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## The Providence River Shipping Channel Dredge Project: Its Best Chance for Success is Through Risk Communication

Elizabeth R. DeBlois  
*University of Rhode Island*

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**THE PROVIDENCE RIVER SHIPPING CHANNEL DREDGE PROJECT  
ITS BEST CHANCE FOR SUCCESS IS THROUGH RISK COMMUNICATION**

**by  
Elizabeth R. DeBlois**

A paper submitted in partial fulfillment  
of the requirements for the degree of  
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**Major Paper  
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Approved *R. H. Burroughs*  
**Dr. Richard H. Burroughs**

**University of Rhode Island  
1994**

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## 1.0 INTRODUCTION

Providence harbor and the Providence River shipping channel in Narragansett Bay need dredging to accommodate the shipping interests of the Port of Providence. Federal and State regulations have evolved in such a way that no dredging can be initiated without identifying sites for disposal of the dredge spoil. While officials tackle the problems of dealing with each other and special interest groups, meeting regulations, and evaluating the degree of contamination of the dredge spoil and identifying dredge spoil disposal sites, shoaling continues closing the shipping channel to large carriers and necessitating the practice of lightering loads to accommodate the shallow channel.

Dredge spoils are one of the few remaining categories of materials that, under regulation, can be dumped in the ocean. What then stalemates the process of identifying dredge spoil sites and initiating a dredging program? By default Rhode Island has adopted the "do nothing" alternative for the past twenty years. This apparently is no longer acceptable as an Interagency Task Force has been created by the Governor to develop and implement a dredging plan.

This paper follows the State's latest attempt at

implementing a dredging program for the Providence River Shipping Channel through the efforts of the "Interagency Task Force to Preserve Shipping in Narragansett Bay" (Interagency Task Force). First the specific dredging requirement for Narragansett Bay is summarized. Next using research policy methods the factors impacting dredge spoil site designation are identified. The concepts of risk perception and risk communication are then introduced.

Analysis of the public record shows strong political opposition by select interest groups who subscribe to the "not in my backyard"<sup>1</sup> attitude towards the dumping of contaminated sediments. **It is hypothesized that this opposition is fueled by a high level of risk perception with regard to expected environmental harm in which factors of "outrage" and an inherent distrust of associated regulatory agencies outweigh those based on science.**

Given this conflict between political and scientific opinion it is concluded that the key to the Interagency Task Force's success in its role of resolving the dredging issue and implementing a program lies in the use of risk communication techniques. Finally recommendations for mitigating opposition stemming from risk perceptions through use of risk communication techniques are outlined.

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<sup>1</sup>"NIMBY - not in my back yard has become a sarcastic code implying that opponents approve of siting in principle but oppose it in their neighborhoods for insupportable reasons" (Glickman and Gough 1990).

It is hoped that these resulting recommendations will benefit the efforts of the Task Force in coming to grips with this as yet unresolved problem.

## **2.0 THE PROVIDENCE RIVER SHIPPING CHANNEL DREDGING ISSUE**

### **2.1 PROBLEM STATEMENT**

After twenty years of channel shoaling, two failed attempts at dredge spoil siting, and a U.S. Coast Guard mandated restriction on traffic use of the channel, the Governor's office has assigned the Interagency Task Force the task of writing and implementing a dredging plan. In order to accomplish its task the Interagency Task Agency must 1) define and outline the dredging permit process and 2) identify and mitigate opposition that could delay or halt the dredging process through the vehicles of political pressure or lawsuits.

During the time in which no large volume dredging was undertaken additional regulations with regard to the permitting process, dredge spoil siting, water quality, and public participation have been enacted. The current regulatory process fragments responsibility for funding, project management, and environmental oversight between federal and state agencies which leaves it complex, confusing, and time consuming. The first step however is complete as the Interagency Task Force has done an excellent job of sorting out the different regulatory agency

relationships and jurisdictions and outlined the steps necessary to complete the permitting process. Those efforts are documented in the Interagency Task Force's "Dredging Plan" (Brubaker et al 1993) which is included as Appendix A. In brief the USACE is responsible for dredging the federally authorized channel and for issuing federal permits to non-federal, i.e. the state, city, and private components of the proposed dredging. The material to be dredged is evaluated physically, biologically, and chemically by the USACE, with oversight from the EPA. The National Environmental Protection Act (NEPA) requires disposal options be evaluated in terms of least cost and environmental suitability criteria and subject to public review through an Environmental Impact Statement (EIS). The federal portion of the project needs to be reviewed by the State of Rhode Island Coastal Resources Management Council and the Rhode Island Department of Environmental Management for consistency to state water quality regulations.

The multistaged permitting process is lengthy, consequently any opposition to the dredging program has many points at which it can delay or stalemate the process. If dredging is to occur the placement of contaminated sediments in someone's backyard is inevitable. So in the second step identifying the opposition is not particularly difficult. The opposition consists of fishing and environmental interest groups who don't want contaminated sediments dumped



in their backyards. The environmental groups oppose dumping of dredged material in Narragansett Bay and the fishing groups don't want the material dumped in the ocean. It is mitigating this opposition, in the second step, which has to date been unsuccessful.

The Interagency Task Force's "Dredging Plan" cites two unsuccessful attempts at locating dredged material disposal sites since the last dredging project in 1976. In 1979 the Coastal Resources Center concluded that, "the dredging and dredged material disposal impasse is creating severe economic problems in Rhode Island" (Brubaker et al 1993). And in 1987 a joint effort by the U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) was conducted to identify a permanent disposal facility for Narragansett Bay and Buzzards Bay. That study concluded:

"it is not, at this time, both technically and politically feasible to establish a regional disposal site(s) in Rhode Island Sound as the only option... political will/support/action is not demonstrated" (Brubaker et al 1993, p. 9).

For the Interagency Task Force to be successful in completing the second step, mitigating opposition from fishing and environmental interest groups, it is necessary to understand the nature of their opposition. The hypothesis is that **opposition to in water disposal of contaminated sediments is triggered by factors other than those**

based on scientific findings. The trigger factors are those of "outrage" and an inherent distrust of regulatory agencies responsible for the dredging project.

If this hypothesis can be supported then techniques developed for utilities in effort to mitigate opposition caused by risk perceptions can be tried to mitigate opposition to in-water disposal of contaminated dredge spoil.

## 2.2 CLIENT IDENTIFICATION

This policy research is specifically directed toward the Governor appointed "Interagency Task Force". Per Executive Order 93-4 dated February 15, 1993, the Governor of Rhode Island, Bruce Sundlun, created an Interagency Task Force to Preserve Shipping in Narragansett Bay. The task force was directed to:

- 1) "seek out the advice of those who would be affected by dredging including shellfishing, finfishing, shipping and environmental organizations;
- 2) provide a dredging plan to the Governor by May 19, 1993 and;
- 3) continue to meet regularly after submission of the dredging plan to coordinate implementation of the dredging plan" (Brubaker et al 1993, p. 5).

The dredging plan was released June 17, 1993. The purpose of the plan, in the words of the Interagency Task Force, "is to lay out an aggressive, coordinated strategy for the restoration of the Providence River shipping

channel" (Brubaker et al 1993). Members of the Interagency Task Force include representatives for the director of the Rhode Island Department of Environmental Management, the executive director of the Rhode Island Coastal Resources Management Council, the associate director for the Planning of the Department of Administration, the executive director of the Rhode Island Port Authority, the director of the Rhode Island Department of Transportation, the Rhode Island Governor's director of Policy, and the director of the Port of Providence. Participating in an advisory capacity are the Army Corps of Engineers, the United States Coast Guard, and representatives from the offices of the Senate and the House of Representatives.

It is in the Interagency Task Force's best interest to advocate a dredging program which meets all regulations and to the maximum extent possible satisfies the needs of the different stakeholders, those who have a personal interest in the policy outcome. It should be noted that not all relevant stakeholders are represented on the task force, the glaring omissions are representation from the fishing and environmental interest groups.

The complicated process of designing, securing approval, and implementing a dredging program is not unique to the state of Rhode Island. Neither is the extent to which public participation can effect the process. While this paper is directed to the state of Rhode Island

Interagency Task Force it should be similarly applicable to any other task force dealing with dredging of navigable waterways.

### **2.3 IMPORTANCE OF TOPIC**

The need for dredging results from on-going functions of nature that can not be altered. This means that by postponing dredging the channel water depth decreases. In 1993 navigation in the channel, federally authorized to forty feet deep, was severely restricted by the U.S. Coast Guard (Brubaker et al 1993). As the stalemate continues there is a perception of lost shipping revenue by the industry and increased environmental threat from oil transfer spills or tanker groundings.

In terms of economic value it is estimated that the Port of Providence is "capable of generating over a quarter of a billion dollars annually in economic activity" in personal income, state and local taxes, port revenues, and U.S. customs revenues (Brubaker et al 1993). The lost shipping revenue results from vessels seeking other ports rather than reducing the size of their loads to lessen their drafts to comply with restricted, 35 foot, channel use. According to pilot association member Howard McVay the average tanker coming to Providence carries between 250,000 and 300,000 barrels of oil and will have to lighter off

almost one half of its load into approximately four barges<sup>2</sup> (Carrott, April 15, 1993). Environmental threat from oil spills is perceived as increased from these at sea transfers of oil and as shoaling leaves less margin to accommodate navigational errors to which tanker groundings can be attributed. It should be noted that although one would expect increased spills from the practice of lightering, the United States Coast Guard (USCG) Marine Safety Office of Providence reports that of the 193 oil spills in Narragansett Bay recorded during the years 1986 through the 1st quarter of 1994, none were the result of lightering (USCG 1994).

#### **2.4 HOW RESEARCH WILL CONTRIBUTE TO KNOWLEDGE IN GENERAL**

Since the 1970's attempts at initiating a dredging program for the Providence River Shipping Channel have failed. The primary interest of this paper is to facilitate the dredging of the Providence River Shipping Channel. The secondary interest is to bring attention to the concept of risk communication and its potential for increasing policy effectiveness. Overall policy strategies are often developed at great expense but their implementation is obstructed by the inability to gain public consensus. Risk communication techniques have been used with success in

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<sup>2</sup> The practice of lightering consists of transferring part of a ship's load to other vessels to lessen its own draft.

utility siting, health, and environmental issues. Program initiators need to assume more active roles in project facilitation and understanding risk perceptions and using risk communication techniques is part of the facilitation process.

## **2.5 REVIEW OF RELEVANT RESEARCH**

This study combines work from various fields of research. On-going research into the dredge spoil disposal alternative of capping is conducted by the Army Corps of Engineers New England Division through its **Disposal Area Monitoring System (DAMOS) Program**. A report recently published by the Science Applications International Corporation (SAIC) summarizes their 10 year experience in capping techniques and continued monitoring of capped contaminated sediments in the New England area. The report confirms the viability of capping as a dredged material disposal alternative (SAIC 1994).

While literature pertaining to risk perception and risk communication is not plentiful, enough research has been conducted to constitute these areas of risk assessment as emerging fields of study. Paul Slovic (1991) found that public perception of risk and a profound state of distrust provide basis for overwhelming community opposition to radioactive waste disposal siting. Peter Sandman (1985) found the principal barrier to hazardous waste facility

siting is community opposition and that if the community's power is not acknowledged any attempt at discussion is useless. The concepts of risk perception and risk communication techniques developed to mitigate community opposition to nuclear power plant and hazardous waste facility siting are relevant to the siting of dredged material disposal siting as well.

Ann Majchrzak defines policy research as,

"the process of conducting research on, or analysis of, a fundamental social problem in order to provide policymakers with pragmatic, action-oriented recommendations for alleviating the problem" (Majchrzak 1983 p. 12).

The methods for policy research, outlined in her book, Methods for Policy Research, have been used in defining the dredging problem.

The work of the Interagency Task Force to Preserve Shipping in Narragansett Bay has been invaluable. The "Dredging Plan" and its appendices document much of the necessary background information and they are referenced frequently in this paper. The "Dredging Plan" is included as Appendix A.

