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--COMMENTS AND RECOMMENDATIONS-- ON THE DRAFT FEASIBILITY STUDY OF REMEDIAL ACTION ALTERNATIVES FOR THE ACUSHNET RIVER ESTUARY ABOVE THE COGGESHALL STREET BRIDGE

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Years of research, public and private meetings, deliberations, and planning have brought us to this most critical stage in the long process of review and assessment of New Bedford's toxic waste problems - the action phase. As we begin to enter the engineering design and remedial action phase of the clean-up program, there is even greater urgency for the cooperative involvement of all parties - including federal, state and local government officials, private industry, environmental groups and the public.

Everyone's goal is the expeditious removal or capping of PCBs contained in New Bedford's Superfund sites and neutralization of the health impacts which may be posed by PCB contaminants in the city's air, land and water. Toward this end, while it is clear that the most economically feasible option for the hot spot site is hydraulic control and sediment capping, we find we must weigh not only the monetary costs of each clean-up option, but the social, environmental, public health and economic costs as well.

It is imperative that we err on the side of caution when choosing the means of disposing of the PCB contaminated sediments. I quote from a National Wildlife Federation Toxic's Division report:

> "There is mounting evidence that disposal sites receiving toxic wastes cleaned up from abandoned dumps are becoming hazardous themselves. EPA contends that perhaps more than 20 of the 70 sites that have received Superfund wastes may be leaking or have inadequate monitoring for underground pollution. It is conceivable that some of these disposal dumps may end up as new Superfund sites."

Though the costs may be higher in the short term, we have no choice but to opt for the lasting solution to New Bedford's hazardous waste emergency. Failing this, the PCB poisons will surely come back to haunt us.

No Action

I urgently request the "no action" alternative be immediately dispelled from further consideration. I concur with NUS that this option is important only as a comparative baseline for evaluation of the other alternatives. Under no action, PCBs contained in the sediments would remain available to benthic organisms; and through bioaccumulation at each trophic level in the food chain, PCBs would continue to pose a severe health threat to area residents who consume finfish and lobster. Danger from contact with contaminated sediments and inhalation of ambient air would also persist. Equally threatening would be the migration of PCBs from the hot spot area to the outer reaches of the harbor and into Buzzards Bay, resulting in more contamination of our coastal fishery. The marine environment and fishery resource miles from shore would risk contamination from PCBs traveling via normal tidal flows and storm currents out to sea. Should a hurricane equal in force to the 1938, 1944, or 1954 storms hit our coast, there would be a disasterous spread of PCBs into the open ocean.

Over 90% of all marine life spend at least part of their life cycle in coastal bays and estuaries - including New Bedford's inlets and estuaries - adding uncontestable support to the critical nature of the New Bedford contamination. Already the Georges Bank and Grand Bank fisheries are showing signs of contamination from PCBs.

Neutralization of the health impact is number one. Incidental to achieving that goal, remedial action must preclude additional fishing and shellfishing restrictions and facilitate lifting of existing harvest bans.

The particular types of PCBs lining the harbor add to the urgency of choosing some form of clean-up. It is my understanding that Aroclors 1242, 1016, 1254 and 1252 have high chlorine content and hence are potentially more toxic than some of the other PCB types. Allowing these PCBs to remain in the river and estuary under the no action alternative is an unacceptable risk.

We must keep in mind that PCBs are not the only contaminant in the harbor threatening public health. Heavy metals contained in the sediments are equally dangerous and perhaps more so, as their health affects have generally been proven. In cleaning up the PCBs, copper, chromium, zinc, lead, and other toxic heavy metals will also be contained or removed, a secondary and crucial health benefit to the area population.

Selection of Remedial Action Technologies

So the need for some form of clean-up is certain. Criticism is now due NUS's methodology used in development of remedial action alternatives, particularly failure to include in the executive summary the precise parameters within which various technologies were judged.

