Bill as Introduced

SB 70 – AS AMENDED BY THE SENATE

04/10/03 1225s

2003 SESSION

03-0475
06/10

SENATE BILL ***70***

AN ACT establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.

SPONSORS: Sen. Green, Dist 6; Sen. Prescott, Dist 23; Rep. Keans, Straf 67; Rep. Newton, Straf 67

COMMITTEE: Environment

AMENDED ANALYSIS

This bill establishes a commission to study certain recommendations of the New Hampshire estuaries project management plan and other issues related to the Great Bay estuary.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

SB 70 – AS AMENDED BY THE SENATE

04/10/03 1225s

03-0475
06/10

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Three

AN ACT establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Commission Established.

I. There is established a commission to study:

(a) The feasibility of implementing a recommendation of the estuaries project management plan that the discharge from area wastewater treatment plants be combined for discharge further offshore.

(b) Ways to aid in achieving restoration of the estuary habitat in a manner that is compatible with the National Estuary Restoration Act of 2000.

(c) Creation of a watershed district in the Great Bay Estuary area and the rivers that flow into it.

(d) Funding strategies for creating and maintaining effective partnerships between the federal government, the state government, local community governments and the private sector to fund and assist in the Great Bay estuary habitat restoration project.

(e) The need for joint public wastewater facilities for collection and discharge of treated wastewater and ways to achieve the construction, maintenance and management of these facilities.

II. Participation in this commission shall be voluntary.

2 Membership and Compensation.

I. The members of the commission shall be as follows:

(a) One member of the senate, appointed by the president of the senate.

(b) One member of the house of representatives, appointed by the speaker of the house.

(c) One member, appointed by the governor.

(d) One member from each participating town or city along the Great Bay estuary, river basin, and the estuarine watersheds, appointed by the governing body of the town or city.

(e) One member of the Strafford Regional Planning Commission, appointed by the commission.

(f) One member of the Rockingham Regional Planning Commission, appointed by the commission.

(g) One Strafford County commissioner, appointed by the county commission.

(h) One Rockingham County commissioner, appointed by the county commission.

(i) The commissioner of the department of environmental services, or designee.

(j) The reserve manager of the Great Bay National Estuarine Research Reserve.

(k) The director of the office of state planning, or designee.

II. Legislative members of the commission shall receive mileage at the legislative rate when attending to the duties of the commission.

3 Duties. The commission shall study:

I. The feasibility of implementing a recommendation of the estuaries project management plan that the discharge from area wastewater treatment plants be combined for discharge further offshore.

II. Ways to aid in achieving restoration of the estuary habitat in a manner that is compatible with the National Estuary Restoration Act of 2000.

III. Creation of a watershed district in the Great Bay Estuary area and the rivers that flow into it.

IV. Funding strategies for creating and maintaining effective partnerships between the federal government, the state government, local community governments, and the private sector to fund and assist in the Great Bay estuary habitat restoration project.

V. The need for joint public wastewater facilities for collection and discharge of treated wastewater and ways to achieve the construction, maintenance, and management of these facilities.

VI. The merits of forming a watershed district among area towns to provide for the collection, conveyance, and disposal of treated wastewater into the deep waters of the Piscataqua River or the Atlantic Ocean and for other water-related purposes and an appropriate name for any districts recommended.

VII. Funding strategies that a watershed district might use in conjunction with the state and federal governments for the benefit of the Great Bay Estuary and its environment.

4 Notice of First Meeting; Chairperson; Quorum. The senate member shall create a list of commission members and shall call the first meeting of the commission. The members of the study commission shall elect a chairperson from among the members. The first meeting of the commission shall be held within 45 days of the effective date of this act. Eight members of the commission shall constitute a quorum.

5 Report. The commission shall report its findings and any recommendations for proposed legislation to the senate president, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2003.

6 Effective Date. This act shall take effect upon its passage.

LBAO
03-0475
2/14/03

SB 70 FISCAL NOTE

AN ACT creating the Great Bay Estuary district and making an appropriation therefor.

FISCAL IMPACT:

The Department of Environmental Services has determined this bill will increase state, county and local revenue and expenditures by an indeterminable amount in FY 2004 and each year thereafter.

This bill authorizes in FY 2004, $1,000,000 in bonds to be paid for by a special fund consisting of assessments on user municipalities.

METHODOLOGY:

The Department of Environmental Services has stated this bill establishes the Great Bay Estuary District located within the Department of Environmental Services for the construction, operation and maintenance of interceptor sewer lines and an outfall delivery pipeline to be used for the disposal of wastewater for the municipal sewage treatment plants in the Great Bay Estuary area. With the exception of the $1,000,000 bond authorized for the preliminary design, layout and final design for the project, it is not possible to determine any revenue or expenditures for state, county or local governments for the following reasons:

- The actual number of community or county members of the Great Bay Estuary District is unknown;
- No district boundaries have been determined so the amount of interceptor sewer is unknown;
- The total scope of the project is unknown. Including length and size of interceptor sewers, number and size of pump stations (if any) that are required, whether treatment beyond secondary will be required and the length and size of the outfall;
- The district as it is proposed is not eligible for low interest loans or state aid grants;
- If the district is established as part of the Department of Environmental Services, it is unknown how much of an increase in staff will be required to oversee construction and the operation and the maintenance of the facilities;
- This bill establishes two new funds: one for assessments on municipalities to pay for the bond authorized in the bill and the other to provide capital for repair and replacement of

major components of the facilities. The replacement fund is capitalized by contributions from members served by the facilities; and

- The $1,000,000 appropriated in this bill is likely insufficient to conduct a preliminary design, layout and final design, but an appropriate amount cannot be determined.

Amendments

Rep. Royce, Ches. 28
May 8, 2003
2003-1544h
06/01

Amendment to SB 70

Amend paragraph I of section 2 of the bill by inserting after subparagraph (k) the following new subparagraph:

(l) The executive director of the fish and game department, or designee.

Speakers

SIGN UP SHEET

To Register Opinion If Not Speaking

Bill # SB 70 Date May 7, 2003

Committee Resources, Recreation + Development

** Please Print All Information **

Name	Address	Phone	Representing	(check one) Pro	Con
John Bush		271-2001	NH DES	X	
Judy Silva	PO Box 617 Concord	224-7447	NHMA	X	
Marjory Bunge	CMCRD	224-7867	NH Association of Conservation Commissions	X	

Hearing Minutes

HOUSE COMMITTEE ON RESOURCES, RECREATION AND DEVELOPMENT

PUBLIC HEARING ON SB 70

BILL TITLE: (New Title) establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.

DATE: May 7, 2003

LOB ROOM: 305 **Time Public Hearing Called to Order:** 10:00 A.M.

Time Adjourned: 11:13 A.M.

(please circle if present)

Committee Members: Reps. Royce, Lawton, R. Cooney, D. Fields, Russell, Bruno, D. Christensen, Akins, Camm, Ruffner, Cail, Campbell, C. LaFlamme, Merrow, Wiley, Spang, McEachern, Bleyler, Brueggemann, Donovan and Parkhurst.

Bill Sponsors: Sen. Green, Dist 6; Sen. Prescott, Dist 23; Rep. Keans, Straf 67; Rep. Newton, Straf 67

TESTIMONY

* Use asterisk if written testimony and/or amendments are submitted.

Senator Richard Green - Prime sponsor of the bill. Senate passed bill unanimously. Many of seacoast rivers flow into estuaries. Permitting becoming much more stringent. Bill sets up a voluntary commission. Mostly concerned with metals in the waste stream. Many seacoast communities have no facility to handle septage. Asking for $1M "seed money" so federal grants can be applied for.

*** Chairman Royce reads letter from Fish and Game.**

William Hounsell, Rochester City Manager - Supports the bill.

Chairman Royce: Do communities have a choice whether to participate in the program? ANS: Absolutely. There are 43 towns in this watershed, and we probably not get them all.

Rep. Bleyler: Does this not need federal involvement because every thing flows into the Piscataqua River? ANS: Yes.