### **3.0 BACKGROUND TO THE DREDGING PROPOSAL**

#### **3.1 PROPOSED DREDGING IN NARRAGANSETT BAY**

The current need for dredging in Narragansett Bay has been assessed by the USACE. Refer to figure 1, a chart of

At each of the 14 horizontal clearance is: clearance is 21 feet. sill at the gates is 12.5





the upper Providence River and its surrounding area, for locating specific sites. On February 2, 1993 Col. Brink P. Miller of the USACE reported to Governor Sundlun as follows:

"The lower portion of the channel, from opposite Prudence Island up to Conimicut Point, is at or near authorized dimensions<sup>3</sup>. Above Conimicut Point, mid-channel shoaling is generally from 3 to 8 feet. Shoaling of 6 to 10 feet along the outer edges of the channel have effectively narrowed the channel available for deeper draft vessels. Restoring the full channel dimensions would entail removing about 3 million cubic yards of material" (Brubaker et al 1993, p. 10).

To put this volumetric requirement in perspective three million cubic yards is equivalent to 186 acres, ten feet high. Table 1 presents a history of Providence River Shipping Channel dredging in terms of volume dredged and the year of the dredging activity (Brubaker et al 1993).

Disposal options typically include offshore, nearshore, harbor, inland sites and treatment. Each alternative including the no action alternative, will have environmental, social and cost concerns associated with it. But the options are influenced by the physical nature of and the degree of contamination of the material to be dumped. The extent of contamination is determined by physical, chemical and biological testing.

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<sup>3</sup> The channel is federally authorized to 40 feet.

**TABLE 1: HISTORICAL DREDGING OF SHIPPING CHANNEL SINCE 1949**

| DATE: (Fiscal Year) | VOLUME: (Cubic Yards) |
|---------------------|-----------------------|
| 1949                | 114,908               |
| 1950                | 1,503,709             |
| 1951                | 35,857                |
| 1952                | 494,157               |
| 1955                | 147,934               |
| 1956                | 151,977               |
| 1960                | 63,590                |
| 1961                | 111,410               |
| 1964                | 167,100               |
| 1968                | 2,440,000             |
| 1969                | 2,420,000             |
| 1970                | 2,418,873             |
| 1971                | 2,693,615             |
| 1976                | 100,000               |

SOURCE: Carl Boutilier, Army Corps of Engineers

Results of chemical analysis on fifty core samples taken from Narragansett Bay were reported by the USACE Regulatory Division in December 1992 (Brubaker et al 1993). The core samples were "composited" into fifteen samples labeled "A" through "O" on figure 1<sup>4</sup>. Compositing is a controversial method used in analysis which trades off the high cost of testing with the degree of accuracy required. It consists of combining samples which have been taken from proximate locations and analyzing the combined sample as one. Each composite was tested for metals, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenols (PCBs), total organic carbon, and pesticides. The test results, shown in Table 2, report the parameter tested, the

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<sup>4</sup> Figure 1 was received from the USACE NED. The location of sample "O" is too far south to be shown.

NARRAGANSETT BAY SEDIMENTS  
 SEDIMENT CHEMISTRY TEST RESULTS

| SAMPLE | SUBSTANCE  | MODERATE RANGE* (ppm) | BAY RANGE (ppm) |
|--------|------------|-----------------------|-----------------|
| =====  |            |                       |                 |
| A - D  | As         | 20 - 10               | 22 - 13         |
|        | Cd         | 10 - 5                | 20 - 2.9        |
|        | Cr         | 300 - 100             | 570 - 290       |
|        | Cu         | 400 - 200             | 1300 - 810      |
|        | Hg         | 1.5 - 0.5             | 2.1 - 0.69      |
|        | Ni         | 100 - 50              | 130 - 45        |
|        | Pb         | 200 - 100             | 930 - 330       |
|        | Zn         | 400 - 200             | 1200 - 540      |
|        | Total PCBs | 1.0 - 0.5**           | 3.4 - 2.1       |
|        | 4,4' DDE   | N/A                   | 117 ppb - BDL   |
| E - L  | As         | 20 - 10               | 14 - 8.1        |
|        | Cr         | 300 - 100             | 220 - 110       |
|        | Cu         | 400 - 200             | 560 - 160       |
|        | Hg         | 1.5 - 0.5             | 0.96 - 0.22     |
|        | Pb         | 200 - 100             | 410 - 140       |
|        | Zn         | 400 - 200             | 440 - 190       |
|        | Total PCBs | 1.0 - 0.5**           | 1.0 - 0.22      |
| M - O  | As         | 20 - 10               |                 |
|        | Cd         | 10 - 5                |                 |
|        | Cr         | 300 - 100             |                 |
|        | Cu         | 400 - 200             |                 |
|        | Hg         | 1.5 - 0.5             |                 |
|        | Ni         | 100 - 50              |                 |
|        | Pb         | 200 - 100             |                 |
|        | Zn         | 400 - 200             |                 |
|        | Total PCBs | 1.0 - 0.5**           |                 |
|        | 4,4' DDE   | N/A                   |                 |

\* Rhode Island follows Connecticut guidelines  
 \*\* Based on Massachusetts guidelines

SOURCE: USACE memo CENED-OD-R (1145-2-303b)  
 of 7 December 1992.

range found in the sample, and a guideline "moderate range" used by either the state of Massachusetts or the state of Rhode Island. Samples "A" through "D" were found likely to be unsuitable for ocean disposal, samples "E" through "L" need further testing for suitability for ocean disposal, and samples "M","N" and "O" are considered suitable for unconfined ocean disposal.

Based on the chemical analysis and class designations defined by the EPA, the USACE classifies the sediments to be dredged into the following categories.

"150,000 yds of Class I material suitable for unconfined disposal or beneficial use,

1,400,000 yds of Class II material not suitable for unconfined marine disposal,

1,600,000 yds of material which needs further biological analysis to determine its suitability for open water disposal," (Brubaker et al 1993, p. 15).

Biological testing to further determine the nature of the 1,600,000 cubic yards was conducted in 1993. The biological testing consisted of ten day acute toxicity tests and 28 day solid phase sediment bioassay-bioaccumulation testing of sediment obtained from sites E, F, G/H, I, and J/K in figure 1 (Normandeau Associates 1993). Amphipod toxicity test results are reported as,

"In all cases the difference between amphipod survival in the test sediments and the reference sediments was not statistically significant ( $P > 0.05$ ) and did not exceed 13% in the flow through tests and 7% in the static tests," (Normandeau Associates 1993, p. 11).

Survival data produced by the solid-phase bioassays with

development of any model. Key in this study are the following assumptions: 1) the assumption that dredging the shipping channel is in the best commercial interest of the state of Rhode Island i.e., that the economic benefits outweigh any detrimental impacts<sup>6</sup>; 2) the assumption that dredging may not begin until disposal sites are identified<sup>7</sup>; 3) the assumption that inland disposal is not feasible because of volume and cost constraints<sup>8</sup>; and 4) dredging technology provides a proven in-water disposal alternative, that of capping.<sup>9</sup>

Our society is living with values and ensuing regulations that were born in the 1960's and reflect a movement toward environmental protection. Ocean dumping of any kind including deposit of dredged materials has attained a negative status and this public opinion is as yet

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<sup>6</sup> Note that although cost estimates of Port of Providence productivity were prepared for the Interagency Task Force no cost benefit analysis has been conducted as this is a maintenance project and it is assumed that the analysis from the original project still applies, so this remains an assumption. Also implicit in the name, the Interagency Task Force to Preserve Shipping in Narragansett Bay, is that shipping is the State's top priority.

<sup>7</sup> Barge capacity is between 1,200 and 6,000 cubic yards (rental rates are subject to change) so the possibility of storing dredge spoil until disposal sites are designated is not feasible.

<sup>8</sup> 3,000,000 cubic yards need to be removed and inland disposal typically costs 4 - 12 times as much as unconfined in-water disposal (USACE 1994).

<sup>9</sup> Capping is a method in which contaminated sediment is isolated from the water environment by covering it with non contaminated sediment.

cause, and the associated values and assumptions. Once contributing factors as well as the various stakeholders, those with vested interests<sup>5</sup>, are identified policy researchers can recommend alternative solutions by focusing efforts towards changing those factors most conducive to change.

The general theme is that navigable waterways require dredging and specifically that the Providence River shipping channel requires dredging to maintain its commercial shipping value. The problem, that of delayed dredging, results from lack of consensus as to disposal site location. After consideration of physical, economic, regulatory, and social variables that impact dredge spoil siting the presumed cause is advanced. The presumed cause, which is presented as the hypothesis in the next section, is that opposition to in water disposal of contaminated sediments is triggered by factors other than those based on scientific finding. This coupled with the fact that no Environmental Impact Statement with alternative disposal sites has been written explains why although dredge disposal site options exist there is lack of consensus as to actual site designation.

Recognition of values and assumptions is necessary in

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<sup>5</sup> "Stakeholders are those individuals or groups of individuals who either have some input into the decisionmaking process or are affected by policy decisions on the social problem" (Majchrzak 1983).

clams and worms is summarized as,

"The test sediments did not cause any statistically significant ( $P > 0.05$ ) mortality compared to the reference sediments which had 85% survival for worms and 83% for clams," (Normandeau Associates 1993, p.14).

Bioaccumulation results are summarized as,

"The copper, mercury, PCB and polynuclear aromatic hydrocarbon (PAH) analyses for all clam and worm tissue (controls, reference and test samples) were non-detectable. Detectable levels of chromium, lead and zinc were found in most of the test sample replicates for clams and worms... In summary, statistically significant bioaccumulation of zinc occurred in the clams for test samples E, F, G/H, I and J/K as well as for chromium and lead in Sample E. There was no bioaccumulation potential shown for any parameter of interest in the worm test samples," (Normandeau Associates 1993, p. 17).

Based on these results no decision has been made as to how to classify the as yet unclassified 1,600,000 yds of material. The EPA has requested further sampling and testing which is currently being conducted, (Personal communication, Brubaker 1994).

To summarize the requirement, over 3,000,000 cubic yards of material need to be deposited somewhere and at least 1,400,000 cubic yards of that material are incontestably contaminated. An additional 1,600,000 cubic yards of material may be classified as contaminated as well.

### **3.2 DEFINING OF THE DREDGING DILEMMA**

A method for solving social problems is advanced by Ann Majchzak in Methods for Policy Research. It includes development of a model that bounds the problem by delineation of the general theme, the problem, the presumed

undeterred by scientific input to the contrary.

The difference between the terms "contamination" and "pollution" should be noted. Contamination is the presence of elevated concentrations of substance in the water column, sediments, and/or organisms. Limits of contamination are defined by the EPA and the individual states. Pollution is the introduction by humans of substances or energy into the marine environment resulting in deleterious effects. Perception of pollution is a value judgement of the public.

### **3.3 FACTORS IMPACTING DISPOSAL SITE DESIGNATION**

Dredge spoil siting is influenced by various factors, some more conducive to change than others. This characteristic is termed "malleability" (Majchrzak 1983). The physical, regulatory, economic, and social factors are discussed below in terms of what they are and how flexible they are with regard to their influence on site designation. Physically sediments can be characterized by size and degree of contamination. The physical process of siltation is ongoing and the degree of sediment contamination mirrors the environmental health of the tributaries. During the past twenty years regulation has stopped the dumping of toxic waste into water streams but that waste dumped prior to the regulations contain high amounts of metals, PCBs and PAHs. The nature of the adhesion of contaminants to sediments and the dispersion of sediments into the water column in the



dredging uptake and disposal processes are on-going studies but the physical parameters remain unchanged. The physical aspects with regard to dredging can not be altered, it is the knowledge of how they behave and methods of dealing with them that change and those are discussed as scientific and technological aspects.

Regulation of dredging activities, both federal and state, is not conducive to immediate change. The Providence River Shipping Channel project must comply with current regulations as set forth in the Marine Protection, Research, and Sanctuaries Act (PL 92-532) Section 103 and the Clean Water Act (PL 92-217) Section 404 and the National Environmental Policy Act (PL 91-190), (EPA 1989). With regard to dredging these regulations have evolved in somewhat of a piecemeal fashion the result of which is sometimes lack of definition and consistency. The EPA establishes National Water Quality Criteria to which each State must comply. Additionally States may establish their own water quality criteria which may be more stringent but may not be more lenient than the National Water Quality standards (Schimmel 1994). The water quality criteria is used to determine the suitability of dredged materials for ocean disposal based on chemical, physical, and biological testing. Criteria is such that when materials are dumped, reasonable assurance is provided that no significant undesirable effects will occur due either to toxicity or to

bioaccumulation.

