects which may occur during dredging, or the long-term effects which would remain with a no-action alternative.

Capping the Fort Rodman Outfall. Capping at the Fort Rodman Outfall presents limited risks to human health. There would be minimal or no adverse effects on the community during implementation. Appropriate protective clothing and equipment would be worn by workers to minimize potential health risks. Sediment resuspension during cap construction would be continuously monitored to minimize environmental impacts.

An immediate loss of the benthic community would occur along with some resuspension of PCB laden sediment. However, it is expected that this area would rapidly reestablish itself, and that this process could be enhanced through a recolonization program. The long term benefits of significantly reduced PCB contamination and PCB bioavailability outweigh the short-term environmental effects which may occur during capping, or the long-term effects which would remain with a no-action alternative.

Long Term Effectiveness and Permanence

The long-term effectiveness and permanence criterion addresses the remaining risk after the site has been remediated.

Dredging of the CDE "Hot Spot". Removal and disposal in CDFs of 50,000 cy of sediment at the CDE "Hot Spot" contaminated with > 1 - 3 ppm would remove a substantial mass of PCBs from Upper Buzzards Bay. Remediation of the CDE "Hot Spot" in this manner would result in significant and consistent reduction of PCB flux and water column PCB concentrations in Upper Buzzards Bay compared to a no-action alternative. Improvements would be reflected in the biota which would show reductions in PCB concentrations at a rate significantly greater than that projected under a no-action alternative. The average sediment PCB concentration in the Upper Buzzards Bay Area is estimated to be 3 ppm. It is also estimated that the CDE Hot Spot is contributing an additional 94% to the PCB background level found in the local biota (see Attachment 1 of NOAA's 10/31/90 letter). With dredging a reduction in PCBs in the biota (possibly 46%) could occur in less than 6 months.

Under this remedial alternative PCB concentrations in harvestable biota could conceivably reach acceptable health risk levels (i.e., 0.2 to 0.02 ppm) within a decade and fishery closures may be discontinued. Similarly water

column PCB concentrations would be reduced and direct contact risk to human health would be eliminated. Under a no-action alternative the contaminated sediment would continue to act as a significant source of PCB contamination for the Upper Buzzards Bay area. The reduction in PCB concentrations in harvestable biota would be much slower and it is likely that fishery closures would have to remain in effect for several decades.

Slight risks remain because the contaminants are not treated and the reduction is not permanent. However, confined disposal facility construction is a proven technology and annual monitoring and maintenance would significantly reduce any risks presented by the contained contaminants.

Capping the Fort Rodman Outfall. Capping that area defined by the 10 ppm contour at the sewerage outfall area off of Fort Rodman would effectively contain the flux of PCBs into the water column and would substantially reduce the availability sediment PCBs in this area. The data used to define this area is limited; additional sampling is necessary to better specify the extent of capping. This remedial action would result in significant benefits to human health and the biota compared to a no-action alternative. These benefits would be reflected in the biota which would show reductions in PCB concentrations at a rate significantly greater than projected under a no-action alternative. The average PCB concentration in the Upper Buzzards Bay Area is estimated to be 3 ppm. It is also estimated that the Fort Rodman Outfall is contributing an additional 11% to the PCB background level found in the local biota (see Attachment 1 of NOAA's 10/31/90 letter). With capping of PCB contaminated sediments in this area a substantial reduction in PCBs in the biota (possibly 6% but over 50% along with dredging of the CDE "Hot Spot") could occur in less than 6 months. This positive result is very significant because biota tend to favor the nutrient rich outfall area. However, some area around the immediate outfall would not be capped to prevent damage to the outfall.

Under this remedial alternative PCB concentrations in harvestable biota would conceivably reach acceptable health risk levels (i.e., 0.2 to 0.02 ppm) within a decade and fishery closures may be discontinued. Under a no-action alternative the contaminated sediment would continue to act as a significant source of PCB contamination for the Upper Buzzards Bay area. The reduction in PCB concentrations in harvestable biota would be much slower and it is likely that fishery closures will have to remain in effect for several decades.

Potential risks remain because contaminated sediments remain in place and there is a potential for cap failure. However, capping could be completed in a manner that would address the cap erosion problem, for example, by placing enough material in areas subject to strong storm waves to withstand one or more major storms, backed by a monitoring and maintenance program which calls for the addition of capping material if

and when the cap is eroded. The Fort Rodman outfall area is considered deep enough where storm erosion could be considered in the cap design.