Rep. Spang: Are there other towns besides Durham who have been affected by the need of dredging the Lamprey River? ANS: Yes, but I'm not ready to commit any of them.

*** John Bush, NH Department of Environmental Services (DES)** - Supports the bill. Says DES involvement is vital to the success of this commission. Bill solves many town's problems with disposing of septage. Ultimately will involve a pipeline for treated waste.

Rep. Christensen: Are there alternatives to "ocean dumping"? ANS: There are people on the commission with expertise in recycling efforts.

*** David Hartman, NH Office of State Planning** - Supports the bill. There is direct involvement with the EPA's shell fish restoration project.

Rep. Campbell: Is there a cut-off date for towns "signing up" for the program? ANS: Yes, November 1, 2003.

Kenneth N. Ortmann, Planning Director, Rochester - Supports the bill. States that their treatment plant discharges treated waste into the Cocheco River is extra clean.

*** Cliff Cinnott, Rockingham & Strafford Regional Planning Commission** - Supports the bill. Town of Hampton has a problem with compliance with disposition of treated waste. This bill will help them.

Rep. Spang: Isn't November 1, 2003 a little too short a time for the study? ANS: This date can be extended legislatively if necessary.

Rep. Sandra Keans - Submitted a pink card but did not testify.

Rep. Spang: Is the fiscal note now changed? ANS: Yes, because we now know of further federal grant money.

Respectfully submitted,

David H. Russell

Rep. David H. Russell
Clerk

Testimony

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-3503 FAX (603) 271-2982

May 7, 2003

The Honorable H. Charles Royce, Chairman
Resources, Recreation, and Development Committee
Room 305, Legislative Office Building
Concord, NH 03301

Re: **SB 70, establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan**

Dear Chairman Royce:

Thank you for the opportunity to comment on SB 70, which establishes a commission to study implementing a recommendation of the New Hampshire estuaries project management plan. One of the recommendations of the management plan will call for the establishment of some form of watershed district for sewage treatment. This district would be for the construction and maintenance of interceptor sewer lines and an outfall delivery pipeline to be used for the disposal of wastewater from the municipal sewage treatment plants in the Great Bay Estuary area.

The Department of Environmental Services (DES) supports the need to further evaluate the potential cost effectiveness of a major treated-sewage interceptor system and ocean outfall to address the wastewater disposal needs of the Great Bay/Piscataqua River watershed. Should this particular regional system be determined to be a cost effective sewage disposal solution, the commission would determine what type of district should be created in order to achieve the best management approach.

In January 2002, the Strafford Regional and Rockingham Planning Commissions along with several municipalities recognized the potential benefits that a regional outfall system could provide to the coastal communities. With funding from the New Hampshire Coastal Program, the Towns of Exeter and Newmarket, and in-kind services from the Strafford Regional and Rockingham Planning Commissions, preliminary planning activities were initiated in August 2002 to:

- Increase municipal understanding and support for a critical examination of the concept of a regional outfall system;
- Develop a strategy for project funding;
- Provide public education in coastal zone communities for wastewater treatment issues; and

- Prepare a scope of work (SOW) for a detailed facilities plan to address all significant issues, including technical, environmental and financial related to the project.

This work is expected to be completed by June 2003. The second planning phase, using the SOW developed during the first phase, is expected to be the preparation of a detailed facilities plan at an estimated cost of between $350,000 and $600,000. Actual facility plan costs will be dependent on a number of considerations including the methodology, data collection needs, and modeling requirements. More accurate costs for the facilities plan will be available when the first phase is complete and the policy, financial, technical and environmental issues have been more clearly identified.

Thank you again for this opportunity to comment. Please call me at 271-3503 or John Bush at 271-2001 if you have any questions or need additional information.

Sincerely yours,

Robert Monaco
Acting Commissioner

cc: Senator Green
Senator Prescott
Representative Keans
Representative Newton

New Hampshire
Fish and Game Department

2 Hazen Drive, Concord, NH 03301-6500
Headquarters: (603) 271-3421
Web site: www.wildlife.state.nh.us

TDD Access: Relay NH 1-800-735-2964
FAX (603) 271-1438
E-mail: info@wildlife.state.nh.us

William S. Bartlett, Jr.
Acting Executive
Director

Daniel R. Lynch
Assistant Director

May 7, 2003

H. Charles Royce, Chairman
House Resources, Recreation and Development Committee
Room 305 LOB
Concord, NH 03301

Dear Representative Royce,

We are unable to attend the hearing this morning on SB 70 relative to establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan. In reviewing the language of this bill the Department would like to offer a couple of comments.

We feel it may not be necessary to include in the study ways to aid in achieving restoration or acquisition of estuary habitat as the process and procedures for this are well defined through existing mechanisms. The study should focus on the issues of wastewater treatment.

We would also suggest that the membership listed in I. (j) of section 2 of the bill be amended to read: "(j) The executive director of the fish and game department, or designee" instead of specifically referencing the reserve manager of the Great Bay National Estuarine Research Reserve. Thank you for this opportunity to comment on SB 70.

Sincerely,

Sandra Falicon
Legislative/Rules Coordinator

Conserving New Hampshire's wildlife and their habitats since 1865.

Strafford Regional Planning Commission &
Rockingham Planning Commission

May 6, 2003

Rep. H. Charles Royce, Chair
Resources, Recreation and Development Committee
Room 305; Legislative Office Building
Concord, NH 03301

RE: Senate Bill 70 – Commission to Study Implementing NH Estuaries Management Plan Recommendation (regional wastewater outfall)

Dear Representative Royce and Members of the Committee,

We are writing to express the support of Strafford Regional Planning Commission and Rockingham Planning Commission for Senate Bill 70, which would establish a study committee for the purpose of investigating the combined discharge of treated wastewater from communities within the coastal drainage basin to offshore or deep-water locations. We agree that a need exists to study this potential long-term solution to regional wastewater discharge.

Both our agencies were concerned about an earlier version of this bill, as it appeared to authorize creation of a regional wastewater authority and bonding authority without additional study. The study committee proposed by the amended bill appears to be the appropriate mechanism to begin an in-depth evaluation of the need, benefits, costs, and methods for such an approach and to help to define the best course of action for the region.

As you may know, the SRPC and RPC are presently working on an initial scoping study to investigate local and regional interest in a regional wastewater discharge solution. This study, lead by the SRPC, and funded through the NH Coastal Program and local communities, is intended to gather initial input from municipalities, state and federal agencies and local organizations about the specific issues and potential impacts that should be studied as part of a full feasibility study. We will be happy to provide the results of the Scoping Study to the study committee when completed.

We have two specific comments and suggestions regarding SB 70, as amended. First, that the study area be more clearly defined as the Piscataqua River Basin and Coastal drainage areas. Second, to eliminate from the SB 70 Commission's duties (Section 3 - Duties) the study of the feasibility of implementing the regional waterwater outfall recommendation. We feel that determining the feasibility and advisability of such an effort will require more indepth technical study than can be accomplished within the timeframe and resources provided for in the bill. We would suggest that a full technical feasibility study, including examination of benefits, costs and environmental impacts should take place following the SB 70 Commission findings regarding the other elements of study identified in this section.

We hope that you will consider this bill favorably. Please consider both Commissions to be at your disposal in assisting the review of this matter.

Sincerely,

CMS for

Cynthia Copeland, Executive DIrector
Strafford Regional Planning Commission

Cliff Sinnott, Executive Director
Rockingham Planning Commission

cc: SRPC & RPC Executive Committee

OFFICE OF STATE PLANNING
STATE OF NEW HAMPSHIRE
2½ BEACON STREET - CONCORD 03301-4497
TELEPHONE: 603-271-2155
FAX: 603-271-1728

May 7, 2003

Hon. H. Charles Royce, Chair
House Resources, Recreation and Development Committee
Legislative Office Building, Room 305
Concord, NH 03301

Subject: SB 70 establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.