The last sentence under "Overview of Methodology" in the executive summary, pp. 11-12, reads: "...The most cost-effective alternatives for the remediation of hot spot areas in the Acushnet River Estuary were subsequently identified and recommended..." What is meant by "cost-effective"? How were these identifications and recommendations made? Precisely what considerations were given to health risks and environmental impacts?

I am compelled to raise issue with NUS regarding their statement that "...[a]ll in-situ treatment technologies and PCB separation, removal, and extraction technologies were eliminated because they have not been demonstrated for the intended application. All but one of the PCB destruction technologies were eliminated..." On the contrary, I have read information on the biological detoxification approach to solving hazardous waste problems which infer that toxics separation and biodegradation are viable remedial options currently in use for PCBs. I have been in touch with one out-of-state firm that believes biodegradation would be effective at the New Bedford site. I strongly recommend this clean-up option be more thoroughly investigated, that EPA direct NUS to document and make public criticisms of this technique. Otherwise, exclusion of the biodegradation option may be publicly perceived as a bias and arbitrary ruling by EPA.

Page 14, "Secondary Screening of Remedial Action Technologies", raises still more questions in my mind as to how specific hydraulic control, solids dewatering, sediment dispersal control, and particularly sediment dredging technologies were selected. NUS notes that selected technologies were deemed the "most cost-effective" for use in the development of remedial action alternatives.

Cost must be but one weight on the scale, with equal consideration given to safety and effectiveness. Wouldn't cost, safety and effectiveness considerations - equally weighed - bring us to conclude that suction dredge is the preferred sediment dredging technology? I challenge EPA to support NUS's conclusion that cutterhead dredge is best, that control of PCB dispersal into the water column will be accomplished as effectively as with suction dredge.

Without a clear understanding of the criteria against which action alternatives and technologies are measured, and the level of consideration given to each criteria, it is impossible for the general public to carry out constructive review and evaluation of alternative methods of clean-up. Precisely how were health and environmental risks weighed? I realize the criteria may be spelled out in the complete text of the feasibility study report, however the general public is more apt to review the executive summary and its addendum. At the very least, the reader should be referred to the complete text for more information on how NUS screened technology options.

I cannot over-emphasize the danger in choosing a band-aid solution to the harbor contamination. Hydraulic control and sediment capping, in my opinion, is clearly a band-aid approach to the problem. In terms of cost, it is the most attractive alternative; however numerous other factors make it potentially the most costly over the long term.

First, hydraulic control will necessitate complete alteration of the upper harbor and destruction of the highly productive estuaries. This is unacceptable. We must push for a complete remedy to the environmental impact, not choose action which will cure one problem and create another. All along the Massachusetts coast, estuaries are suffering greatly from point-source toxic and benign waste discharges and non-point source urban and agricultural run-off. Development has completely destroyed numerous estuarine systems. EPA has the opportunity to work against this trend in New Bedford by eliminating hydraulic control from the list of clean-up options, selecting instead a clean-up strategy which will preserve the natural integrity of the Acushnet River estuary.

Secondly, a sediment capped site of that great an area will likely be a burden to the community in years to come, requiring regular upkeep and maintenance work. Furthermore, it appears the PCBs could very easily resurface with time, or they might make their way to the groundwater system. Although aquifers in the immediate vacinity of the harbor and estuary are saline, PCBs might still make their way through the saltwater-freshwater interface over time, contaminating the potential public water supplies underlying New Bedford and area towns.

Third, what is to prevent flooding from occuring upstream from the rock-fill channel? Can the channel depth and embankment height be engineered to guarantee containment of the waters during high tide?

PCB Removal Actions

All the remaining alternatives carry no risk of flooding, would preserve the natural integrity of the upper harbor, boost the health and productivity of the estuaries, and perpetuate the fishery resource north of the Coggeshall Street bridge. No one option is perfect; however, certainly one option may be chosen which best protects public health and the environment over the long term and which is economically feasible as well.