Responsibility of the regulatory agencies for dredging activity is convoluted at best and the reader is directed to the summary provided by the Interagency Task Force in Section V of the "Dredging Plan" in Appendix A. The USACE is lead agency in the federal portion of subject dredging. They are responsible for the sampling, testing, site selection, and Environmental Impact Statement for this project.

The Interagency Task Force has listed the following steps in order to obtain a dredging permit from the USACE: (Carrott, March 11, 1993)<sup>10</sup>.

1. Evaluate materials
2. State provides information to the Corps
3. Corps evaluates and recommends disposal location
4. Corps apply for DEM water permits and CRMC approval
5. Corps seeks comments from Federal Agencies
6. Go out for public notice
7. Corps would prepare formal environmental assessment (pros and cons of what you are talking about), EIS if necessary
8. Funding and contract.

Economic considerations are a factor in site disposal designation and as with physical aspects not amenable to change without technological advances to reduce costs of the different alternatives. The federal government pays for maintenance of federal water ways and the State pays for any additional costs such as upland disposal. As a guide to

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<sup>10</sup> Ms. Carrott transcribed Interagency Task Force meeting minutes. (Carrott, March 11, 1993) therefore references a direct quote from the March 11, 1993 meeting.

approximating costs of dredging/disposal alternatives the following costs are taken from a presentation by USACE. Cost of dredging/offshore disposal, including the capping alternative, is \$5-\$15 per cubic yard. Cost of dredging/inland disposal is \$100-\$250 per cubic yard and cost of dredging with treatment is \$150-\$1000 per cubic yard (Fredette 1994).

The scientific and technological aspects of contamination sampling and dredge spoil isolation techniques have attained a certain degree of reliability and are becoming more sophisticated with time. A surge in environmental monitoring has created baseline data bases of physical, chemical, and biological properties to which subsequent effects from ocean disposal can be compared.

Dredging research is an ongoing activity at the U.S. Army Engineer Waterway Experiment Station in Vicksburg MS and at the New England Division in Waltham MA which leads the Disposal Area Monitoring System (DAMOS) program. DAMOS was instituted by the NED in 1977 to manage and monitor all the open water disposal sites around New England (Carrott, May 16, 1993). Through this program monitoring, dredging, and management techniques are advanced. The role of technical experts is shared by the USACE and the EPA and though technology evolves and new methods are studied the current dredging and disposal techniques must be used for this project.

The social factor includes interest groups and public opinion in general. Specific interest groups identified by the Interagency Task Force include finfishing/shell fishing, environmental, shipping, marine trades, marine labor, and recreation (Brubaker et al 1993). These interest groups are divided into those who support dredging - shipping, marine trades and labor, recreation, and those who oppose dredging - environmental and fishing. The interest of each, with the exception of the environmental groups, is predominantly that of their livelihoods. This makes compromise and consequently change in their positions very difficult. Public opinion changes but as mentioned before an environmental movement that began in the 1970's continues as an awareness today. Included in this awareness is what some consider an overreaction to the indiscriminate use of the oceans in previous decades as a garbage dump. Public opinion is open to change and is subject to influence for example by media coverage of events.

#### **4.0 RISK**

##### **4.1 CONCEPTS OF RISK PERCEPTION AND RISK COMMUNICATION**

In the 1970's environmentalism became a powerful social movement. Beginning with the National Environmental Protection Act of 1969 (NEPA) evolving regulatory policies placed greater emphasis on public participation. The public concept of environmental correctness often differs from that

of the technical experts. Understanding why this difference exists and how to bridge the gap between the two viewpoints has become an emerging theme in public policy. Although the concepts of risk perception and risk communication are not new the study of them as a management technique is. Below they are discussed in terms of their definition and their influence on policy implementation.

### RISK PERCEPTION

Risk perception can be defined as opinion of anticipated harm resulting from a proposed action. It differs from quantitative risk assessment in that it is dependent upon values not analytical methods. As a result perception of risks can differ between those directly facing the risks and the technical experts and policy implementers whose responsibility is to manage those risks. Benjamin and Belluck note that,

"a community's perception that it might be at risk can cause harm to residents even though no significant or measurable health hazard exists and it is therefore, essential to recognize that even though all technical and legal requirements for environmental quality are met, a community can be injured by the anxiety of living in a situation that it views as unsafe," (Benjamin and Belluck 1990, p. 51).

Factors contributing to risk perception have been categorized into patterns. According Sandman, as cited by Santos, public reaction to risk is governed by these factors of "outrage". The term outrage as defined by Sandman "is everything about a risk **except** how likely it is to cause

harm" (Santos 1990 p. 47). The outrage factors affecting the perception of risk are categorized as to whether the risk is:

- \* involuntary or voluntary,
- \* controlled by the system or controlled by the individual,
- \* unfair or fair,
- \* having sources that are untrustworthy or trustworthy,
- \* morally relevant or morally neutral,
- \* artificial or natural,
- \* exotic or familiar,
- \* memorable or not memorable,
- \* uncertain or certain
- \* undetectable or detectable, and
- \* dreaded or not dreaded.

The greater the degree to which the public perceives the risk to be described by the first factor over the second factor the greater harm and the public will assign to the risk which furthers its unacceptability. For example if the risk is considered involuntary rather than voluntary it is perceived as being more harmful. Further description of selected factors as summarized by Santos can be found in Appendix B.

Slovic (1991) focuses on nuclear waste siting his discussion in "Perceived Risk, Trust, and the Politics of Nuclear Waste" but provides insight that can be applied to other environmental issues. Slovic finds that high perceived risk stems from public distrust of technical experts and government agencies not the technology itself (Slovic 1991). Consequently policy may be stalled because of distrust of the regulating agency not the policy itself.

The media plays a role in defining risk perceptions. Often the information that reaches people is true, but only part of the truth. Crawford and Hall note,

"Detecting systematic omissions is quite difficult for lay people. As a result, risk perceptions can be manipulated in the short run by selective presentation. Not only will people not know what they have not been told, but they will not even notice how much has been left out" (Crawford and Hall 1993, p. 81).

The significance of risk perceptions and the most difficult aspect to deal with is that regardless of the accuracy of the perceptions, they are very real and must be dealt with. Santos summarizes and offers a starting point for dealing with them.

"Risk-perception considerations cannot be ignored or minimized as emotional, unfactual, or irrelevant. Emotions, feelings, values, and attitudes carry as much - if not more - importance for the public than the technical magnitude of the risk situation. Utilities must recognize and acknowledge that risk perception is not public hysteria. An appropriate starting point for potential risk communicators might be to determine the risk perception factors at work and how they might affect communication." (Santos 1993, p. 48).

### RISK COMMUNICATION

The concept of risk communication is gaining recognition as a facilitating technique. It is defined by Glickman as the "two-way exchange of information, concerns, and preferences about risks between decision makers and the public (Glickman et al 1990). Plough and Krinsky (1987) assign five components to its definition; intentionality, content, audience directed, source, and flow.

This two-way exchange between decision makers and the public is intended to mitigate the discord between the technical rationality of the risk experts and the cultural rationality of the citizens who must live with the consequences of risk decisions,

"The experts trained and experienced in risk assessment are not always successful in communicating with the general public about how they assess health and safety risks and how their findings should be interpreted. And the risk managers who base their decision on the experts advice sometimes fail to convince the public that risks can be kept to acceptable levels. When risk communication breaks down, concerned citizens may end up feeling treated unfairly, while the risk managers and their expert advisers may think that the public does not understand the problem or is unwilling to cooperate" (Glickman et al 1990, p. 221).

Strategies for risk communication vary. Hall and Crawford (1992) identify four process objectives. Setting realistic goals, safeguarding openness, safeguarding accuracy and fostering competence. The basis for success of the strategy is, "if it raises the level of understanding of relevant issues or actions and those involved are satisfied that they have been adequately informed within the limits of available technology (Hall and Crawford 1992).

Morgan et al conclude, "that the only way to communicate risks reliably is to start by learning what people already know and what they need to know.." (Morgan 1993). Contributing to the poor quality of responses to risk they assert is that,

"managers have not been sufficiently inventive in



developing arrangements that permit citizens to become involved in decision making in a significant and constructive way, working with experts and with adequate time and access to information. Although there are provisions for public hearing in the licensing process...the process rarely allows for reasoned discussion and input usually comes too late to have any effect on the set of alternatives under consideration" (Morgan 1993, p. 41).

In "Getting to Maybe: Some Communications Aspects of Siting Hazardous Waste Facilities," Sandman (1985) outlines techniques that may be used in gaining community acceptance of a nuclear waste disposal site (Glickman and Gough 1990). Those techniques include; acknowledge the community's substantial power to slow or stop the siting process, avoid implying that community opposition is irrational or selfish, help the community rely on its own resources instead of asking for trust, adapt communications strategy to the known dynamics of risk perception, do not ignore issues other than health and safety risk, make all planning provisional so that consultation with the community is required, involve the community in direct negotiations to meet its concerns, establish an open information policy but accept community needs for independent information.

Using as an example the siting of a hazardous waste facility Sandman (1985) divides concerns into impacts of greatest concern; health, property values, image and aesthetics, noise and traffic, inability to keep out other undesirable land uses, economic overburdening, and what he terms "non-impact" issues, those that have no direct impact

other than creating adverse community reaction. The "non-impact" issues include resentment of outside control, not being taken seriously, and unfairness that the community is being asked to pay a high price for the benefit of people who live elsewhere. These non-impact issues are all patterns of risk perception and the techniques described above help to alleviate them.

#### **4.2 DATA AND ANALYSIS CONCERNING RISK**

In order to test the hypothesis that **opposition to in water disposal of contaminated sediments is triggered by factors of "outrage" and an inherent distrust of regulatory agencies rather than those based on scientific findings** the public record will be examined for elements of outrage and distrust and the scientific record will be examined to see if those perceptions are supported.

The data used to assess risk perceptions will be that of public record. The Interagency Task Force met bimonthly from March through June of 1993. The meetings included testimony from interest groups and scientists. Beginning with the second meeting the Interagency Task Force allotted unlimited time after each meeting for public comment. The minutes from those meetings are transcripts. This makes it possible to review the actual statements of participants. A public meeting, held March 13, 1994, to review status of the Narragansett Bay dredging program was attended and later the

tape recording was reviewed. Although a broader base of fishing interests were represented the comments essentially reiterate those made at the Interagency Task Force meeting. And as the text was not available for direct quote the following analysis is based on the transcripts.

The method to assess risk perception is to review the statements made by interest groups and determine what pattern of risk perception motivated them. Readers are cautioned that this is a qualitative and completely subjective analysis. Selected statements are printed and the corresponding risk perception patterns (listed in paragraph 4.1) are then identified, enclosed within parentheses.