Dear Chairman Royce:

The Office of State Planning takes this opportunity to comment on SB 70

Both the Office of State Planning's Coastal Program and Estuaries Project are supportive of efforts to identify solutions that help reduce contaminants entering the waters of the Great Bay Estuary. The Estuaries Project is focused on water quality issues of our tidal waters including potential for upgrading sewer facilities in the watershed. The Coastal Program in currently funding a project with the Strafford Regional Planning Commission to develop a scope of services to study the feasibility of building a regional sewage disposal system along the lines that are included in the amended SB 70. Work on this task was late in getting started, and is scheduled to be complete in June 2003. Due to lateness in getting underway, the project will probably be delayed in completion. The resulting scope of services would then be used to solicit consultant to do an in-depth analysis of the options for a regional wastewater disposal system. Hopefully, this product could be used directly in carrying out the work of the Commission created under this bill.

For several years, there has been interest among coastal community leaders in studying the feasibility of a regional sewage treatment system. The several municipal systems that exist might experience efficiencies in combining their functions, especially at final treatment and effluent disposal.

Specific comments are directed to the bill's language. The number of members designated under Section 2.I(c) may be more than the Committee would desire. There are 43 cities and towns in the general areas described in this section, constituting 43 members on the Commission. Also, under Section 5, if the Committee is intending that this Commission is going to undertake a major study of many options, then the due date of November 1, 2003 seems too soon.

Thank you for this opportunity to comment on this bill.

Sincerely,

David E. Hartman, Manager
NH Coastal Program

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By

INTERIM REPORT
CH 236:1, SB 70, Laws of 2003
Study implementing a recommendation of the New Hampshire estuaries project management plan.

TO: Governor Benson, Speaker Chandler, and Senate President Eaton

FROM: Senator Russell Prescott, Chairman

Commission Members:
Senator Russell Prescott
Representative Kurt Roessner
George Berlandi: Department of Environmental Services
Grace Botitta: Town of Exeter
Representative Pierre Bruno: Governor's Office Appointee
John Bush: Department of Environmental Services
Paul Colby: Town of Fremont
Cynthia Copeland: Strafford Regional Planning Commission
Bruce Dearborn: Town of Greenland
Stephen Fournier: Town of Northwood
Jeff Gardner: Town of Rye
Dianne Gilbert: Town of Epping
Representative Thomas Gillick: Town of Hampton
Wesley Golomb: Town of Deerfield
William Herman: Town of New Durham
Jennifer Hunter: Office of State Planning
Raymond Jones: Town of Brentwood
Shep Kroner: Town of North Hampton
Robert Levesque: Town of Durham
Russell McAllister: City of Rochester
Sharon Meeker: Town of Lee
Dean Peschel: City of Dover
Carol Reilly: Town of Barrington
Peter Rice: City of Portsmouth
Doug Scamman: Town of Stratham
Cliff Sinnott: Rockingham Planning Commission
John Skewes: Town of Kensington
Lawrence Smith: Town of East Kingston
David Sweeney: Town of Newington
Representative Janet Wall: Town of Madbury
Jonathon Wood: Town of Raymond

The New Hampshire estuaries project management plan study commission first met on August 14, 2003. Since that time the commission convened for three additional meetings on September 11th, September 30th, and October 23rd.

The commission was charged with the responsibility of conducting a feasibility study to look at the creation of a regional wastewater treatment plan for towns and cities in the Seacoast area. The Capital Budget for FY 2004-05 appropriated $1,000,000 to the Estuary Wastewater Project Study. With these goals and budgetary allowances in mind, the commission created a Request for Proposals (RFP). Throughout the drafting process commission members were encouraged to contribute information, provide commentary, and suggest change. Following weeks of work and several draft reports, the final version of the RFP was accepted by vote at the October 23rd meeting. (Attached please find the approved Request for Proposals)

The RFP will be mailed to 15 pre-qualified engineering firms. Consultants have 60 days to submit their proposals from the time that DES mailed the RFP.

The commission's next meeting is scheduled for January 12, 2004. In the interim, Senator Prescott will be forming a sub-committee of commission members to assume primary responsibility for the consultant selection process. Once the engineering firm has been selected and the feasibility study is underway, the full commission will meet on a bi-montly basis. All actions taken by the hired consulting firm are subject to the commission's approval.

Senator Prescott will also submit an LSR on behalf of the commission in case there is a need for legislative involvement.

Respectively Submitted,

Russell E. Prescott

Senator Russell Prescott, Chairman

Request For Proposals:
Feasibility Study For a Regional Outfall Sewer System

INTRODUCTION

The Department of Environmental Services (DES) requests proposals from qualified consulting engineering firms to provide professional planning and engineering assessment services to the Study Commission (COMMISSION) established by Senate Bill 70.

The project is to conduct a Feasibility Study (Study) to determine the feasibility of constructing a regional interceptor to collect the effluent from the municipal wastewater treatment plants located in the study area (see attachment) and discharge their effluent into the Atlantic Ocean. As part of the Study, the selected consultant (CONSULTANT) shall perform all tasks contained in the Scope of Work, including assessing present and future community wastewater treatment and septage needs, determining the feasibility of a regional outfall system and reviewing other alternatives to addressing the communities' wastewater and septage needs.

QUALIFICATIONS

1. The CONSULTANT shall provide any and all documentation of experience and ability to perform the Scope of Work. Prior experience with projects involving regionalization of wastewater treatment facilities and modeling of outfalls are necessary for qualification for this work.

2. The CONSULTANT shall have registration and good standing with the Secretary of State, Corporate Division, in order to perform work in the State of New Hampshire.

3. The CONSULTANT shall be listed on DES's Roster of Prequalified Consulting Engineers.

4. The CONSULTANT must demonstrate their ability through present staffing and sufficient assigned personnel to complete the project in the scheduled time as agreed by the Commission and the proposing consultant.

5. The CONSULTANT shall employ or contract with a professional who is a member of the American Institute of Certified Planners and a Professional Engineer who is registered in the State of New Hampshire.

SUBMITTAL

1. The CONSULTANT shall submit 25 Copies of the Proposal, by mail or in person (no faxes or e-mailed proposals will be accepted) to DES, 29 Hazen Drive, Concord, New Hampshire 03301, no later than close of business 60 days after the Request For Proposal was mailed from DES.

2. Proposals shall be 8 ½" x 11" with foldout inserts as appropriate.

3. Proposals shall include, at a minimum, all of the required tasks listed in the Scope of Work along with a timeline integrating the tasks with milestones.
4. Questions shall be submitted in writing (e-mail address is gberlandi@des.state.nh.us) to DES. Replies will be communicated to all consultants who receive a copy of this Request For Proposal from DES.

5. Costs incurred in the preparation of proposals in response to this Request for Proposal shall be the sole responsibility of the firm submitting the proposal.

SELECTION OF PROPOSAL

Proposals will be evaluated on their merits in accord with the requirements of RSA21-I: 22. Following a review of proposals submitted for this project, no more than five firms shall be selected for interviews and presentations. The key individuals identified in the proposal that would be assigned to the project must attend the interview.

As a result of the proposal review and interviews, the consultants shall be ranked, and the Department, on behalf of the Commission, will enter into negotiations with the highest-ranked firm for a consulting contract. Should agreement not be able to be reached with this firm, the Department will negotiate with other firms in the order of their ranking.

Please note that our selection of a consultant is subject to approval of the Governor and Executive Council of the State of New Hampshire.

EVALUATION CRITERIA

A rating matrix (100 points) has been developed and the following criteria will be used to evaluate and select the firms to be interviewed. Please note that CONSULTANTS that do not meet the qualifications listed on page 1 will not be considered for this project:

1. The quality and depth of the Consultant=s proposed individual and project team experience as indicated in resumes and as related to similar projects. (20 points)

2. Understanding of the project and work and how well the proposal describes, in detail, the major tasks necessary to accomplish the project=s objectives. (20 points)

3. Our impression of the firm=s approach, creativity and methodology for completing the project. (25 points)

4. The soundness of the project management plan presented for providing the necessary services and delivering the project. (10 points)

5. Reality of the proposed project schedule. (10 points)

6. Clarity and conciseness of proposal. (10 points)

7. All other relevant facts or matters mentioned in the Request for Detailed Proposal the Commission may consider in making its determination. (5 points)

Based on the information obtained from the matrix above, the COMMITTEE shall select and interview no more than 5 CONSULTANTS.