Notwithstanding, I have several criticisms to offer regarding in-harbor containment. Under one option, material will be disposed in an un-lined, in-harbor containment site along the eastern shore. Precisely what are the environmental and health impacts associated with this option? Clearly a large portion of the estuary will be permanently destroyed. Not so clear is whether or not migration of the PCBs will be completely blocked by lining only the walls of the containment area. Does a layer of clay and/or bedrock, impermeable to PCBs, underlie the proposed containment site? Should migration of PCBs occur, are there groundwater reserves near-by which could be contaminated?

Lining the in-harbor containment site, as proposed in a second PCB removal option, would seemingly preclude the possibility of leakage. The added protection may well be worth the higher cost. However, the problem of destroying a large portion of the estuary remains under this alternative. Secondly, how durable is the material from which the liner shall be made? Will it stand the test of time, or will it present problems some years in the future? Accepting the 300-500 year estimated life of the liner runs counter to what should be our goal - to remove the threat not only for this generation but for all generations who follow.

I further question the impact of the in-harbor disposal options on abutting properties and on future development on and near the site. First, to what extent will odors from drying sediments, increased noise levels, and PCB dispersion into the aire threaten the health and safety of near-by residents? Are protective measures planned? Secondly, upon completion of the remedial action, will the capped site be unusable land? What waterfront development and/or activity, if any, will be allowed; what new restrictions will have to be instituted?

Dredging with disposal in an upland containment site spawns questions as to "whose back yard" will receive the harbor contaminants. While I would support restrictions placed on land overlying aquifers, I would not oppose siting a disposal facility at an upland location which meets all existing environmental laws and regulations. The state siting law (General Laws Chapter 21D) would protect any city or town from arbitrary selection as the host community. The primary advantage of upland containment would be preservation of the river estuaries and existing waterfront uses.

Massachusetts is fast approaching the time when hazardous waste produced within its borders must be contained in-state. (This time has already come for low-level radioactive waste). Practically speaking, because of the enormous volume of New Bedford's PCB contaminated sediments and the productive value of coastal estuaries bordering New Bedford, Acushnet, and Fairhaven, in-state upland containment may be the preferred alternative.

Dredging With Disposal in Subsurface Disposal Cells

I laud the reasoning and forsight behind development of the option to dredge and dispose of sediments in subsurface cells, mainly that coastal wetland preservation would be accomplished under this alternative. However, I am compelled to refute the concept because it carries many uncertainties. The most blatant flaw associated with this alternative is the potential for resurfacing of the contaminated sediments over the long term. Constructing five separate disposal cells beneath the estuary waters will present a tremendous maintenance burden for ourselves and future generations. What is to prevent the "upside down cake" from turning "rightside up" over time? It is my belief that the subsurface disposal cell option could evolve into an engineer's nightmare: Both during and after construction, technical problems will inevitably arise. And because containment would be over almost the entire hotspot area, any resurfacing of the PCB sediments would once again transform the entire upper harbor into a chemical quagmire. Area government officials and residents cannot, and will not, accept any remedial action that does not permanently remove the health threat.

On Page 2-18 of the Addendum to the Draft Feasibility Study, NUS notes that the proposed dredging program with disposal in subsurface cells is preliminary and may be amended as more information is gathered. "Subsurface conditions" is named as one characteristic of the harbor about which additional information may be acquired. I wish to stress the importance of establishing a definitive investigation into the subsurface conditions; specifically, what constituents comprise so-called "clean sediments" (are they indeed clean?), and how are groundwater reserves positioned in the sub-strata relative to the proposed subsurface containment cells?

Page 2-21, Step 5, Treatment of Water: What contaminants will the treatment process remove? PCBs as well as heavy metals?

Page 2-22, Step 6, Removal of Temporary Containment Site Embankments: NUS states that "...responsibility for restoration of the wetlands, vegetation, etc. should be resolved during the final design." On the contrary, under any clean-up alternative, responsibility for this critical stage in the remedial action process must be delegated and assumed in the planning stage. Failing this, I forsee the potential for abandonment of the blighted estuary indefinitely. Restoration of the Acushnet River Estuary, from PCB-sediment removal to wetland revitilization, must follow a comprehensive plan which is drafted and finalized (subject to technical amendment) prior to the start of the project.