**Environmental Interest Group:**

"Dredge material destroys benthic habitat, reintroduces pollutants into the water column, and can kill marine species that are unable to swim away. Ultimately this circles back to the people of Rhode Island. Lobster habitat may be lost, toxins can be passed up the food chain to humans, and recreational value is sacrificed." (artificial, exotic, uncertain, undetectable, dreaded)

"Releasing contamination into the water column is a blatant assault on the environment. Contaminated sediments must be dealt with in the most cautious, conservative manner. It cannot go into the bay. According to DEM regulations, contaminated dredge sediment is considered hazardous waste and must be dealt with appropriately." (morally relevant, dread)

"It is of serious concern to us that there has been discussion about circumventing DEM's regulations prohibiting the disposal of dredge material into Class A waters...it surprises me that this group would consider weakening environmental standards to get their job done." (untrustworthy source)

"(we) are willing to cooperate in finding a solution to the dredging issues we face, but we will not accept unconfined

in-bay disposal as an option. The health of the bay is even more vital to all of us than the depth of the Providence River channel." (morally relevant, controlled by the system)

### **Fishing Interest Groups:**

"Where our problem arises is now you have the material and what do you do with it and when we start talking about the material ending up in an area that we are fishing we view that in a similar manner where you had a potato field and you were going to take the material and deposit it on the field and harvest the potatoes on it. It is not just a matter that we are worried that a biologist five or ten years down the road after this material was deposited in the water site have an enterprising biologist find containments (contaminants) in some of the seafood. We are not just worried about that we are also worried about public perception." (unfair, dread, artificial, uncertainty)

"What I can tell you is that every time there is a message on television about the possibility of contaminants in shellfish, fin fish, or lobsters we reap the negative benefits...We are really quite opposed to taking this material and depositing it someplace where we are going to be harvesting a food resource." (unfair, involuntary)

"My point is that we feel that if we are not going to object to any of the dredging our industry is already going to take a little bit on the chin... We are not the kind of group that goes to the radical sense in that we do not want to see any kind of dredging or any kind of production as far as a marina or something like that. We just feel that we can't allow our industry to be in a position that we are constantly defending the quality of the sea." (unfair)

"There is no fisherman that you are going to meet that will want to see this material near where we are harvesting seafood...I want you all to consider one thing if all of you lived and shopped in my store or Mr. XXXXX's and knew that the two of us here harvesting lobsters close to an area that was going to have dredge spoils dumped how would you like to come in and buy lobsters. I think the public that we are selling to is going to view that the same way...In general we are pretty agreeable to almost anything other than something that is really going to devastate our business." (unfair, dread)

"Here is the other question we have in the fishing business, standards for what is clean keeps going up all the time. When I was in college and I was quahogging to pay my way through, the standards for what was clean water was lower

than what it is now. The standards keep going up and what I am saying is what is clean material today, ten years from now might not be and it might impact on some of these fishing areas." (uncertain)

"What I want to come back to is in-water disposal. I really do not think that it is a great alternative. It is going to impact us regardless of where you put it. Right off the top of my head I can't think of one place I would want to put that in the water where I think it wouldn't impact some marine life." (uncertain)

"I am a lobsterman. I am the fourth generation in my family to be a lobsterman and I am concerned about my son's future. We survived through the last dredging project in the late 60's and there were places, I don't know how well it was controlled, but places where materials didn't reach where it was suppose to. There were several places in Narragansett Bay we lost gear through materials being dumped on us. It also I felt rendered some areas that we use to fish completely counterproductive as far as trying to make a living on this particular area where the dredge spoils were dumped." (unfair, morally relevant)

To summarize the environmental groups hold environmental standards above all other considerations regardless of the cost to society. This stand seems to be partially triggered by the fear that they will have to accept something completely controlled by others and something they will have moral objections to. These patterns may be secondary to what the real risk pattern appears to be, that of distrust of regulatory agencies. The nature of the contaminated sediments elicited elements of dread because of the uncertainty and undetectability of them as well as the their artificial vice natural and exotic vice familiar nature.

The fishing groups appear to respond to the lack of control they have over the siting as well as the unfairness

of any dredge spoil disposal. They consider themselves to be unfairly burdened while the rest of the State of Rhode Island benefits from the dredging. The element of uncertainty of the dredge siting effects threatens not just themselves but future generations as well. A major issue is that the fishing groups believe the public will perceive seafood caught in the area to be contaminated if contaminated material is dumped. This may result from dread of contaminants rising through the food chain or from the threat to their livelihoods.

With both groups, to accept in-water siting would be completely involuntary. These risk perception patterns are the reasons that the interest groups are more opposed to the siting of dredge spoil than what the technical experts believe is warranted. But another factor can be identified as underlying the adamant rejection of in-water disposal and that is the fact that the USACE has not proposed any alternatives. The interest groups are therefore left with considering the worst case scenarios.

#### CAPPING AS A DISPOSAL ALTERNATIVE

The isolation technique of capping has been introduced as an alternative to treatment or containment of contaminated sediments.

"Alternatives for contaminated dredged material are containment options (subaqueous or upland) and treatment. Unresolved containment issues include the availability of space (especially on land) and the degree of isolation that can be achieved... Large-scale facilities for treating contaminated dredging

material do not currently exist in the United States and are expensive to maintain," (SAIC 1994, p. 1).

The expert opinion with regard to capping as an acceptable dredge spoil siting alternative is summarized next. The following summary is taken from a study by the Committee on Contaminated Marine Sediments under the National Research Council in 1989.

"Capping is the placement of a clean material over material considered contaminated. Considerations in evaluation of the feasibility of capping include water depth, bottom topography, currents, dredged material and capping material characteristics, and site capacity. Both the Europeans and the Japanese have successfully used capping techniques to isolate contaminated material in the open-water disposal environment. Capping is also currently used by the COE's New York District and New England Division as a means of offsetting the potential harm of open-water disposal of contaminated or otherwise unacceptable sediments. The London Dumping Convention has accepted capping, subject to careful monitoring and research, as a physical means of rapidly rendering harmless contaminated material dumped in the ocean. The physical means are essentially to seal or sequester the unacceptable material from the aquatic environment by a covering of acceptable material" (Kamlett 1989).

The following remarks are taken from comments to the Interagency Task Force. From Dr. Thomas Fredette of the USACE NED:

In terms of studies that have looked at dredge materials, it is probably one of the most studied substances on earth. It is amazing how much work has been done on it... There are literally shelves and shelves of technical reports that have looked at various aspects of dredge materials, impacts, and how to manage it... There are a number of considerations that you have to have for offshore capping. They are long term stability, transfer losses, endangered species impacts, technique uncertainties although I am a primary supporter of the technique. I feel there are very few

technical uncertainties. It (capping) has been done for 15 years and there seems to be a fair degree of success with it" (Carrott, May 6, 1993).

And most recently Science Applications International Corporation (SAIC) under contract to the USACE has compiled information with regard to capping operations over the past ten years (SAIC, 1994). The study, "Sediment Capping of Subaqueous Dredged Material Disposal Mounds: An Overview of the New England Experience 1979-1993", includes a detailed record of disposal operations and subsequent monitoring of four early capping projects. One of the three viewpoints for which it is written is listed as, "a synopsis of the viability of capping as a dredged material disposal alternative" (SAIC 1994). Factors for viability include physical stability and cap coverage of the mound, benthic ecosystem response and biological recovery rates, and isolation of chemical contaminants<sup>11</sup>. The report concludes:

"Physical monitoring... indicate(s) that capped mounds have been stable even after the passage of three hurricanes. There has been little evidence of erosion or physical breaching of capped mounds. Biological monitoring has confirmed that, in general, there has been no adverse effect on biota due to contaminants located within the mound (exception noted below)<sup>12</sup>. Whole sediment chemistry data...results have shown that contaminant concentrations of surface sediments have

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<sup>11</sup> It should be noted that dispersion of sediment into the water column during the dredging and disposal of sediments is estimated at 10% but this figure is based on dredge type, water depth, and sediment characteristics. It is probably not included here as it is considered a transient i.e. short term response.

<sup>12</sup>one capped mound in particular showed signs of subnormal rates of biological recolonization.



remained near background levels since capping."

Also, "a variety of special "handling" techniques were also introduced to minimize material losses during dredging operations and to maximize long-term containment of sediments and associated contaminants at disposal sites. Clamshell buckets and hopper barges routinely are used to increase the compaction of the sediments (cohesion), thereby reducing the potential for loss of sediment during dredging and transport. Additionally, the use of highly accurate electronic positioning systems and taut-wired moored buoys for precise disposal of material have proved particularly successful" (SAIC 1994).

These judgements as to the viability of capping as a contaminated dredge spoil siting alternative clearly differ from those of the fishing and environmental interest groups. This can be interpreted in two different ways, first that the high risk perceptions of the interest groups are not based on scientific evidence or alternatively that the fishing and environmental groups are not basing their perceptions on the current technology of capping. If this is the case one needs to investigate why this alternative has not been presented to these groups.

Given either alternative the remarks above illustrate that factors of "outrage" and distrust of regulatory agencies influence perceptions toward in-water disposal of contaminated sediments. Concluded is that the hypothesis is supported and the situation does warrant an attempt to bridge the gap between the two opinions.

## 5.0 RECOMMENDATIONS

The final step of the Interagency Task Force's mission is to mitigate the opposition. This section offers specific recommendations based on the risk perceptions identified in the public record and the risk communication techniques outlined. It is important to note that individually each recommendation may seem inconsequential but taken together they foster an attitude that places the environmental health of Narragansett Bay on par with the commercial shipping interest and acknowledges the concerns of the fishing interests.

**1. Change the name and composition of the Interagency Task Force:** The title of the Interagency Task Force, per executive order, is The Interagency Task Force to Preserve the Shipping in Narragansett Bay. This automatically implies that shipping is the objective of the Task Force, not environmental quality, and not protection of RI fishing resources. This places those interest groups immediately on the defensive. The Interagency Task Force has balanced both commercial and environmental considerations in its review of the issues and this impartial attitude needs to be advertised to the interest groups and reflected in its name. An alternative name for example could be the Interagency Task Force to Balance Environmental with Commercial Interests in Narragansett Bay.

Members of the fishing and environmental groups must be

included on the Interagency Task Force. Without representation these groups will feel that policy is first implemented and then forced on them and those feelings will be justified.

**2. Include members of the environmental and fishing interest groups on the Technical Advisory Committee:** One of the management alternatives advanced by the Interagency Task is the gathering of information by a subcommittee.

"A Technical Advisory Committee (TAC) comprised of state and federal resource agencies and other appropriate knowledgeable sources shall map existing resources, uses, and values and shall compile evaluation principles to be used in the selection of dredged material disposal sites. The TAC will also identify what additional information is needed to ensure that a thorough evaluation of disposal alternatives is completed" (Brubaker et al 1993).

It is imperative that the environmental and fishing interest groups be included on this committee as their support of the dredging alternative to be selected is crucial to the success of the program. The political power of these groups must be acknowledged. Excluding them sends messages of, we're not interested in your concerns, you aren't scholarly enough to contribute, and you aren't a force to be reckoned with as well as denies the TAC the opportunity to tap important knowledge of the Bay. A corollary is to give the fishing and environmental groups some control by having them suggest possible sites. Their members know the area well and can bring knowledge to the selection as well as be made to feel part of the decision

making process. Don't repeat the mistake made in the composition of the Interagency Task Force of including port and transportation interests and excluding those of environmental and fishing.

**3. Address specific scientific concerns of interest groups:**

Interest groups may be dealing with inadequate or incorrect scientific information and every effort should be made to replace it with the correct information. For example the percentage of contaminants lost in the water column before reaching the disposal site is believed by the environmental groups to be as much as 40-70% Dr. Armand Silva from the University of Rhode Island on the other hand advances the percentage of 10% (Carrott, April 15, 1993). Efforts should be made to address any concern, quite likely answers may be available from other dredging programs.

**4. Encourage dissemination of dredging technology:** Much work has been done to expand what is known with regard to dredging processes. This information, particularly the success of capping as an alternative, must be disseminated to the public. This has two advantages, it educates citizens and it takes away some of the dread associated with disposal of contaminated sediments.

**5. Dispel distrust of regulatory agencies:** Distrust of regulatory agencies stems more from what they don't tell the public than from blatant mishandling of issues. The USACE NED is in this author's opinion an agency with integrity

backed by the necessary expertise and capable of managing dredge spoil disposal in an environmentally responsible manner. According to Sandman, "a fatal flaw in most governmental public participation is that it is grafted onto a planning procedure that is essentially complete without public input" (Glickman and Grough 1990). He adds "for legal and professional reasons, experts feel a powerful need to do their homework before scheduling much public participation". This creates distrust as the public perception is that they must accept what has not been open to public scrutiny. The Interagency Task Force should encourage the USACE to go public with alternative dredge spoil disposal siting alternatives even in their preliminary stages. Right now the interest groups have been presented with no alternatives, consequently they anticipate the worst case scenario and veto dredging categorically.

6. **Acknowledge impact on fishing groups:** The dredging and placement of spoil has the potential to impact fishing more than any other interest groups. The impact according to a scientific standpoint will not be harmful but it does threaten to cause substantial harm from a psychological standpoint. The Interagency Task Force needs to acknowledge this impact and explore forms of compensation, mitigation or incentives to this interest group. For example offer to start a campaign to increase public awareness to the merits of responsible ocean management of contaminated sediments.

Another measure could be to find out what other states have done to mitigate the perception that contaminated dredge spoils contaminates seafood.