Thank you for your interest and consideration in responding.

Scope of Services

Feasibility Study For a Regional Outfall Sewer System

I. PROJECT BACKGROUND

There are forty-four communities located in the New Hampshire portion of the study area. Seventeen of these communities have municipal wastewater treatment plants (see attachment) that, for the most part, only treat wastewater generated from within their political boundaries. They also, to varying degrees, receive septage from the surrounding towns. These communities are responsible for ensuring that the effluent from their treatment plants meets state and federal regulations. In total, the communities have invested well over $50 million in capital costs and annual operating expenses ranging from $300,000 to $1.2 million per community.

Permit limits for wastewater treatment facilities have become more and more stringent. Further, with new forthcoming requirements for nutrients and sediment, the trend is likely to continue. Additionally, it is becoming more difficult for communities to dispose of their septage. The net effect of these problems is that communities will face significant increases in the capital and operating costs of their wastewater and/or septage treatment facilities.

To address this issue and to determine if there was a better alternative for these communities, other than continuing to address the wastewater/septage problems on their own, the State passed Senate Bill 70. Senate Bill 70 establishes a COMMISSION to study, among other things, the feasibility of collecting the effluent from municipal wastewater treatment plants and discharging the effluent into the Atlantic Ocean.

II. GENERAL REQUIREMENT

1. The CONSULTANT shall conduct a Feasibility Study (Study) to determine the feasibility of constructing a regional interceptor to collect the treated effluent from the municipal wastewater treatment facilities in the study area and the discharge of the effluent into the Atlantic Ocean. The Study shall be conducted under the direction of the COMMISSION.

2. The CONSULTANT shall provide all applicable information in the Scope of Work in a format that can be used to complete an environmental analysis or an Environmental Impact Statement.

3. The project's geographic area includes all of the municipalities shown in the attachment. However, the CONSULTANT shall identify and bring to the attention of the COMMISSION, any issues relative to the impact on other communities, whether located in New Hampshire or Maine and, if directed by the COMMISSION, include the additional municipalities in the study area.

4. A Professional Engineer registered in the State of New Hampshire shall prepare and stamp all engineering evaluations and reports.

5. Prior to performing any of the specified tasks outlined in this Scope of Work, the CONSULTANT shall prepare, for the COMMISSION'S approval, a public information program that, at a minimum, includes all meetings required by the Scope of Work and provides timely information to the COMMISSION and other interested parties. Items that need to be considered to be included in this program are websites, public information meetings, public hearings, press releases, newsletters, presentation graphics, support displays and handouts.

6. Prior to performing any of the specified tasks outlined in this Scope of Work, the CONSULTANT shall present, for the COMMISSION'S approval, all models and methodologies that they plan on using for this project.

7. The CONSULTANT shall hold bi-monthly meetings with the COMMISSION to present a status report on the progress of the project.

8. The CONSULTANT shall enter into a negotiated "standard state contract" (Agreement) with DES prior to initiating any work. The CONSULTANT shall begin performance of the services designated in the AGREEMENT promptly upon receipt from DES of a Notice to Proceed.

9. This AGREEMENT does not include the Final Design Stage (consisting of contract drawings, special provisions, specifications, and estimate of quantities and unit-cost items) or the Construction Stage, unless authorized and funded by a Supplemental Agreement.

10. The date of completion for the professional services rendered under this AGREEMENT shall be as agreed to by the COMMISSION and the selected CONSULTANT.

III. SPECIFIC TASKS TO BE PERFORMED

PHASE I - Information Meeting

The CONSULTANT shall prepare a Public Notice for publication in newspapers with local circulation in the study area and hold at least 2 public informational meetings in the study area. These meetings shall be held with appropriate local, regional, state and federal agencies, other interested groups, and the public to initiate the coordination process, discuss the project and identify any issues of concern. The CONSULTANT shall be responsible for preparing letters of invitation to all interested parties to these meetings, developing appropriate graphics, making technical presentations, and handling other tasks as necessary.

PHASE II - Data Collection/Coordination

1. Maps

The CONSULTANT shall prepare a base map, at a scale that clearly shows all pertinent items, such as the wastewater treatment facilities, pumping station locations, existing outfall locations, environmentally sensitive areas, septage sites, surface waters and ground water supplies, drinking water resources, and conservation areas. The base map shall be appropriately enhanced for display purposes at meetings to aid in presentations and the development of the reports described in the Scope of Work.

2. Report Review

The CONSULTANT shall use the *Planning Background Report, Toward Regional Treated Effluent Discharge Policies and Strategies for the Regional Master Plan*, prepared by the Strafford Regional Planning Commission, June 27, 2003, hereinafter referred to as the SRPC REPORT, as background information for the Study.

In addition, the CONSULTANT shall review pertinent references contained in the SRPC REPORT, including the *New Hampshire Estuaries Project- Management Plan, 2000 and A Technical Characterization of Estuarine and Coastal New Hampshire, NHEP, 2000* and incorporate into the Study, to the extent practicable, information relative to this project.

The CONSULTANT shall also review and incorporate, to the extent practical, work and studies developed by other consultants, universities, and local, regional, state and federal agencies relative to this project.

3. Data Collection

The CONSULTANT shall contact each municipality in the study area and, at a minimum, collect the following information:

a. Current Conditions

(1) Existing population, including seasonal trends;
(2) Current land uses;
(3) Description of existing wastewater treatment facilities including such things as, location, service areas, treatment methods, capacity, current wastewater flows and loadings, current septage flows, outfall locations, dilution levels, permit limits, compliance status, management authority, administration, operations, costs, construction/improvement date;
(4) Planned wastewater treatment facility expansions and improvements and associated costs;
(5) Existing surface or ground water quality or quantity problems;
(6) Local and regional issues relative to wastewater/septage treatment and disposal;

(7) Inventory of existing formal and/or informal septage disposal agreements or arrangements between municipalities and wastewater treatment facilities;
(8) Environmental impacts on aquatic life, etc. from the current discharge of treated effluent and/or septage disposal;
(9) Use and availability of surface water and groundwater; and
(10) Water supply sources, needs, and problems.

b. Future Conditions (Note: Any models and methodologies anticipated to be used by the CONSULTANT must be approved by the COMMISSION prior to proceeding.)

(1) Population, geographic distributions, and land use projections for at least a 20-year period;
(2) Wastewater flows for at least a 20-year period;
(3) Septage volumes for at least a 20 –year period;
(4) Future constraints of NPDES permit requirements and state surface water quality regulations;
(5) Future constraints at existing facilities with increase in design flow;
(6) Future environmental impacts on aquatic life, etc. from the discharge of treated effluent and/or septage disposal;
(7) Future constraints, demand and availability of groundwater; and
(8) Water supply sources, needs and problems.

4. Preliminary Findings Report

The CONSULTANT shall schedule and conduct an Informational Meeting with the COMMISSION and other interested parties. At this meeting, the CONSULTANT shall present a Preliminary Findings Report which, at a minimum, shall include a summary of the data collected to date, a discussion of their approach for modeling future populations, land use and flows, a discussion of the environmental impacts of the existing facilities on sensitive resources, such as surface and groundwater quality and quantity, and a list of the proposed alternatives that will be studied.

PHASE III - Alternatives Development and Screening

1. Alternative(s) Development

Based on all of the available information, the CONSULTANT shall formulate various treatment facility and routing alternatives taking into consideration: discussions with local communities; constructability issues; resource impacts; required right-of-way impacts; capital/construction costs and operation and maintenance costs.