Reduction in Mobility, Toxicity, and Volume

This criterion evaluates the ability of the alternative to permanently and significantly reduce the mobility, toxicity, or volume of the contaminant mass through treatment (e.g., physical, chemical, biological or chemical).

Dredging of the CDE Hot Spot. No reduction in mobility, toxicity, or volume of contaminants would be achieved, because the sediment is not treated. However, disposal of the contaminated sediment in CDFs is expected to reduce the potential migration of PCBs and metals. Long term performance cannot be fully assessed because the possibility exists for leachate migration from the CDFs. Also, the volume of sediment may increase if the sediment is not dewatered prior to disposal. A no-action alternative would not address this criterion because no remedial action would be employed.

Capping the Fort Rodman Outfall. A cap over the sediment would not reduce the mobility, toxicity, or volume of the contaminants because no treatment would be used. However a cap would act as a physical barrier to prevent potential exposure and would be expected to reduce PCB migration from the sediments into the water column. Long-term performance cannot be fully assessed because the possibility exists for cap failure and/or erosion. A no-action alternative would not address this criterion because no remedial action would be employed.

Implementability

The implementability of an alternative includes the technical and administrative feasibility of implementing the alternative, as well as the availability of the technology.

Dredging of the CDE Hot Spot. This removal alternative would require dredging, CDF construction, and water treatment facilities. The technology, equipment and personnel needed to implement these unit processes have been proven reliable and are readily available. An analysis of the implementability of this alternative, as it would apply to the CDE Hot Spot, is set forth in Section 7.4.5 of the FS (pages 7-64 to 7-68) which analyzes the implementability of EST-3 and LHB -3. Although this alternative would require the use of a CDF, the approximate 50,000 cy of sediment to be removed would be accommodated within the CDFs analyzed in the FS.

Capping the Fort Rodman Outfall. The technology exists to effectively cap relatively deep water environments such as the Fort Rodman outfall area. Generally, the implementation of capping in deep water is less complex

than that in shallow water. The area is suitable for capping in that it is not critical to harbor traffic. A brief analysis of the implementability of this alternative, as it would apply to the Fort Rodman Outfall area, is set forth in Section 7.3.5 of the FS (pages 7-30 to 7-32) which analyzes the implementability of EST-2 and LHB-2.

Capping in this area may affect outfall operation and such operations would be taken into consideration during cap design. Likely, an area around the outfall would be left uncapped. Also, installation of a cap in this area will require close coordination and consultation with the City of New Bedford in order to ensure consistency with the City's plans to extend the outfall and/or to dredge some of this area, depending upon the wastewater treatment plant upgrade plans.

Capping is the preferred alternative over dredging in the outfall area as the latter would necessitate use of a large mechanical dredge, resulting in excess material removed and extreme disturbance of the sediments. Capping could be completed utilizing a hopper dredge to obtain 450,000 cubic yards of capping material from areas adjacent to the Harbor's entrance channel. An environmental impact review may be necessary before these sediments could be excavated.

Both dredging and capping would be expected to be administratively feasible, because no off-site construction activities are planned. These alternatives are significantly more complex to implement than a no-action alternative which would involve essentially no construction and no treatment; however the significant benefits to human health and the environment to be derived from these alternatives would outweigh the complexities that might be encountered.

Costs

Costs for the preferred dredging and capping alternatives are given below. Other variations of these remedial alternatives are described in NOAA's October 30, 1990 letter to EPA Region I. Costs for additional sediment sampling and PCB analysis to more accurately determine the areas for remediation have not been included. The total costs for remediating these two areas are less than 5% of the estimated costs for EST-2/LHB-2 (capping) and EST-3/LHB-3 (dredging) and less than 16% of SW 7,8, or 9.

Dredging of the CDE Hot Spot. Two areas immediately south of the Hurricane Barrier. A total area of 1,330,000 square feet of one foot depth would be dredged. This would equal approximately 50,000 cy of sediment. Water treatment costs are based on information provided in the WES report on Pilot Study Evaluation of Carbon and UV/Hydrogen Peroxide Treatment. The other cost data are taken from Report 11 of the Engineering Feasibility Study (a 10 % increase was added to these cost figures). The areas would be dredged using a small cutterhead dredge. The dredge material would be pumped into a scow/barge (3,000 cy capacity) which would then be towed to the upper harbor and pumped out into a CDF. The production rate is approximately 400 cy per day (8 hours per day removing 50 cy per hour) and 137 days (26 days per month) would be required to complete the dredging.