**7. Continue the efforts of the Interagency Task Force with regard to public participation:** Don't let the efforts to date of the Interagency Task Force go to waste! The TAC has conducted meetings but according to Marc Stuart from the Rhode Island Port Authority no minutes have been distributed. The Interagency Task Force has made significant progress in establishing communication with the interest groups and fostering a working relationship. It will take very little to destroy this basis. The TAC must be encouraged to open their meetings to the public, invite public participation, and disseminate information and status of siting alternatives frequently.

## **6.0 CONCLUSIONS**

Providence harbor and the Providence River shipping channel require dredging to accommodate the commercial interest of the state of Rhode Island. An Interagency Task Force has been created by the Governor of Rhode Island to design and implement a dredging program. Contention with regard to placement of the dredge spoils, some of it contaminated, threatens to stalemate the effort.

Legislation enacted in the 1970's increased public participation in issues concerning environmental health.

The result of increased public participation in programs like dredging is that social and political considerations as well as technical considerations influence program outcome.

Technical experts support the siting alternative of capping for in-water disposal of contaminated sediments. Despite this recommendation environmental and fishing interest groups remain firm in their opposition to in-water disposal of contaminated sediments. This work examines the nature of the rationale espoused by these interest groups.

Hypothesized was that rationale behind the opposition stems more from factors of outrage and an inherent distrust in the regulatory agencies than from scientific basis. Analysis of the Interagency Task Force meeting transcripts and scientific reports supports this hypothesis. It was noted also that interests groups are working with limited information.

Use of risk communication techniques in similar siting issues has proved effective in bridging the gap between social and scientific positions. It is recommended that these techniques be employed by the Interagency Task Force. Recommended actions include encouraging dissemination of dredging technology, addressing specific scientific concerns, acknowledging impact on fishing groups, and most importantly inclusion of interest group representation on the subcommittee to recommend siting alternatives.

The Interagency Task Force to date has done an excel-

lent job of securing information and opening lines of communication. The "Dredging Plan" prepared by the group includes an impartial summary of the problem, management alternatives, and a proposed time line for program implementation. As the facilitating agency for the Providence River Shipping Channel dredging program the Interagency Task Force should take responsibility for implementing risk communication measures. Risk communication in the form of a dialogue between regulatory agencies and the public is the only way to avoid a stalemate.





Bruce Sundlun  
Governor

State of Rhode Island and Providence Plantations  
EXECUTIVE CHAMBER, PROVIDENCE

# Interagency Task Force To Preserve Shipping in Narragansett Bay

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*Dredging Plan*

June 17, 1993

MEMBERS OF THE INTERAGENCY TASKFORCE.

Alicia M. Good      Representing Louise Durfee, Director of the  
Department of Environmental Management

Jeff Willis          Representing Grover Fugate, Executive Director  
of the Coastal Resources Management Council

John O'Brien        Representing Daniel Varin, Associate Director  
for Planning of the Department of  
Administration

George A. Prete     Representing Joseph Paolino, Executive Director  
John Riendeau        of the Rhode Island Port Authority and  
Economic Development Corporation

Ed Parker           Representing Dante Boffi, Director of the  
Rhode Island Department of Transportation

Brian Gallogly      Representing Governor Sundlun's Policy Office  
Kevin Brubaker

Thomas O'Connor    Executive Director, Port of Providence

Advisory Members

Carl Boutilier      U.S. Army Corps of Engineers

Patricia Misch      U.S. Coast Guard

Kenneth Payne       Office of Senator Claiborne deB Pell

Jim Barden          Office of Senator John Chafee

Donald Driscoll     Office of Representative John Reed

Craig M. Grant      Office of Representative Ronald Machtley

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## EXECUTIVE SUMMARY

The Interagency Taskforce to Preserve Shipping in Narragansett Bay was created by Governor Bruce Sundlun in February, 1993 by Executive Order. Comprised of state and federal agencies responsible for regulating and conducting dredging and representatives of Rhode Island's Congressional delegation, the Taskforce was charged with providing a dredging plan to the Governor; and overseeing its implementation. The Taskforce met biweekly over a 4 month period, hearing testimony from various interests affected by dredging, including fishing, shipping, and environmental organizations. This report summarizes the information learned by the Taskforce and presents an ambitious plan to carry out dredging of the Providence River shipping channel and related facilities.

The Taskforce finds that:

1. The Providence River shipping channel has shoaled significantly since it was last dredged twenty years ago. This shoaling has adversely affected shipping, a sector which contributes significantly to the Rhode Island economy.
2. There is an economic and environmental need to dredge the shipping channel and related port facilities and restore the federally authorized depth of 40 feet.
3. The primary statutory authority for maintaining the shipping channel rests with the U.S. Army Corps of Engineers, which undertakes dredging projects at the behest of the State.
4. There are federal and state regulatory requirements which must be met if dredging is to occur.

The Interagency Taskforce recommends the establishment of a federal and state partnership to manage the dredging project and to meet environmental protection requirements. The Taskforce proposes an aggressive timetable of engineering, permitting, and purchasing activities between July, 1993 and December, 1994 which, if followed, will allow dredging to begin in January, 1995.

The Taskforce will continue to meet regularly in order to make every effort to ensure that this timetable is followed.

## I. INTRODUCTION

In answer to a February, 1992 request from Governor Bruce Sundlun, the United States Army Corps of Engineers has completed a hydrographic survey of the Providence River shipping channel. That survey concluded that restoring the shipping channel to its authorized depth would require the dredging of about 3 million cubic yards of material. Based on this finding of severe shoaling, the United States Coast Guard restricted vessel traffic in the shipping channel in February, 1993.

The Interagency Taskforce to Preserve Shipping in Narragansett Bay was created on February 15, 1993 by Executive Order 93-4. Governor Sundlun charged the Taskforce with three specific tasks:

1. To seek out the advice of those who would be affected by dredging, including shellfishing, finfishing, shipping, and environmental organizations;
2. To provide a dredging plan to the Governor by May 31, 1993;
3. To continue to meet regularly after that date to coordinate implementation of the dredging plan.

Through regular meetings, the Taskforce familiarized itself with the regulatory, technical, and environmental issues concerning the preservation of the Providence River shipping channel. The minutes of those meetings are incorporated herein as appendices to this report. Through both formal presentations and informal dialogue, the Taskforce accomplished the first task set forth by the Governor.

This document, the result of the Taskforce's deliberations, is in answer to the Governor's second assignment. Its purpose is to lay out an aggressive, coordinated strategy for the restoration of the Providence River shipping channel to its authorized depth of 40 feet. Because of the need to address the impact of the Coast Guard action, this dredging plan is meant to solve the immediate shoaling problems in the Providence River shipping channel and related port-facilities. The Taskforce realizes that a long-term dredging management plan is necessary to prevent another crisis from occurring by providing for the systematic dredging needs of the state and marine related industry. The successful conclusion of this dredging plan will provide for agreements and organization necessary for the preparation of a long-term management plan and subsequent approval of future dredging projects as the need arises. The Taskforce recommends the writing of such a long-term dredging management plan when this project is completed. The Taskforce should continue to meet to develop a long-term management plan.

## II. BACKGROUND

Ever since Roger Williams established a trading post on the shores of Narragansett Bay, marine transportation has been an integral component of Rhode Island's economy. As shallow draft canoes and barges gave way to larger oceangoing vessels, the creation and maintenance of shipping channels became necessary. In 1853, the United States Congress authorized the U.S. Army Corps of Engineers to maintain these federal navigation channels. Through regular dredging, these channels were maintained and, over time, deepened to accommodate larger vessels.

TABLE 1: HISTORICAL DREDGING OF SHIPPING CHANNEL SINCE 1949

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| <u>DATE</u> (Fiscal Year) | <u>VOLUME</u> (Cubic Yards) |
|---------------------------|-----------------------------|
| 1949                      | 114,908                     |
| 1950                      | 1,503,709                   |
| 1951                      | 35,857                      |
| 1952                      | 494,157                     |
| 1955                      | 147,934                     |
| 1956                      | 151,977                     |
| 1960                      | 63,590                      |
| 1961                      | 111,410                     |
| 1964                      | 167,100                     |
| 1968                      | 2,440,000                   |
| 1969                      | 2,420,000                   |
| 1970                      | 2,418,873                   |
| 1971                      | 2,693,615                   |
| 1976                      | 100,000                     |

SOURCE: Carl Boutilier, Army Corps of Engineers

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As seen above, no significant dredging of the Narragansett Bay shipping channel has occurred since 1971, when the Brenton Reef disposal site was closed. However, sedimentation has

continued. Various studies have concluded that maintenance of federal channels in Narragansett Bay requires between 20,000 and 70,000 cubic yards per year of maintenance dredging (EPA, 1987; Delivery 2). In 1989, the Northeast Pilots Association voluntarily limited the draft of vessels to 38'6" entering Providence due to shoaling.

In addition, the absence of readily available disposal locations has discouraged numerous private marinas and port facilities from conducting maintenance dredging. According to the Rhode Island Marine Trades Association, there is currently a backlog need to dredge about 750,000 yards of material from private marinas.

Over the last two decades, there have been numerous attempts to locate dredged material disposal locations. In 1979, the CRMC hired the Coastal Resources Center to prepare a report on dredging "as a first step toward breaking the present impasse and finding the long-term solutions to the dredging problem that this state so sorely needs" (Seavey & Pratt, 1979, p. 12). That report concluded that "the dredging and dredged material disposal impasse is creating severe economic problems in Rhode Island [p.9]."

Most recently, in 1987, the EPA and Army Corps jointly formed a Regional Disposal Steering Committee and a Regional Disposal Advisory Group to attempt to site a permanent disposal facility for Narragansett and Buzzards Bay. Though the Advisory Group



found that "shoaling interferes with navigation, adversely affects marine-related commerce, and is expected to worsen until maintenance dredging resumes," it concluded that "it is not, at this time, both technically and politically feasible to establish a regional disposal site(s) in Rhode Island Sound as the only option..." and that "political will/support/action is not demonstrated." Though the Advisory Group went on to make numerous recommendations, there has been little follow-up, and the shoaling problem continues to worsen.

On February 24, 1992, Governor Bruce Sundlun, in response to growing concern over the channel, formally asked the Army Corps of Engineers to initiate a dredging project for the maintenance of Providence Harbor and the shipping channel. The Governor went on to state that:

"Recognizing that designation of a dredge spoils disposal site is a necessary component to this project, I suggest that the Army Corps begin its work with an evaluation of the quantity and quality of sediments which must be dredged. My hope is that a full range of in-water and on-land disposal options be considered.

"While dredge spoil disposal has proven contentious in the past, it is my firm belief that the issue can be resolved through open dialogue. As a matter of policy, it is far better to begin this discussion now than to wait until the need for harbor and channel dredging reaches a crisis."

On April 21, 1992, Colonel Philip R. Harris of the Army Corps replied to Governor Sundlun, in part, that "our goal for this year is to complete a hydrographic survey of the entire federal channel and sampling and testing of the material in areas which need to be dredged. With the results of the survey and

sampling, we will be in a better position to assist the State in identifying potential disposal sites."

On February 2, 1993, Colonel Brink P. Miller of the Army Corps of Engineers reported to Governor Sundlun as follows:

"The lower portion of the channel, from opposite Prudence Island up to Conimicut Point, is at or near authorized dimensions. Above Conimicut Point, mid-channel shoaling is generally from 3 to 8 feet. Shoaling of 6 to 10 feet along the outer edges of the channel have effectively narrowed the channel available for deeper draft vessels. Restoring the full channel dimensions would entail removing about 3 million cubic yards of material. However, the extent of needed dredging depends on the depth and maneuvering requirements of existing and reasonably prospective commercial vessel traffic."

As a result of these findings, the United States Coast Guard issued emergency regulations on February 19, 1993 establishing a safety zone in the Providence River and restricting vessel operations in the shipping channel. This regulation restricts vessels with drafts of over 35' from entering the channel without taking special precautions. Specific restrictions include:

"(1) All commercial vessels transiting the Providence River Channel shall be limited to a maximum draft of 35 feet at average mean low water. Vessels with drafts between 35 feet and 38 feet may transit the Providence River Channel at times other than mean low water provided there is sufficient depth under the keel to prevent the possibility of grounding. Any commercial vessel with a draft in excess of 38 feet will require specific permission of the Captain of the Port, Providence....

(2) Commercial vessels over 65 feet in length are prohibited from passing, meeting, or overtaking in the Providence River Channel...."