At a minimum, the alternatives shall include:

a. Collecting the effluent from some or all of the existing municipal wastewater treatment facilities and discharging the treated effluent into the Atlantic Ocean;
b. Collecting the effluent from some or all of the existing municipal wastewater treatment facilities and discharging the effluent to land for either recharge to the groundwater (e.g. deep well injection) or for water reuse (e.g. irrigating golf courses);
c. A combination of a. and b. above;
d. Collecting of wastewater and treatment at a regional wastewater treatment facility; and
e. Not taking any action (communities continue to address their own wastewater needs individually).

2. Alternatives Analyses

The CONSULTANT shall fully analyze each alternative developed in the previous task and determine the preferred alternative. The Consultant shall, at a minimum consider the impact of each alternative on:

a. Surface and groundwater quality and quantity;
b. Surrounding land uses (e.g. odor problems...);
c. Environmentally sensitive areas such as wetlands, recreation, ocean research sites, and shellfish areas;
d. Regional growth and land use development;
e. Treatment facility administration / operations / costs;
f. User charges and property tax impact;
g. Economic conditions; and
h. Reliability.

For each alternative, capital construction costs shall be estimated as well as operation and maintenance costs. These costs shall be used to determine a life cycle cost effective comparison for all of the alternatives.

PHASE IV - Preferred Alternative Report

The CONSULTANT shall prepare a detailed description of the preferred alternative including:

a. Site Location
b. Area Needed
c. Land ownership/easement requirements.
d. System ownership.
e. Permits needed
f. Capacity
g. Design life
h. Proposed facility (ies)

The CONSULTANT shall describe options for operation and maintenance of the preferred alternative and define responsibilities of municipalities and/or other entities charged for the proposed facilities.

The CONSULTANT shall describe:

a. Cost of implementing the preferred alternative (including operating and maintenance costs);
b. Financial impact on each community and their user charges;
c. Methods of financing.

The CONSULTANT shall describe construction issues such as:

a. Phases
b. Time line
c. Description of how services will be continued until project is complete.

The CONSULTANT shall develop a preliminary engineering design for the preferred alternative, including plans and profiles. The preliminary design shall also address, at a minimum, the location, routes, road crossings or bridge issues, needed right-of-way, constructability issues, utilities, water-quality resources and proposed mitigation projects.

PHASE V - Final Report

1. Draft Study Report

The CONSULTANT shall prepare a DRAFT FEASIBILITY STUDY Report (Report) addressing all of the items and tasks required herein, including a list of the actions needed to implement the preferred alternative.

The CONSULTANT shall submit 25 copies of the draft Report for the COMMISSION's review and approval.

2. Draft Study Report Public Hearing

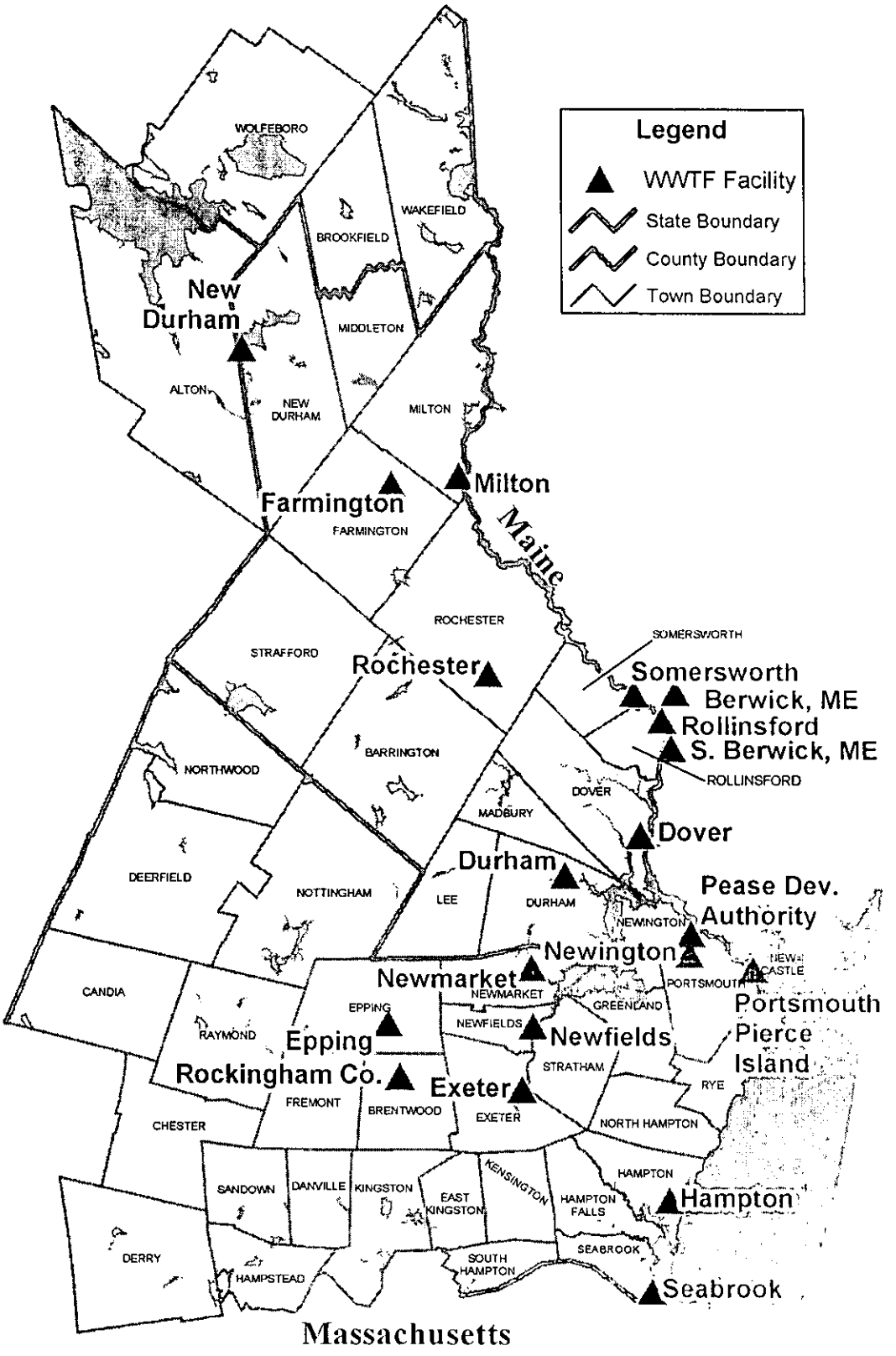
The CONSULTANT shall also schedule and conduct 2 public hearings in the study area to present their findings and receive comments on the draft Report. The CONSULTANT shall be responsible for preparing letters of invitation, developing appropriate graphics and handouts, as necessary, to aid in the presentation.

3. Draft Study Report Final Study Report

The CONSULTANT shall respond in writing to address all of the comments received and supply the COMMISSION with a copy of the comments and responses.

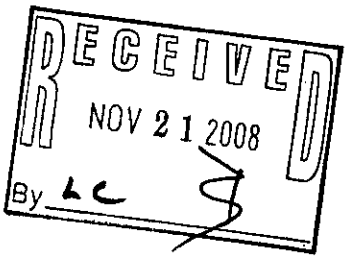
The CONSULTANT shall incorporate the COMMISSION's comments in the Feasibility Study Report and submit 3 copies of the final draft to DES for their review and approval. Upon DES's approval, the Consultant shall prepare 35 copies of the Report for distribution to the COMMISSION.