Dredging	=	$75,000/month x 5.3 months	=	$397,500
Scows (2)	=	$20,000/month x 5.3 months	=	$106,000
Tugboat	=	$30,000/month x 5.3 months	=	$159,000
Scow Pumpout Operation	=	$100,000/month x 5.3 months	=	$530,000
Water Treatment assumes 5% solids content)	=	168,180,000/1000 gal x $4.40	=	$739,992
Subtotal			=	$1,932,492
20% Contingency			=	$386,000
TOTAL			=	**$2,318,990**

Design costs associated with the above would include:

1. Additional sampling to better define work area.
2. The design of a facility to dock pumpout scows.

Capping the Fort Rodman Outfall. The area proposed for remediation is that area defined by the 10 ppm contour. PCBs outside this area are between 1 and 10 ppm. An area 4,212,000 square feet would be capped by a 3 foot cap, thereby requiring 12,636,000 cubic feet or 468,000 cy of material. This alternative presumes the use of a hopper dredge to obtain capping material from areas adjacent to the Harbor's navigation channel. This material would be placed over the contaminated area. The production rate (24 hour operation) of the dredge and capping procedure is 8,000 cy/day, requiring approximately 58 days to complete. Some type of environmental study of the dredged area may be necessary; this cost is not included.

58 days x $40,000/day	=	$2,320,000
20% contingency	=	$464,000
TOTAL	=	**$2,784,000**

Design costs associated with the above would include:

1. Additional sampling to better define work area.
2. Additional sampling/study to locate "suitable" cap material.

Compliance With ARARs

This criterion evaluates the alternatives on the basis of how they will comply with ARARs.

Dredging CDE Hot Spot and Capping Fort Rodman Outfall.
The minimal no-action alternatives would not comply with any chemical specific ARARs, and would not trigger any location or action specific ARARs by definition. Presently, Upper Buzzards Bay PCB levels range between 111 and 5 ng/l, with the higher values corresponding to the areas proposed for remediation. If the 1-3 ppm dredging/capping alternative is selected for the CDE Hot Spot and the Fort Rodman outfall it may be assumed that water column PCB levels in these areas will improve significantly below the AWQC level of 30 ng/l. Further remediation of these areas will assure achievement of the FDA tolerance level of 2.0 ppm in lobster and other biota in upper Buzzards Bay well within a 10 year time frame.

Overall Protection of Human Health and the Environment

Overall protection of human health and the environment is a primary, or threshold criteria that must be met by any alternative in order for it to be eligible for selection.

Dredging CDE Hot Spot and Capping Fort Rodman Outfall.
Containment of contaminated sediments in these two areas, by dredge/disposal and capping, would effectively reduce the potential for direct contact exposure and would limit the source of PCB contamination in the water column and biota in the Upper Buzzards Bay area. Reduction of sediment PCB concentrations in these two areas to 1 - 3 ppm would provide an adequate level of protection to human health and a significant reduction in ecological risks over baseline conditions. Under this remedial alternative, PCB concentrations in harvestable biota in the Upper Buzzards Bay area would conceivably reach acceptable health risk levels (i.e., 0.2 to 0.02 ppm) within a decade and are expected to reach the FDA limit (2.0 ppm). Subsequently, fishery closures may be discontinued. Similarly, water column PCB concentrations would be reduced and direct contact risk to human health would be eliminated. Under a no-action alternative the contaminated sediment in these two areas would continue to act as the predominant source of PCB contamination for the Upper Buzzards Bay area. The reduction in PCB concentrations in harvestable biota would be much slower and it is likely that fishery closures would have to remain in effect for several decades.

Potential risks remain because contaminated sediments are not completely destroyed and there is a potential for CDF and cap failure. Also, an immediate loss of the benthic community would occur along with some resuspension of PCB laden sediment. However, it is expected that these areas would rapidly reestablish themselves, and that this process could be enhanced through recolonization programs. The long term benefits of significantly reduced PCB contamination and PCB bioavailability in the Upper Buzzards Bay area outweigh the short-term environmental effects which may occur, or the long-term effects which would remain under a no-action alternative.

State Acceptance

EPA has maintained continuous communications with Massachusetts state agencies (e.g., MADEP and CZM) during the New Bedford Harbor project. Representatives of these state agencies attended monthly status meetings held by EPA and reviewed many interim reports. Comments made by state agencies on the Estuary and Lower Harbor/Bay operable unit will be formally incorporated into the Responsiveness Summary, as part of the ROD process.