These restrictions will remain in effect until such time as the channel conditions are determined to have further deteriorated

when additional measures will be considered or the channel is restored to its project dimensions by dredging.

### III. THE NEED FOR DREDGING

Rhode Island's port facilities are an important segment of the Rhode Island economy. The economic benefits generated by the Port of Providence are summarized in the following table:

TABLE 2: Economic Benefits of the Port of Providence, 1987

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| <u>Benefits</u>                       | <u>Public</u> | <u>Public and Private</u> |
|---------------------------------------|---------------|---------------------------|
| <u>Job Impacts</u>                    |               |                           |
| Direct                                | 776           | 1,436                     |
| Induced                               | 335           | 1,436                     |
| TOTAL 1,111                           | 2,055         |                           |
| <u>Personal Income (millions)</u>     |               |                           |
| Direct                                | \$22.4        | \$ 41.8                   |
| Respending                            | \$16.1        | \$ 31.8                   |
| TOTAL                                 | \$38.5        | \$ 73.6                   |
| <u>State/Local Taxes</u>              | \$ 4.0        | \$ 7.4                    |
| <u>Revenue</u><br>(Excluding Customs) | \$92.9        | \$157.0                   |

SOURCE: Narragansett Bay Ports Study, Final Report, Martin O'Connell Associates, 1989(?), p. III-8.

NOTE: The methodology used to prepare this table, as well as additional information on the economic benefit of the Port of Providence, is provided in Appendix 3.

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Another recent study of the Port of Providence [International Trade Task Force, 1992] concluded as follows:

"After reviewing the results of the economic impact statement, one realizes that the Port of Providence is a tremendous resource. The total public impact, that amount

which is derived solely from the presence of the port, in 1991 was \$40 million dollars. This means that the Port is one of the few public direct-revenue sources. In addition, its impact to the immediate region is one of the greatest of all facilities in the state. Perhaps more important is the fact that the Port acts as a catalyst for commerce and industry. Waterborne transportation is still the cheapest mode of carriage and is, therefore, one of the first natural resources sought when marine/industrial development is anticipated. Many sources point to transportation as being the single largest driving force behind economic growth. The Port of Providence has the ability to attract additional investment that would translate into millions of dollars in jobs, tax revenues, and other business income."

The Taskforce learned from the Northeast Pilots Association that shipping activity has been restricted by shoaling of the Narragansett Bay channel. This was confirmed by the U.S. Coast Guard. Specifically, lightering of oceangoing vessels onto smaller barges has become commonplace, significantly increasing the risk of petroleum spills. Testimony from the Marine Pilots Association before the Taskforce underscored that point:

"By having a channel that is considerably shallow we are somewhat eliminating double hulled tankers at this time from coming up to Providence. It also means that the tankers have to lighter in Jamestown anchorage, the only place we can do it in the state, and the average tanker coming to Providence now carries between 250,000 and 300,000 barrels. It will have to lighter off almost one half of their product into approximately four barges. Now you are going to have four barges going in versus one tanker coming in. We have an increase of risk of navigational errors in addition to the fact that you are transferring oil from a tanker into a barge....Safety wise over the years, since it was initially dredged, we have lost quite a margin."

- Captain Howard McVay

This shift in shipping practice has economic as well as environmental costs. According to one commercial dock owner:

"During 1992 our dock handled more than 40 vessels but, due to draft limitations, each vessel was "short loaded." Short loading vessels costs about \$.30/barrel and such increased costs, about \$600,000, eventually get passed on to our customers, the industries and homeowners of Rhode Island."

For the state as a whole, one industry representative has estimated that the requirement to lighter shipments adds approximately \$3.4 million dollars annually to Rhode Islanders' energy bills. Moreover, because the Port of Providence cannot accommodate modern tankers, some of the petroleum products destined for Rhode Island are diverted to deep water ports in Massachusetts and Connecticut and are transported to the state via tank trucks. This method of delivery, by one estimate, increases the cost of the product by \$.03 to \$.05 per gallon. Moreover, it results in significant increases in truck traffic, resulting in additional air pollution and risk of traffic accidents. (This is detailed in Appendix 4.)

The Taskforce learned through testimony that virtually every marine terminal in Providence Harbor is prepared to dredge its berth to 40' of depth if the Providence River channel is so dredged. They have stated unequivocally that this entire depth would be used if it were available. This need for depth is increasing over time, since modern double-hulled petroleum tankers have an even deeper draft than their older counterparts.

Without exception, interest groups invited to testify before the Taskforce agreed that dredging of the shipping channel is

necessary. The Taskforce agrees with this conclusion. The Taskforce therefore recommends that dredging occur to reestablish a 40' navigation channel in Narragansett Bay.

Additionally, the Taskforce finds that related non-federal dredging must also occur as part of this project. The state of Rhode Island and the cities of Providence and East Providence have standing agreements with the Army Corps that they will provide and maintain berthing areas at depths commensurate with the channel depth. Private commercial port facilities served by the Providence River shipping channel must also be dredged in order to make the federal dredging project worthwhile. These facilities are reportedly eager to cooperate.

#### IV. DREDGED MATERIALS DISPOSAL

The overriding problem preventing dredging in Rhode Island has been the lack of available acceptable sites for the disposal of dredged materials. As noted earlier, large scale dredging has not occurred in Rhode Island since the early 1970's.

Though the Army Corps has not completed its analysis of the materials shoaling the shipping channel, preliminary evidence suggests that much of the material is contaminated to varying degrees. According to George Seavey [1979]:

"Upper Providence River surface sediments are contaminated with very high levels of volatile solids, zinc, copper, and lead. There are moderately high levels of most other pollutants with the exception of oil and grease. Subsurface sediments, although still warranting a class III designation, show a consistent decrease in all pollutants. Cores taken from near Conimicut Point have

sandier sediments than the upper channel and have consistently low metals levels. Moderately high water content prevents more of these sediments from being placed in Class I. In some cases, metals content increases with core depth, indicating that bottom currents have probably recently brought in cleaner sandier sediments."

The Army Corps estimates that about 3 million cubic yards of material requires dredging in order to restore a forty foot channel depth. Preliminary tests by the Army Corps (detailed in Appendix 5) suggest that the material is of the following quality:

- 150,000 cubic yds of material suitable for unconfined disposal or beneficial use;
- 1,400,000 cubic yds of material not suitable for unconfined marine disposal;
- 1,600,000 cubic yds of material which needs further biological analysis to determine its suitability for open water disposal.

Historically, Providence River dredged material has been disposed of in the open water. Past studies of disposal alternatives have failed to identify a feasible alternative. The Taskforce learned from fishing and environmental organizations that many are still concerned over in-water disposal. This may be seen in Appendix 2.

## V. AGENCY RESPONSIBILITIES AND REGULATORY FRAMEWORK

The overall intent of regulations and requirements applied to dredging is to ensure that all relevant impacts are considered. Whether or not dredging is performed in a given case is determined based on an evaluation of the probable impact of the proposed activity on the public interest and the environment. That decision reflects the national and local concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal are balanced against its detriments. All factors which may be relevant to the proposal are considered; among these are conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use classification, water quality classification, and the welfare of the people.

From a regulatory perspective, the Providence River dredging project has two components - federal and non-federal dredging. The federal component consists of the dredging of the federal navigation channel by the Army Corps of Engineers. That component and the issuance of federal permits for the nonfederal component are guided by the National Environmental Policy Act (NEPA) whereby the Army Corps prepares an environmental assessment of the project then seeks review of the assessment by federal and state agencies and the public. The non-federal component consists of the dredging of related



city, state, and private facilities served by the federal channel. Though their dredging will be included in the environmental assessment, these parties must apply for state and federal permits to conduct dredging.

The descriptions that follow are meant as a brief explanation of the regulatory process and are not a substitute for the actual statutes and regulations.

#### A. UNITED STATES ARMY CORPS OF ENGINEERS

The "commerce clause" of the U.S. Constitution makes regulation of interstate commerce a federal responsibility. Ports and channels are a vital part of the system of moving commodities within the United States. Thus channel maintenance for the purposes of interstate commerce is a federal responsibility, which has been delegated by statute to the Army Corps of Engineers. The Providence shipping channel is federally authorized to a depth of forty feet.

In addition to its responsibilities for improving and maintaining Federal river and harbor projects through dredging, the Army Corps of Engineers (Corps) is responsible for regulating dredging and disposal of dredged material by others. In either case the goals of protecting navigation and minimizing adverse environmental impacts guide decision making.

A complex framework of regulations, laws and Executive Orders applies to dredging and dredged material disposal. These are

listed in Appendix 6. For the purpose of discussion, assume that a need for maintaining a given harbor is established, and that the material to be dredged has been evaluated to the extent necessary to determine physical, chemical and biological implications of disposal. This evaluation is conducted in accordance with guidance developed jointly by the Environmental Protection Agency (EPA) and the Corps. Assume further that all possible disposal alternatives have been identified and evaluated, leaving a number of practicable alternatives ("practicable" meaning available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes - 40 CFR 230.3).

Concurrently with evaluating the material to be dredged, it is necessary to evaluate the feasible disposal options in terms of a range of considerations with the object of identifying the least cost, environmentally suitable alternative. This process includes application of several Federal laws, as follows:

a. For sites in ocean waters or disposal operations in the Territorial Sea, the Ocean Dumping Act (ODA) applies (33 USC 1401 et seq). Disposal in these waters must comply with environmental criteria, developed by the Environmental Protection Agency (EPA) in consultation with the Corps and other Federal agencies, relating to impacts of the proposed disposal. The criteria are designed to ensure compatibility with requirements of the London Dumping Convention, to which the U.S. is signatory. These requirements are intended to

prevent pollution from ocean dumping via practicable safeguards. Army Corps evaluations of compliance with the criteria are subject to oversight by EPA.

b. For sites in inland waters and fill in the Territorial Sea, the Clean Water Act (CWA) applies (33 USC 1251 et seq). CWA incorporates Guidelines, also developed by EPA in conjunction with the Corps, to ensure that proposed discharges will not result in unacceptable adverse impacts to waters of the United States. The Corps is responsible for authorizing such discharges, pursuant to application of the Guidelines. EPA has environmental oversight and review. Section 401 of the CWA also requires state certification that a proposed discharge complies with applicable State water quality standards.

c. Dredging and disposal activities subject to the Coastal Zone Management Act (16 USC 1431 et seq) require state concurrence with a determination that the work as proposed is consistent with the Federally approved state coastal zone management program to the maximum extent practicable.

There are additional requirements intended to protect Endangered Species, Wetlands, Fish and Wildlife, Historic Resources, and other areas and resources of concern. In addition to specific coordination with appropriate agencies, the National Environmental Policy Act (NEPA) requires examination of all alternatives in an Environmental Assessment

or, if necessary, an Environmental Impact Statement (EIS); either document incorporates public comment.

B. RHODE ISLAND COASTAL RESOURCES MANAGEMENT COUNCIL

Based on the principle that unplanned or poorly planned development has restricted the most efficient and beneficial utilization of the state's coastal resources, the Rhode Island legislature declared that it is the policy of the state to preserve, protect, develop, and, where possible, restore the coastal resources through coordinated and comprehensive long range planning and management. It established the Coastal Resources Management Council ("Council") to carry this out.

The Council has categorized all coastal waters of the state into six divisions:

- Type 1 Waters - Conservation areas
- Type 2 Waters - Low Intensity Use areas
- Type 3 Waters - High-Intensity Boating areas
- Type 4 Waters - Multipurpose areas
- Type 5 Waters - Commercial and Recreational Harbor areas
- Type 6 Waters - Industrial Waterfronts and Commercial Navigation Channels.

For Type 6 Waters, including the Providence River shipping channel, the Council's goal is to encourage and support modernization and increased commercial activity related to shipping. The Policies for Type 6 Water give highest priority for (a) berthing, loading and unloading, and servicing of commercial vessels; (b) construction and maintenance of port

facilities, navigation channels, and berths; and (c) construction and maintenance of facilities required for the support of commercial shipping and fishing activities. The Council prohibits activities that substantially interfere with or detract from these priority uses.

The Council has defined dredging to be excavation of sediments from beneath tidal waters and coastal ponds for the purposes of navigation. The Council has divided it into two categories: (a) improvement dredging, which is dredging in previously undredged areas, and (b) maintenance dredging, where the purpose is to restore channels and basins to dimensions that support and maintain existing levels of use.