STUDY AREA


Legend
WWTF Facility
State Boundary
County Boundary
Town Boundary
WOLFEBORO
WAKEFIELD
BROOKFIELD
New Durham
MIDDLETON
ALTON
NEW DURHAM
MILTON
Milton
Farmington
FARMINGTON
Maine
ROCHESTER
SOMERSWORTH
STRAFFORD
Rochester
Somersworth
Berwick, ME
Rollinsford
S. Berwick, ME
ROLLINSFORD
BARRINGTON
NORTHWOOD
DOVER
MADBURY
Dover
Durham
DEERFIELD
NOTTINGHAM
LEE
DURHAM
Pease Dev. Authority
NEWINGTON
Newington
NEWCASTLE
Newmarket
NEWMARKET
PORTSMOUTH
CANDIA
EPPING
GREENLAND
Portsmouth
NEWFIELDS
RAYMOND
Epping
Newfields
Pierce Island
STRATHAM
Rockingham Co.
Exeter
RYE
FREMONT
BRENTWOOD
EXETER
NORTH HAMPTON
CHESTER
HAMPTON
SANDOWN
DANVILLE
KINGSTON
EAST KINGSTON
KENSINGTON
HAMPTON FALLS
Hampton
DERRY
SEABROOK
SOUTH HAMPTON
HAMPSTEAD
Seabrook
Massachusetts



NEW HAMPSHIRE SENATE
107 North Main Street
Concord, NH 03301-4951
(603) 271-2111
TDD Access: 1-800-735-2964



November 21, 2008

To: Karen O. Wadsworth

From: Senator Maggie Hassan

Enclosed please find the final draft report pursuant to SB 70, Chapter law 236:1, Laws of 2003 Great Bay Estuary Commission

The State of New Hampshire

General Court

Concord

(FINAL DRAFT) MEMORANDUM

DATE: August 5, 2008

TO: Honorable John H. Lynch, Governor
Honorable Sylvia B. Larsen, President of the Senate
Honorable Terie Norelli, Speaker of the House of Representatives
Tammy L. Wright, Senate Clerk
Karen O. Wadsworth, House Clerk
Michael York, State Librarian
Dick Green, Chair *Pro Tem*, Estuary Alliance for Sewage Treatment (EAST)

FROM: Sen. Maggie Hassan, Chair, Great Bay Estuary Commission

RE: Report Pursuant to SB 70, Chapter Law 236:1, Laws of 2003
Great Bay Estuary Commission

Provided herein are the findings and recommendations of the Great Bay Estuary Commission, established to investigate wastewater management alternatives in the state's coastal basin. Also attached is *NH Seacoast Region Wastewater Management Study – Final Alternatives Report (May 2008)*, prepared for the Commission by the engineering consulting firm of Metcalf & Eddy, Inc. The findings memorandum and alternatives report are prepared and submitted in partial fulfillment of requirements of Senate Bill 70, Chapter Law 236:1, Laws of 2003.

Background / Executive Summary

New Hampshire Senate Bill 70, Chapter 236:1, Laws of 2003, established the Great Bay Estuary Commission ("GBEC" or "Commission") to study the feasibility of combining and conveying effluent from area wastewater treatment facilities for discharge to the Atlantic Ocean, as well as other wastewater management alternatives, in an effort to restore water quality and habitat in the Great Bay estuary.

The Commission was comprised of appointees and delegates from the senate, house, governor's office, two state agencies, two regional planning commissions, two county commissions, the Great Bay National Estuarine Research Reserve, the Coastal Conservation Association of New Hampshire, the NH Commercial Fishermen's Association, and 44 participating cities and towns in the state's coastal basin. Routine Commission meetings were augmented by participation by representatives of the Conservation Law Foundation, NH Rivers Council, The Nature Conservancy, and other stakeholders.

In August 2004, the Commission selected a study team led by Metcalf & Eddy (M&E) to assist in identifying and investigating the feasibility of possible regional options for treating and disposing of the region's wastewater.

During its Preliminary Findings Report stage of study, M&E developed a preliminary list of ten long-term wastewater management alternatives potentially available to coastal basin communities. In March 2006, these ten alternatives were presented to Commission members, the public and stakeholders at a planning charrette – an all-day informational and brainstorming session – to gather public input on the ten alternatives. Based in part on the charrette's findings, the Commission identified and designated four of the management alternatives for additional study. The four alternatives designated for further development and evaluation are as follows:

Alternative 1 – No Action (Treatment at Existing WWTFs and Discharge at Existing Locations). Under this alternative, wastewater treatment would continue at each of the seventeen municipal wastewater treatment facilities ("WWTFs") in the coastal basin, with treated effluent discharged to surface waters at existing locations. Existing facilities would be expanded over time to accommodate growth and upgraded as necessary to comply with increasingly stringent federal pollutant discharge limitations. This alternative establishes a future baseline scenario against which other alternatives are compared.

Alternative 2 – Treatment at Existing WWTFs with a Regional Gulf of Maine Discharge. Wastewater treatment would continue at each of the seventeen municipal WWTFs in the study area. However, secondary-treated effluent from these WWTFs would be collected and conveyed to a regional disinfection facility and then discharged through a regional outfall into the Gulf of Maine. This alternative is included because its study is specifically required by Senate Bill 70.

Alternative 3- Decentralized Treatment and Continued Use of Existing WWTFs. Under this alternative, existing municipal WWTFs would treat current wastewater flows *plus* one-third of projected future flows. The remaining two-thirds of future wastewater flows would be conveyed to decentralized (e.g. on-lot; cluster) systems for treatment and subsurface disposal. This alternative was included in response to public testimony requesting that decentralized treatment be included as part of any regional solution.

Alternative 4 – Treatment at Existing WWTFs and Discharge to Land Application Sites. Wastewater treatment would continue at each of seventeen municipal WWTFs in the study area. However, treated effluent would be conveyed and disposed to specific land application sites instead of to surface waters. This alternative focuses on local land application of treated wastewater and hence complements the study by considering all disposal options.

At the Commission's direction, M&E conducted a planning level analysis to evaluate the four management alternatives against a common array of environmental, non-monetary and cost considerations. The comparative evaluation is not exhaustive and does not purport to identify or address all manner of potential issues and concerns. Many of the criteria are qualitative in nature, employ a degree of subjectivity, and are not ranked or weighted as to relative importance. The evaluation criteria include:

*Environmental Impact Analysis, including:
- Land Use and Growth
- Air Quality
- Surface Water Flow, Groundwater Recharge, and Water Quality
- Wetland and Terrestrial Resources
- Aquatic Resources
- Rare and Endangered Species

*Non-Monetary Analysis, including:
- Complexity
- Public Testimony
- Implementation

* Planning Level Construction Costs

The relative benefits and impacts of each alternative are presented in summary form in Tables 1, 2 and 3 of this memorandum. The brevity and simplicity of the tables belie the true complexity of the evaluation, and therefore stakeholders are referred to M&E *Final Alternatives Report*, Sections 5–8, for more detailed discussion.

Table 1 - Environmental Impact Matrix

Adapted from: ***Final Alternatives Report*****, Sections 5-9 (M&E, May 2008)**

Impact Parameter	Alternative 1 - No Action (Treatment at Existing WWTFs)	Alternative 2 - Regional Gulf of Maine Discharge	Alternative 3 - Decentralized Treatment plus Existing WWTFs	Alternative 4 - Existing WWTFs w/ Land Application
Land Use and Growth	Least amount of impact to land use Growth and development would follow existing trends and patterns	Relatively minor impacts to land use Would potentially result in indirect growth and development	Would directly impact hundreds of acres of land Could potentially limit growth	Would directly impact hundreds of acres of land Could potentially result in some indirect growth
Air Quality	Minimal impacts	Minimal impacts	Minimal impacts	Minimal impacts
Surface Water Flow, Groundwater Recharge, and Water Quality	Minimal impacts to surface water flow Localized reduction in groundwater levels Potential improvement to water quality in receiving waters and Great Bay Minimal effect on Gulf of Maine water quality	Would result in a reduction in receiving water surface flow Localized reduction in groundwater levels Potential improvement to water quality in receiving waters and Great Bay, with some impacts unknown without further study Increased cumulative contribution of nitrogen to Gulf of Maine	Minimal impacts and/or localized reduction to surface water flow Groundwater and local streams would be recharged Potential improvement to water quality in receiving waters and Great Bay Minimal effect on Gulf of Maine water quality	Minimal impacts and/or localized reduction to surface water flow Groundwater and local streams would be recharged Potential improvement to water quality in receiving waters and Great Bay Minimal effect on Gulf of Maine water quality
Wetland and Terrestrial Resources	Minimal/localized impacts	May result in loss or alteration of wetland and upland/terrestrial habitat in Great Bay	Minimal/localized impacts; Would help support wetlands	Minimal/localized impacts; Would help support wetlands; Some loss of upland/terrestrial habitat
Aquatic Resources	No significant effects on aquatic life	Reduction in base flow to Great Bay, with potential adverse effects on aquatic resources	No significant effects on aquatic life	Some localized stream flow and aquatic life effects
Rare and Endangered Species	No significant alterations to R&E habitat and species	R&E species habitat in Great Bay may be altered	No significant effects	Could diminish habitat downstream of existing WWTF discharges