Community Acceptance

A Community Work Group has been formed to keep members of the community informed of progress at the site. The group meets on a regular basis and has received several technical and status presentations from EPA over the last two years. The Community Work Group and the general public will have an opportunity to comment on the Estuary and Lower Harbor/Bay operable unit as part of the public review process. Comments received at that time will be formally incorporated into the Responsiveness Summary, as part of the ROD process

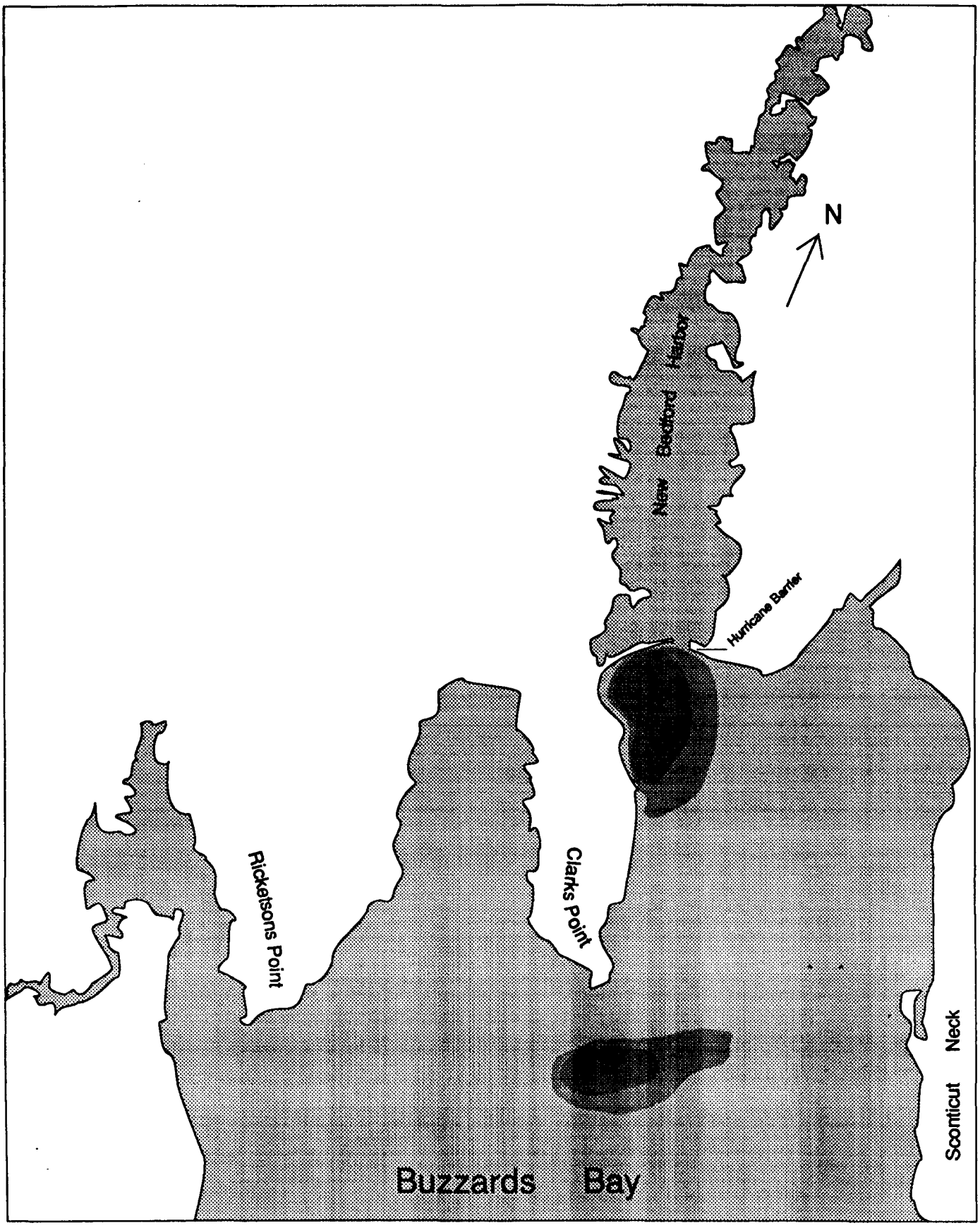

Figure 1. Approximate locations of high concentrations of PCBs in the surficial sediments of the Outer Harbor, New Bedford, Massachusetts. High PCB concentrations are indicated by dark gray areas (greater than or equal to 10 ppm) and by medium gray areas (greater than or equal to 5ppm). Data were redrawn from Figure 5.7 of the modeling report.