Section 2.2 of the Addendum evaluates the subsurface disposal cell option in detail, in sharp contrast to the very brief evaluation presented for the aforementioned remedial action alternatives. Why the more detailed treatment of subsurface disposal? To facilitate fair comparison, evaluations made of this option should also be documented for the other options. Hydraulic control and sediment capping, lined and un-lined in-harbor disposal, and upland containment must carry a great deal more environmental, public health, and public welfare implications than NUS's executive summary would lead us to believe. Can these impacts be more fully outlined in the executive summary of Final Feasibility Study Report? Further, can cost-effectiveness measures and project costs be outlined for each option in greater detail?

In subsection 2.2.1, Environmental Effects, dispersal and resolubilization of PCBs from sediments is deemed "...insignificant in relation to the overall effects on aquatic biota. A primary concern is the dispersal of heavily contaminated oily films from the hot-spot areas." My initial question is: Has the ratio of PCBs which will remain bound to dredged sediments vs. the amount which will be dispersed into the water, been determined? NUS simply states "...the PCBs will generally remain bound to particulate matter".

To the contrary, I sense that cutterhead dredging will cause a considerable amount of sediment mixing in the water, resulting in the loss of much of the PCBs to the water column. While the silt curtain may corral some PCB-laden oily films, these films will freely disperse once the curtain is removed. (Absorbant material in the silt curtain will likely provide only minimum containment.) The oil might then resettle into the sediments and/or migrate downstream. Suction dredge would preclude these complications.

Regarding the effects of dewatering (p. 2-24), can volatilization of PCBs and associated impacts be averted by rotating capping of the contaminated sediments, with perhaps, a vinyl cover? Alternating exposure of the sediments will permit drying but the concentration of PCBs released into the air at any one time will be reduced.

Page 2-25: Selection of the subsurface disposal option would require use of a submerged discharge pipe to protect against resuspension and dispersion of the dredged sediments.

Page 2-26, second paragraph: Points made here are not convincing. There are too many uncertainties. First, destruction of the bottom sediment cover and re-oxidation of the waters during dredging operations may facilitate oxidation of heavy metals while contaminated sediments are being discharged into the cells. The oxidized metals might then enter the water column before the clean cap is in place and become available to marine organisms. Second, the mere chance that PCBs may be mobilized as groundwater (fresh or saline) moves laterally through the subsurface cells, poses an unacceptable risk to freshwater aquifers underlying New Bedford, Acushnet, and Dartmouth.

I reiterate that the greatest concern associated with the subsurface disposal option is the potential for wearing of the clean sediment cap. As noted in NUS's report (p. 2-27), wind and wave action and unlawful dredging may expose the contaminated sediments. Fishing drags may also contribute to disruption of the cap. At first the environmental and health impacts may be localized, but over time the impacts will spread.

Page 2-28 to 2-29: Again, I am concerned about airborne contamination associated with drying of sediments at the temporary disposal site. Rotating capping of these sediments would prevent excessive release of PCBs into the air, shielding near-by residents from exposure.

Page 2-30, top paragraph: "Further study will be required to determine the type and level of recreational activity that could be permitted in the areas underlain by contaminated sediments in the cells". I disapprove of imposing any restrictions on normal recreational activity in the upper harbor. Clean-up must improve the safety and quality of the area to a level which allows a return to historic uses. Subsurface containment will not achieve this.

Page 2-30, Level of Clean-up and Isolation Achievable: NUS admits here that "...earlier industries may have used other chemicals in their operations that underlie the PCBs in the sediments." Cell construction will disturb these underlying sediments, and chemicals released into the water will re-settle well after the "clean" cap is in place. Consequently, a new concentrated (and perhaps equally dangerous) "chemical cloak" may cover the harbor bottom following completion of this clean-up option.