Table 2 - Non-Monetary Impacts Matrix

Adapted from: *Final Alternatives Report*, Sections 5-9 (M&E, May 2008)

Impact Parameter	Alternative 1 - No Action (Treatment at Existing WWTFs)	Alternative 2 - Regional Gulf of Maine Discharge	Alternative 3 - Decentralized Treatment plus Existing WWTFs	Alternative 4 - Existing WWTFs w/ Land Application
Complexity	Shares second-most stringent effluent limits Shares least complex conveyance needs	Least stringent effluent limits and least complex treatment facilities Most complex conveyance needs and disposal component	Shares second-most stringent effluent limits Shares least complex conveyance needs	Most stringent effluent limits and most complex treatment facilities Second most complex conveyance needs
Public Testimony	Received little direct positive or negative public testimony	Produced majority of the negative public testimony	Alternative included as result of supportive public testimony	Received little direct positive or negative public testimony
Implementation	Easiest alternative to implement	Most difficult alternative to implement Requires intermunicipal agreements and siting of regional pipelines and pumping stations Partial loss of town wastewater autonomy	Relatively easy to implement Difficult to implement decentralized system components	Difficult to implement Requires groundwater discharge permits and siting of effluent pipelines

Table 3 – Construction Cost Matrix

Adapted from: *Final Alternatives Report*, Sections 5-9 (M&E, May 2008)

Cost Parameter	Alternative 1 - No Action (Treatment at Existing WWTFs)	Alternative 2 - Regional Gulf of Maine Discharge	Alternative 3 - Decentralized Treatment plus Existing WWTFs	Alternative 4 - Existing WWTFs w/ Land Application
Treatment Cost	$ 110,600,000	$ 73,800,000	$ 92,000,000	$ 172,000,000
Conveyance Cost	$ -	$ 396,000,000	$ -	$ 113,900,000
Disposal Costs	$ -	$ 119,300,000	$ 119,500,000	$ 26,800,800
Total	**$ 110,600,000**	**$ 589,100,000**	**$ 211,500,000**	**$ 312,700,000**

Commission Recommendations

As agreed with the GBEC, NHDES, and attendees of the project charrette, the M&E *Final Alternatives Report* – a compact disc version of which in included as Appendix B of this memorandum - neither prioritizes the four wastewater management alternatives nor recommends a preferred alternative to carry forward. It is acknowledged that further development and analysis may be necessary before any alternative is implemented.

Based on the report findings, and after due consideration, the Commission neither endorses nor recommends any specific wastewater management alternative to carry forward. Rather, the Commission recognizes that each of the four alternatives is possessed of unique benefits, impacts and implementation challenges – economic, environmental, legal, political, regulatory and technical – and must comply with goals of the Estuaries and Clean Water Act of 2000. One or more of the wastewater management alternatives or a combination of the alternatives warrant further consideration by coastal basin communities, whether acting individually, severally or regionally.

Some Commission members and stakeholders expressed objection to Alternative 2 (Gulf of Maine Discharge), arguing this alternative has significant negative impacts that are incompletely addressed by the report, and would be the most difficult and costly of the alternatives to implement. Correspondence articulating the views of these parties is included as Appendix A of this memorandum.

The GBEC finds that Alternative 2 is costly, raises important environmental concerns, and does not appear economically feasible at this time. Nevertheless, the alternative may warrant consideration in the future in view of advancing treatment technologies, improved scientific understanding of the natural environment, evolving environmental priorities and trade-offs, and competing public needs.

The GBEC notes that disposal of wastewater biosolids (sludge), septage materials and Fats, Oil and Greases (FOG) is of growing concern to communities in the coastal basin and statewide. Improved septage/sludge/FOG handling capabilities could be provided at the larger WWTFs, at WWTFs during process upgrades, and/or at regional facilities as part of the four wastewater management alternatives.

The wastewater management alternatives report is the result of considerable effort, and is rich in content, data and analysis. It represents a valuable planning tool for future use by coastal basin communities, planning agencies, and other stakeholders.

A complete archive of report materials and study data will be maintained by NHDES for public access at its web site, www.des.state.nh.us, and also at regional planning commission offices.

Feel free to contact me if you need clarification or additional information regarding the GBEC and its study findings.

Respectfully submitted,

Maggie H

Senator Maggie Hassan, Chair
Great Bay Estuary Commission

Appendix A - Letters of Comment
Appendix B - Final Alternatives Report (M&E, May 2008)

cc: Great Bay Estuary Commission Members

APPENDIX A – Letters of Comment

Correspondence – Erik Anderson, President, NH Commercial Fishermen's Association (February 6, 2008)

Letter - Alan Gould, Town Administrator, Town of Rye, NH (February 14, 2008)

Joint Letter - Thomas Irwin, Senior Atty., Conservation Law Foundation; Carl Paulsen, Program Director, NH Rivers Council; and Ray Konisky, PhD, The Nature Conservancy – NH Chapter (February 21, 2008)

Letter - Hal Weeks, Assistant Director, Shoals Marine Laboratory (March 20, 2008)

Letter - Doug Bogan, NH Program Director, Clean Water Action (May 15, 2008)

APPENDIX B – Final Alternatives Report

Compact Disk - NH Seacoast Region Wastewater Management Feasibility Study – Final Alternatives Report (M&E, May 2008)

Great Bay Estuary Study Committee

For the purposes of discussion and consideration of action the following statement is made:

That the Great Bay Estuary Study Commission recommend "Alternative 2" as a non-preferred alternative as reported in the "New Hampshire Seacoast Region Wastewater Management Feasibility Study" report submitted by Metcalf & Eddy Environmental Consultants. The committee would forward this recommendation in its closing transmittal report.

Rational

Section 6.0 of the report contains a variety of concerns, uncertainties, additional study and cost to fully vent to consider this a viable alternative.

1) ASPECTS OF NEGATIVE LAND USE

6.1.1 Land Use and Growth – "Land acquisitions and/or easements are anticipated for portions of the conveyance piping crossing private property" There is a recognized concern for this negative aspect of land use.

2) CONCERNS TO NEGATIVE ASPECTS OF INDIRECT GROWTH

6.1.1 – Indirect Growth – "this alternative could potentially result in indirect growth and development as a result of the less restrictive treatment requirements for the gulf discharge." While this statement is poised as neither a negative or positive effect it is further stated in the document that resulting indirect growth and development could have a negative effect for estuary concerns from other discharge issues related to this event whether from a non-point sources or others.

3) CONCERNS TO NEGATIVE ASPECTS OF GROUNDWATER RECHARGE, ESTUARY WATER QUALITY, & GULF OF MAINE WATER QUALITY

6.1.3 – Surface Water Flow, Groundwater Recharge, and Water Quality

Item 1 – "As a result of the redirection of WWTF effluent to the Gulf, there would be a reduction in the existing receiving water surface flow, and potentially, groundwater levels downstream and in the vicinity of the existing WWTF's."

Item 2 – "Under this alternative, there would be no increases in the groundwater recharge with the exception of discharges from new on=lot systems within the study area. It is possible that with the reduction in the stream flows that the migration of groundwater to these streams may increase. The subsequent effect of this increased migration is the possible lowering of groundwater levels which may result in the reduction of groundwater supplies and habitat in the study area."

Item 3 – Great Bay Salinity Changes – " However, given the sensitivity of resources in the estuary, should this alternative be selected for possible implementation, more detailed modeling to determine localized effects due to stratification and potential salinity changes should be conducted"

Item 4 – Within this section there is discussion on the ammonia nitrogen loading considerations for the Great Bay Estuary System. There is concern that

transferring the loading issues of this subject to the Gulf of Maine is a negative impact.