The Council's policies support necessary maintenance dredging activities in Type 2,3,4,5, and 6 waters, provided environmentally sound disposal locations and procedures are identified. They favor open-water disposal for large volumes of dredged materials, providing that environmental impacts are minimized. Other Council policies encourage innovative nearshore methods of dredged materials disposal, particularly when small volumes of material must be disposed. These options include the creation of wetlands, shellfish habitat, and beach nourishment in suitable areas.

In order to determine what type of dredged materials are involved in dredging activities and how they may impact water quality, the Council relies on the Department of Environmental

Management for dredged material classification, water quality certification and determination as to whether or not the materials pose environmental problems.

The Council has developed standards which complement and are driven by its policies. All dredged areas must be dredged in a manner which maximizes tidal flushing and does not undermine adjacent shoreline protection facilities and/or coastal features. For dredged materials disposal, open water options require that the materials be dumped solely within the confines of an approved open water site; be shown to remain within the disposal area and not be resuspended; be capped with a minimum of 6 inches of clean materials if polluted; be monitored for a period of at least one year and that the results of the monitoring be made public; and that material not be placed in prime fishing areas. Similar detailed environmental protection and management standards exist for disposal options such as wetlands, island or aquatic habitat creation, and beach nourishment.

The dredging and disposal of dredged materials for the Providence River project would be reviewed collectively. While restoring channel depths to its authorized and previously dredged depth of 40 feet is considered to be a maintenance project and would normally carry a Category A staff review, the disposal of dredged material would normally carry a Category B review, requiring full Council approval. Generally, though, dredging activities and disposal activities for the same project are reviewed as one.

For the federal portion of the project, a determination of consistency with the Rhode Island Coastal Resources Management Program will have to be submitted by the Army Corps to the Council. The Council will then either concur with the Army Corps determination as to whether the project is consistent with the Management Program, or not concur. Any decision made by the Council will be done after a review of the project is made under provisions of the Program as if it were a Category B application. However, this decision must be made within 45 days of receiving the Army Corps consistency determination. During this review period, the Council may hold a public hearing regarding the project and may request a 15 day extension to issuing its concurrence or non-concurrence. Integral to the Providence River project is the fact that the Army Corps will only dredge federal channels if nonfederal berth facilities undertake dredging consistent with the project. In this case, port facilities served by the Providence River shipping channel must assure the Army Corps that they will dredge their facilities to 40 feet. The volume, classification, and subsequent disposal location of the terminals' dredged materials will be taken into account within the CRMC review of Army Corps' federal consistency determination. The dredging activities of each terminal must still receive a Council Assent. Since dredging these berthing areas is a maintenance activity, a Category A staff review should prove sufficient. However, the Council will request a Water Quality Certification from DEM for these projects.

C. RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The Department of Environmental Management (DEM) is the state's water pollution control agency under the federal Clean Water Act. It is responsible for protection of the state's waters, which extend to three miles offshore. The department has promulgated the Rhode Island Water Quality Regulations for Water Pollution Control under RIGL 46-12 to implement the requirements of state and federal law. The purpose and goals of these regulations are:

"...to restore, preserve, and enhance the quality of the waters of the State and to protect the waters from pollutants so that the waters shall, where attainable, be fishable and swimmable, be available for all beneficial uses, and thus assure protection of the public health, welfare, and the environment."

These regulations establish water quality standards intended to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. The standards define the water quality goals of a water body by designating the use(s) of the water and by setting specific criteria necessary to protect the use(s).

All surface waters of the State have been assigned to a class which defines the uses of the water body. For sea water the classifications are as follows:

Class SA bathing and contact recreation; shellfish harvesting for direct human consumption; fish and wildlife habitat



Class SB shellfish harvesting for human consumption after depuration; bathing and other primary contact recreational activities; fish and wildlife habitat

Class SC boating and other secondary contact recreational activities; fish and wildlife habitat; industrial cooling; good aesthetic value

The regulations also specify physical, chemical, and biological criteria necessary to support the aforementioned water use classifications.

Regardless of classification, the following minimum criteria apply to all waters of the State:

"At a minimum, all waters shall be free of pollutants in concentrations or combinations that will:

- a) Adversely affect the composition of bottom aquatic life;
- b) Adversely affect the physical or chemical nature of the bottom;
- c) Interfere with the propagation of fish and shellfish; or,
- d) Undesirably alter the qualitative character of the biota.

"Aesthetics - all waters shall be free from pollutants in concentrations or combinations that:

- a) Settle to form objectionable deposits;
- b) Float as debris, scum or other matter to form nuisances;
- c) Produce objectionable odor, color, taste or turbidity; or,
- d) Result in the dominance of nuisance species."

There are also more specific and more stringent criteria established for individual classes of water.

In order to preserve and enhance the quality of the waters of the state, the regulations provide strict water quality requirements for discharges. Specific prohibitions include:

- Discharges shall not violate water quality standards
- Discharges shall not further degrade low quality waters
- Discharges shall not degrade high quality waters
- No new discharges permitted in class A or SA waters

In addition, the regulations outline antidegradation provisions which prohibit activities which would threaten existing uses of the state's waters.

The regulations define "discharge" as the addition of any pollutants to the waters of the state or where it is likely to enter the waters of the state. The definition of pollutant includes dredged material.

The DEM's Division of Water Resources reviews federal dredging projects under its water quality certification program. This process was established under the federal Clean Water Act and provides the state with the opportunity to review projects requiring federal license or permits which may result in a discharge to the state's waters. The certification is required for federal permits and licenses (Army Corps of Engineers) and is also required for most Coastal Resources Management Council assents. The certification review process determines whether a proposed project will be in compliance with the state's water quality regulations.

As part of the certification review for dredging projects, a disposal location must be identified. A Water Quality Certification is required for all in-water disposal options. The Division of Waste Management is currently working to formalize its review of upland disposal through amendments to its solid waste regulations. Under the proposed regulations, depending on the quality and quantity of material to be disposed, the Division of Waste Management might exercise jurisdiction over the dredged material as solid waste since upland disposal poses some specific additional risks such as direct human exposure and possible contamination of groundwater resources by salt or industrial contaminants. The variance procedures contained within the solid waste regulations provide a means of reviewing and approving any specific scheme for upland disposal of dredged materials even at unlicensed sites. The chart below summarizes the regulatory considerations for three different disposal options.

TABLE 3: Department of Environmental Management's Regulatory Framework for Dredged Material Disposal

| <p>UPLAND DISPOSAL<br/>(greater than 200' from a coastal feature)</p>  | <p>NEAR SHORE (UPLAND) DISPOSAL<br/>(within 200' (shoreward) of a coastal feature)</p>  | <p>IN WATER DISPOSAL<br/>(within State waters)<br/>3 miles</p>  |
|--|---|---|
| <p>Regulated by the Division of Waste Management (DWM)</p> <p>Must satisfy Solid Waste disposal requirements (variance provisions are included).</p> <p>Impacts to groundwater and surface water must be considered.</p> | <p><i>Water Resources</i><br/>Regulated by DWR</p> <p>Type* IA material may be used as beach nourishment.</p> <p>Type I, II, &amp; III may be disposed near shore provided adequate cover material is applied.</p> <p><i>Division of Waste Management</i><br/>DWM regulations may apply depending on the quantity and quality of the material.</p> <p>In all cases, a WQC from DWR is required.</p> | <p><i>Water Resources</i><br/>Regulated by DWR</p> <p>Class A: not allowed, no new discharge of pollutants</p> <p>Class B: allowed, provided disposal is not in violation of Water Quality standards</p> <p>Class C: allowed, provided disposal is not in violation of Water Quality standards</p> <p>In all cases, a WQC from DWR is required.</p> |

\* Type refers to the degree of contamination. *water quality certificate*

DWM - Division of Waste Management  
 DWR - Division of Water Resources  
 WQC - Water Quality Certificate

#### D. OVERLAP BETWEEN REGULATORY AUTHORITIES

Conflicting state regulations may pose a barrier to effectively implementing dredging. For example, CRMC regulations discourage the disposal of dredged materials in waters other than those classified as Type 4, 5, and 6. DEM regulations discourage disposal in other than Class SC waters. In fact, the areas where neither regulatory program discourages dredged material disposal are quite limited.

#### VI. SELECTION OF MANAGEMENT ALTERNATIVES

The lack of agreement on dredged material disposal has prevented all substantial dredging in Rhode Island for twenty years. No disposal location for this material is perfect; each has environmental, social, and economic impacts. Contaminated material, by its very nature, poses some degree of environmental risk, even if it is left in place. Every disposal location will have its opponents as well as proponents. However, dredging is vital to the preservation of shipping in Narragansett Bay and a dredged material disposal location(s) must be identified.

Both the state and the federal government have roles and decision authorities in actions involving the disposal of dredged material. The Army Corps' requirement is to identify ~~the dredged material placement~~ alternative which complies with

federal environmental laws and regulations in the least costly manner consistent with sound engineering practices. This alternative is used as the point of reference for Army Corps negotiations with state agencies and public organizations. State regulatory agencies are responsible for upholding requirements of state regulations which may mandate more stringent requirements.

In order to minimize contention regarding dredged materials management, the Taskforce has established the following process for the selection of management alternatives.

1. Gathering of Information. A Technical Advisory Committee (TAC) comprised of state and federal resource agencies and other appropriate knowledgeable sources shall map existing resources, uses, and values and shall compile evaluation principles to be used in the selection of dredged material disposal sites. The TAC will also identify what additional information is needed to ensure that a thorough evaluation of disposal alternatives is completed.

2. Nomination of Alternatives. The Army Corps, in conjunction with the TAC and with public input, shall develop a list of disposal alternatives based on the size of area(s) needed and general information associated with each generic alternative.

3. Screening of alternatives. The Army Corps, in conjunction with the TAC, shall review the nominated alternatives and, if necessary, conduct a preliminary screening to reduce the alternatives to a reasonable number for further investigation. To facilitate further investigation, similar proposals may be grouped together.

4. Pollutant evaluation. Simultaneous to the above tasks, the Army Corps and others with related dredging projects shall conduct sampling and testing of the areas requiring dredging. This will provide information on the quality and quantity of material needed to identify management options and evaluate the economic and environmental costs associated with alternatives. It may be necessary to perform additional sampling and analysis depending on the disposal option under consideration.

5. Draft NEPA Document. The Army Corps shall conduct an environmental assessment which evaluates the alternatives screened above and includes federal as well as required and appropriate non-federal dredging. The assessment shall recommend one or more disposal sites and appropriate management practices.

6. Public and Intergovernment Review. The Army Corps and the state shall conduct a public and intergovernment review of the environmental assessment. The comments of all federal agencies, including the U.S. Fish and Wildlife

Service, the National Marine Fisheries Service, the EPA, and others, shall be available for public review. Public comment will also be invited.

7. Finalized NEPA Document. Based on public and intergovernmental review, the Army Corps shall revise and finalize the document in accordance with the NEPA process. Final management practices shall be selected by the Army Corps in accordance with the requirement to identify the least costly environmentally acceptable alternative which complies with federal environmental laws and regulations.

8. Approvals. The Army Corps shall apply to the DEM for Water Quality Certification and to the CRMC for consistency concurrence. The approval process may also include public hearing requirements. Non-federal participants will require state and federal permits.

#### VII. PROJECT PLAN FOR IMPLEMENTATION OF DREDGING

The Taskforce has found that the Providence River shipping channel and related berths have shoaled substantially during the last twenty years. Nothing has happened to arrest this process. Thus conditions in the channel are likely to get worse as time passes unless dredging is undertaken. The Taskforce has also found that shipping remains economically important to Rhode Island and that further deterioration of the



channel would have adverse economic consequences for the state and its people. Further, the Taskforce has found that there are regulatory hurdles and requirements that must be addressed if dredging is to occur. The purpose of this plan is to identify those requirements and to establish an orderly and coordinated effort to carry out the necessary dredging of the Providence River shipping channel.

A. FEDERAL/STATE PARTNERSHIP: PROJECT MANAGEMENT

In order for dredging to proceed expeditiously, it is essential for the State of Rhode Island and the federal government to work in close cooperation to carry out the project.