Page 2-30, last sentence: Further chemical testing of deep cores is indeed warranted, under any option.

The cost estimate outlined on page 2-32 must be amended to include longterm maintenance and repair, and groundwater and environmental monitoring programs. I estimate these programs will substantially increase the cost of the subsurface disposal option.

Incineration of PCB-Contaminated Sediments

Incineration of PCB material, at least in principle, is the most attractive of all the remediation proposals. Surely no one will argue that destruction of the PCBs would best terminate the health and environmental threat in the upper harbor once and for all. And except for a relatively small amount of ash created, construction of a disposal site in a new area and the resultant transfer of health and environmental risks to that new area, would be avoided. Longterm monitoring, maintenance, and repair of disposal cells would not be necessary under the incineration option.

On page 3-1, NUS is quick to point out that "...the Fast-track Feasibility Study was performed within a time frame that did not permit the completion of a full Remedial Investigation [of incineration]." Yet is appears a great deal of time and effort did go into investigating most of the other alternatives. I am forced to conclude that because review of the incineration option is incomplete, it is therefore inconclusive.

Page 3-1, second paragraph: That "...a PCB liquid having a concentration of PCBs in excess of 500 ppm cannot, according to current regulations, be landfilled" implies that the hot spot sediments must be incinerated. The average concentration of PCBs in sediments north of the Coggeshall Street bridge is greater than 1,000 ppm, often measuring higher than 100,000 ppm. Unless dewatering can effectively remove the liquid component of the sediments, essentially all the other remedial options will be in violation of EPA's own regulations governing landfilling of PCBs.

Beginning on page 3-2, and continuing through to page 3-10, NUS makes its position clear relative to the incineration option. NUS introduces its bias on page 3-2, last paragraph: "Each /mobile rotary kiln/ incineration unit would have to undergo individual testing and permitting, which would undoubtedly be a costly and time-consuming task." First, wouldn't the time required to conduct testing and permitting be acceptable, given that incineration (unlike any other option) would permanently remove and destroy the toxic sediments? Second, exactly what are the costs and time involved? Both monetary and time costs should be documented for comparison.

Page 3-3, first paragraph: What would the initial capital outlay be for a stationary incineration unit? What savings would depreciation and salvaging bring? Again, the costs may be well worth achieving permanent removal of the health threat.

Incineration of only those sediments with PCB concentrations in excess of 500 ppm and disposal of the remaining sediments will: 1) be in keeping with EPA regulations and 2) be less costly and time-consuming. Selective incineration is acceptable, therefore, provided an environmentally-sound land disposal site for the less toxic sediments is chosen.

All in all, stationary rotary kiln incineration seems to be a viable means of disposing of the hot spot sediments. Incineration, by destroying the PCBs, is two steps above containment and one step above the removal options. The health threat will be completely eliminated. As previously stated, long-term monitoring and maintenance will not be required. And the incinerator may actually appreciate in value (i.e. be less costly over the long term) if it is used to burn PCB-contaminated sediments from other sections of the harbor.

I call upon EPA to have NUS more fully investigate incineration. The technology is advanced enough to warrant fair consideration.

All the remedial action alternatives pose certain limitations and adverse impacts. Incineration is no exception. I am most concerned about stack emission products and Massachusetts' lack of approved regulations for contaminant emissions. Has EPA promulgated regulations for toxic emissions which, in the absence of state regulations, would adequately protect people living in close proximity to the incinerator?

It should be noted that although the incinerator will be close to residential and commercial areas, so would the proposed disposal sites -- permanently close. Notwithstanding, the problem of incinerator emissions over the short term is real and must be addressed. That the emission levels will be higher than OSHA approved levels for the work place is of concern. Secondary production of dioxin is a major problem, which perhaps could be eliminated by maximizing the efficiency of incineration. Other chemicals produced during incineration must be contained in some way, and, together with heavy metal residues, receive further treatment or be properly disposed in a secure landfill. Surely landfill capacity required for residual material will be minimal.

A time frame of six to ten years and estimated cost of $100 million are not significant concerns when you consider: 1) the likelihood for time delays under any remedial action alternative, and 2) the permanence of this solution.

Incineration will prove even less costly in the long term if sediments with PCB levels in excess of 500 ppm are incinerated and the rest landfilled.

The problem of fueling the PCB sediment incinerator, as discussed on page 3-9, might be resolved if local residential and commercial waste could be used as fuel. Has this option been considered? A triple benefit could be acrued to the New Bedford area: Waste which would otherwise have to be landfilled would fuel PCB incineration, and energy might be harnessed from the process to generate electricity. My knowledge of the state-of-the-art of this technology is limited, but I offer this to EPA for consideration.

NUS's bias comes through again on page 3-9, Conclusions and Recommendations. The cost of the incineration option is not four times greater than the lined in-harbor containment or upland containment options, which are estimated to cost $79.5 million and $44.0 million respectively. And incineration would not be more susceptible to cost increases than the other options when you consider long term monitoring and maintenance will not be necessary. And the extra time required to complete incineration should be of no consequence because the solution is permanent.

I maintain that incineration is a permanent solution to the in-harbor contamination, because by-products of burning can be treated further, and any materials which cannot be detoxified will have been reduced to a manageable quantity for landfilling. What is the situation in other states where PCB materials have been incinerated? How has the problem of toxic by-product production been addressed?

Disposal at an Existing Out-of-State Landfill

The limitations to siting a chemical landfill in Massachusetts, as noted on page 4-1, would preclude locating such a landfill in the New Bedford regional area. The region's impermeable soils, historically high groundwater table, and proximity to surface waters and groundwater recharge zones appear to be legitimate concerns. But wouldn't the same factors also discount the in-harbor disposal options? NUS's comment, for example, that "... /t/he coastal location of New Bedford and surrounding communities creates direct links between groundwater and surface water systems," infers that all on-site disposal options would be environmentally unsound. And if a chemical landfill anywhere else in Massachusetts (in an upland area with impermeable soils, away from groundwater recharge areas) would not be publicly palatable, how can the on-site disposal options, with all their flaws, possibly earn public acceptance?

For many of the reasons outlined by NUS, I disfavor disposal of the PCB-sediments in an existing out-of-state landfill. CECOS in particular has been recently cited for a number of violations, and choosing to transport the hot-spot sediments to the CECOS landfill may prove to be an unreliable option. CECOS might at any time be closed (there is speculation that leachate from the landfill may be moving toward public water supplies). We cannot risk having to select another clean-up alternative in mid-stream.

Conclusion

Careful review and evaluation of all the proposed remedial action alternatives for the hot-spot area have enabled me to reach several conclusions. First, no one remedial action is clearly the best means of cleaning the upper harbor. Second, no action, hydraulic control and sediment capping, dredging with disposal in subsurface disposal cells, and disposal at an existing out-of-state landfill should be dispelled from further consideration. Third, incineration and/or biodegradation is by far the best option in that both would accomplish permanent removal of the health threat.

But I acknowledge the limitations to incineration and biodegradation, as set forth in the feasibility study. For this reason I propose that if additional investigation into the incineration/biodegradation options concludes that the state-of-the-art for these technologies is not advanced enough, then the best options would be dredging with disposal in a lined in-harbor containment site or dredging with disposal in an upland containment site somewhere in Massachusetts. Under either of these options the PCB contaminated sediments would be contained, for possible removal and incineration at some future time. I believe that someday, if not already, the technology for PCB incineration will be available. In the meantime we would do best to isolate the PCB sediments in a safe containment site which can be carefully monitored and maintained. The idea of temporary containment of the sediments for future destruction, I'm sure, will earn public acceptance.

I hope that all concerns -- my own and those of others -- are carefully considered by EPA. I am confident that the most viable and lasting solution, one which complies with all pertinent environmental laws and regulations, can be chosen -- a solution that is protective of the public interest, health, and of natural resource values.