For the State of Rhode Island, Governor Sundlun has, consistent with statutory authority, designated the Rhode Island Port Authority as the state's lead agency to carry out the coordination necessary for the dredging project. For the federal government, the Army Corps of Engineers has been assigned responsibility for dredging projects authorized by Congress.

In order to ensure that state and federal activities related to this project are well coordinated, the Interagency Taskforce to Preserve Shipping in Narragansett Bay will continue to meet throughout the project. Though the Taskforce chairman can call meetings at any time, it is anticipated that meetings will occur at all critical junctures noted in the timeline below.

The Taskforce recommends the establishment of an additional oversight body to assist in the development of dredged material management options. Specifically, a Technical Advisory Committee should be established and appointed by the Taskforce as soon as possible. This Advisory Committee would assist the state and the Army Corps as set forth in this report. This group should consist of knowledgeable representatives of state and federal resource agencies, members of the local research community, and members of the public with knowledge appropriate to the task.

#### B. COORDINATION WITH PRIVATE DREDGING

While dredging of the Providence River shipping channel is vital to marine commerce, it will do little good unless marine terminals are similarly dredged. The Army Corps has a standing agreement with the cities of Providence and East Providence and the state of Rhode Island that they will provide and maintain berthing area depths commensurate with the channel depth. (See Appendix 7.) In addition, private facility owners have expressed strong interest in conducting related dredging simultaneous to the channel project.

The Army Corps will incorporate these proposed non-federal projects within the scope of the environmental assessment and NEPA documentation for the channel project. However, it will be incumbent upon the non-federal project proponents to provide their own sampling and testing. Non-federal projects will also require separate state and federal permits.

As a first step in coordinating this activity, the Taskforce recommends that non-federal project proponents be contacted as quickly as possible. In order to meet the timetable recommended in this report, non-federal parties will need to complete their sampling and testing work by late August, 1993.

While every effort will be made to accommodate all non-federal projects, there may be a temptation for numerous unrelated private proposals to come forward as part of this project. If this is the case, then the Army Corps, with advice from the Interagency Taskforce, may need to consider limiting the project scope. The goal of this project is to preserve commercial shipping in the Providence River shipping channel. Unrelated projects will be accommodated only if they do not jeopardize this goal.

#### C. TIMETABLE/CRITICAL PATH OF ACTIVITIES

The projected timeline is an aggressive one. However, the Taskforce determined that it was preferable to lay out an optimistic schedule in order that problems could be identified as early as possible. The timetable is based on a number of assumptions:

1. Adequate funding will be available for all phases of the project;

2. Practicable dredged material disposal alternatives are available and sufficient information is available or attainable to allow evaluation of their feasibility;
3. Sufficient information is available to allow evaluation of impacts from dredging and disposal operations;
4. The state and federal government continue to maintain an interactive partnership in support of the dredging project;
5. Temporal restrictions on the performance of work, if any, will be limited to those clearly necessary to protect critical resources; and
6. A limited number of potential disposal sites will require detailed investigation, design, and construction.

DEADLINE

ACTIVITY

July, 1993

Establish Technical Advisory Committee (TAC) comprising appropriate state, federal, and private interests. TAC will work with the Army Corps and the state to gather appropriate information for an environmental assessment and regulatory approvals. The TAC will seek public suggestions on possible dredged material

disposal alternatives.

The state and the Army Corps will meet with interested non-federal dredging project proponents to explain the project and the permit information needed from them in order to conduct dredging.

August 31

The Army Corps and non-federal interests will complete their sampling and testing of the material to be removed from the shipping channel and related facilities. This will provide information needed to determine the size and type of disposal site(s) necessary.

Sept. 30

The Army Corps, in consultation with the TAC, will complete the initial screening of disposal alternatives. This will be presented to the Interagency Taskforce. A public presentation will also be held in order to explain the project and seek additional alternatives from the public.

Jan 1, 1994

The Army Corps, in consultation with the TAC, will complete its site evaluation report. This will be presented to the public. The NEPA process will begin.

- April 1, 1994 The Army Corps will provide an internal draft of the NEPA document to the Interagency Taskforce for preliminary review and comment.
- May 1, 1994 The Army Corps will publish the draft NEPA document. This document will contain the proposed management solution for dredged material. The Army Corps and non-federal dredging interests will apply for approvals.
- May 15, 1994 A public meeting will be held explaining the NEPA document. The goal is a joint meeting sponsored by the Army Corps, the CRMC, and the DEM. Thus, the interested public will be able to address all relevant agencies simultaneously.
- June 15, 1994 Public comment on the draft NEPA document is due.
- July 15, 1994 After review of public comments, the NEPA document is revised, completed, and signed by the Division Engineer of the Army Corps.
- Aug. 15, 1994 The Army Corps begins the bidding process. This includes an advance notice to bidders, an invitation to bid, opening of bids, and the awarding of a contract. At this time, non-federal projects can proceed to make

arrangements with dredging contractors, provided that state and federal approvals are in place.

Jan., 1995      Coordinated dredging begins.

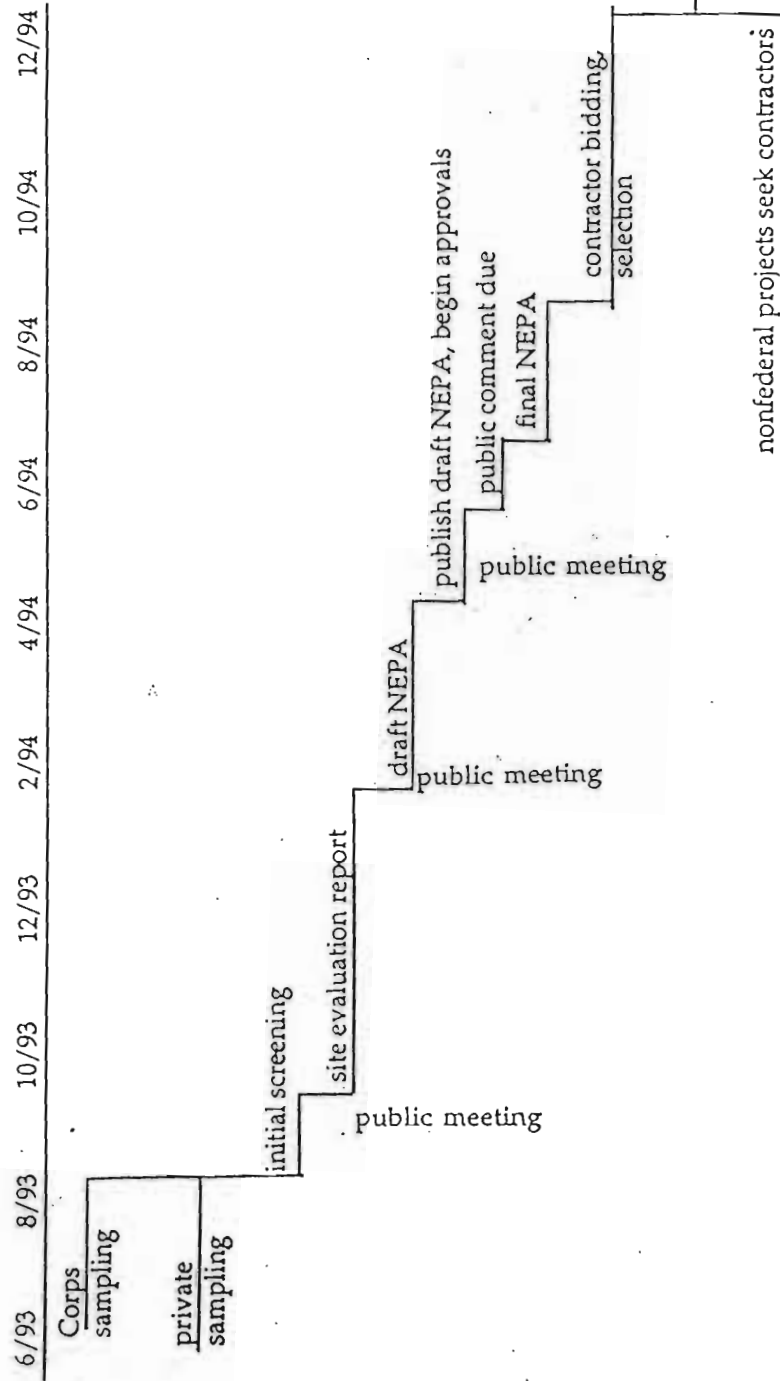
#### D. FUNDING

The entire cost of ordinary maintenance of the Narragansett Bay shipping channel is borne by the federal government through annual appropriations for Rivers and Harbors. The Harbor Maintenance Trust Fund, funded by a surtax charged on the value of commercial cargo loaded and unloaded at ports subject to the charge reimburses the Treasury for applicable costs. Access to these funds is controlled by the federal budget process. However, the Army Corps expenditures are limited to the least cost environmentally acceptable dredging and disposal alternative. Other funding sources would be needed for any additional costs or selection of a more costly alternative.

Non-federal project participants must fund their own dredging. City and state government should be made aware of their liability for mandated related dredging. In addition, there is the possibility that additional state funds will be required to gather information necessary in the site selection process.

The Army Corps has assured that the Providence River will receive full consideration for reprogramming of funds in FY 1994 and beyond for appropriations requests which would be

# DREDGING TIMELINE





sufficient to carry out the evaluation, permitting, engineering and construction phases of the project. The assistance of Rhode Island's congressional delegation in ensuring that these funds are allocated will prove invaluable.

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"Report of the Economic Impact Subcommittee on Port Unification, U.S. Small Business Administration, International Trade Task Force," Thomas F. O'Connor, Jr., Chairman, January, 1992.

APPENDICES

1. Executive Order 93-4
2. Minutes of the Interagency Taskforce
3. Economic Benefits of Port Facilities
4. Estimates of the cost of lightering
5. Estimates of dredged material quality
6. Federal laws, regulations, and executive orders pertaining to dredging
7. Providence River and Harbor Local Assurance Agreements

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NOTE: In an effort to save paper, the appendices have not been included in this copy of the report. Copies of the complete report with appendices are available in the Statehouse library and from the Governor's Policy Office.

## APPENDIX B

### OUTRAGE FACTORS

**VOLUNTARY OR INVOLUNTARY.** Risks that are voluntary are usually perceived by the public as less serious, i.e., less dangerous, than those that seem to be involuntary or imposed. When people feel that a risk is being imposed on them, they perceive it as outrageous and they attribute to it a higher level of risk—regardless of the actual hazard. A voluntary risk (such as smoking or driving without buckling the seatbelt) should never be compared with a perceived involuntary risk (such as drinking contaminated water). To make such a comparison would greatly heighten citizen outrage.

**CONTROLLED BY THE SYSTEM OR THE INDIVIDUAL.** People tend to view risks that they cannot control as more threatening than those that they can control, regardless of the actual hazard. Water contamination and concentrations of toxic pollutants (whether regulations deem them allowable or not) are perceived to be beyond the control of the individual. In the area of drinking water, in particular, outrage will increase if the public feels that utilities or local government agencies have all the control over the perceived risk.

**TRUSTWORTHY OR UNTRUSTWORTHY SOURCES.** How individuals view a risk is often a function of how much they trust the organization that seems to be imposing or allowing the risk and of how credible they believe the source of risk information is.

**MORALLY RELEVANT OR MORALLY NEUTRAL.** Risks that are ethically objectionable will be perceived as more dangerous than those that are not. Many people feel that pollution is morally wrong, and this makes talk of cost-risk tradeoffs sound callous. This feeling contributes to the public's desire to reach a zero-risk level.

**EXOTIC OR FAMILIAR.** Exotic risks appear more risky than familiar risks. For example, household cleaners seem less risky than the chemical plant that makes them. Toxic pollutants, with their long names, can certainly seem exotic.

**DREADED OR NOT DREADED.** Risks that are dreaded seem more serious than those that carry less dread. For example, toxic chemicals that are carcinogens may seem more risky and less acceptable than those that cause emphysema, even though both are capable of causing disease that can be fatal.

**CERTAINTY OR UNCERTAINTY.** Risks that are thought to be more certain or known are often perceived by the public to be less serious (and more acceptable) than those that are not. Conversely, risks that scientists are uncertain about are considered far more serious. In these cases, the public tends to want to err on the side of caution—that is, it does not want to accept risks that are uncertain (Santos 1990 p. 47-48).

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