Item 5 – "One potential concern with regard to water quality in the Great Bay would be the effect that reduction in stream flow would have on downstream dilution for other pollutant sources. In receiving waters....it is possible that water quality conditions could be degraded to some degree as a result of less dilution for pollutants from other non-point sources, such as on lot septic systems.

Item 6 – Gulf of Maine Water Quality Impacts – With the discussion it is stated that " Additionally, benthic communities are not anticipated to be impacted since the effluent is expected to rise immediately after discharge as its density is lighter than saltwater, however, it is expected that salinity would need to be monitored over the long term should this alternative be considered for implementation.

COMMENT – This section only addresses the benthic community and appears to disregard other water column communities that could be effected. The discharge area discussed is a very important area with regards to spawning events for important groundfish species. After the occurrence of major spawning events for Gulf of Maine cod the larvae spends periods of time in a variety of depths within the water column and are very vulnerable to water quality issues that could be influenced by this alternative. This is also true for a variety of species important to the ecosystem structure of the Gulf of Maine and CAN NOT be ignored in the discussion of this alternative.

4) NEGATIVE CONCERNS TO WETLAND & TERRESTIAL RESOURCES

6.1.4 – Wetland and Terrestrial Resources – There are a variety of concerns represented in this section of the report that are of concern. The report is not conclusive on this matter and repeatedly states need for detailed analysis and monitoring if this alternative is chosen

5) CONCERNS TO "ESSENTIAL FISH HABITAT"

6.1.5 – Aquatic Resources

Item 1 – Increase and Decrease in Flow (Great Bay Receiving Waters) – "As a result of modifications in base flow, aquatic resources could be potentially adversely affected in some receiving waters. Great Bay has been designated as Essential Fish Habitat for feeding, breeding, nursing, and protection during juvenile and larval stages for many fish species, Thus alterations in flow that would affect aquatic life would be of concern."

6) CONCERNS TO RARE AND ENDANGERED SPECIES

6.1.6 - Rare and Endangered Species

Item 1 – Great Bay Receiving Waters – "As noted above, the modeling indicates that the change in salinity in tidal receiving waters is expected to be negligible during low flow conditions. However, because of the presence of protected species in several of these receiving waters , it is recommended that the effects during 7Q10 conditions be evaluated in greater detail if this alternative is considered further for implementation."

Item 2 – Gulf of Maine Discharge – "Thus, while the discharge itself is not anticipated to adversely affect the species, the existing water quality and the

contributions of other contaminants should be evaluated in future studies should this alternative be selected for further consideration."

7) CONCERNS TO COMPLEXITY OF THIS ALTERNATIVE

6.2.1 – Complexity –

Item 1 -"The proposed conveyance system for this alternative (described in Section 3.2) is anticipated to require more than 90 miles of effluent force mains and 30 pump stations. Many of these pump stations and pipelines are located in areas not necessarily adjacent to the existing WWTFS. These force mains and pumps would require routine operational attention and regular maintenance"

Item 2 – "The disposal component of this alternative is also complicated. It is anticipated that this alternative would require the construction of a RPTF."

8) PUBLIC TESTIMONY & CONCERN

6.2.2 – Public Testimony

Item 1 – "This alternative produced a significant amount of negative public testimony throughout the duration of the project. The majority of this negative public testimony can be divided into the following categories.

a) Concerns related to the inter-basin transfer and the "throwing away" of wastewater effluent that originated from a groundwater source."
b) Concerns of negatively impacting the water quality and environmental quality directly adjacent to the outfall discharge, around the outfall, as well as globally."
c) Concern that the development of regional sewer system would result in a rapid and uncontrolled expansion of secondary growth of the study area."

9) UNH AQUACULTURE PROJECT

Comment – The report failed to mention evaluating any consequences in the Gulf of Maine discharge alternatives to the existing and ongoing UNH Aquaculture Programs. Failure of commenting on this issue and the potential negative affects to both the finfish and muscle projects raises issues and concerns that were not commented on in the report.

10) MIGRATION OF MARINE SPECIES

Comment – The report does not well explain if there would be negative consequences in migration of marine species if this alternative was selected. Without question there are seasonal migrations of benthic and pelagic species important to the region both recreationally and commercially. While the report acknowledges a variety of water quality issues and questions it is not well understood if combinations of salinity, temperature, and flow will negatively effect traditional patterns and observations.

11) COSTS

Item 1 – Alternative 2 is the most expensive alternative of the alternatives presented in the report ($589,000,000)

Item 2 – It is not well developed or explained in the report as to the additional costs related to further studies needed, monitoring requirements of the system, maintenance requirements, and other cost related issues of the alternative.

Item 3 – It should be noted that the cost of this alternative ($589,000,000) is calculated with the nearest shore discharge site. If other more distant discharge sites

are used it may add costs upward to $50,000,000 - $60,000,000 in additional to the $589,000,000.

Town of Rye • Office of Selectmen • 10 Central Road • Rye, NH 03870
603-964-5523 • Fax 603-964-1516

February 14, 2008

Mr. Stephen Roberts
NH Department of Environmental Services
6 Hazen Drive
P.O. Box 95
Concord NH 03302

Dear Mr. Roberts:

Please consider this letter as the Town of Rye's official response to a call for comments regarding the Great Bay Estuary Commission and the "New Hampshire Seacoast Region Wastewater Management Feasibility Study".

Rye strongly objects to Alternative 2, "Treatment at Existing WWTFs with a Regional Gulf of Maine Discharge". This alternative would have a significant negative impact on ocean water quality, the fishing industry, tourism, and quality of life for our residents. With approximately one half of the State's coastline and four islands located about seven miles off our shore, Rye will bear the burden of feeling these impacts even more than many of the other communities in the seacoast region.

The Metcalf and Eddy report touches briefly on some of the negative consequences of a regional outfall pipe, as indicated in the attached excerpts from the report.

For residents and visitors to Rye it is hard to imagine effluent being discharged into the Gulf of Maine between our beaches and the Isles of Shoals. We have known that the Gulf of Maine is like a shallow bowl and most of what is deposited in the "bowl" drifts within the "bowl", eventually being deposited on our shoreline. We wonder what effect this would have on people that visit our beaches. This outfall pipe would certainly have an impact on tourism, the local economy, aquaculture and property values.

The seacoast is part of a very important but fragile ecosystem that many communities have fought long and hard to protect. When reading this report it is obvious that there are many unknowns. Much of the discussion regarding the impact of this alternative is incomplete as evidenced by the many references to "should be evaluated in future studies should this alternative be selected for further study." This ecosystem is much too valuable to jeopardize with uncertainties when there are other options available.

It is perfectly clear from the limited work completed to date that a major discharge to the Gulf of Maine off the coast of Rye is fatally flawed, both from an environmental standpoint, and with respect to cost, as the $589 million estimated cost renders this option unfeasible. It has been clear to many in Rye that the Gulf of Maine discharge option has been fatally flawed since this planning process began.

Rye believes that a better solution to the problem is to encourage regional treatment facilities supported by inter-municipal agreements. We have a longstanding history of excellent cooperation on wastewater issues with the Town of Hampton and the City of Portsmouth, and we look forward in the future to continuing these relationships in a mutually beneficial fashion which preserves and enhances water quality in the seacoast region.

Thank you for the opportunity to provide input.

Very truly yours,

Alan S. Gould
Town Administrator
Attachment
Cc: The Honorable Martha Fuller Clark
The Honorable David Borden
The Honorable Otto Grote
The Honorable Margaret Wood Hassan
Rye Conservation Commission
Rye Planning Board
Rye Sewer Commission

Attachment A: Selected Excerpts from "New Hampshire Seacoast Region Wastewater Management Feasibility Study", by Metcalf and Eddy, Inc.

6.1.1 Land Use and Growth

"Land acquisitions and/or easements are anticipated for portions of the conveyance piping crossing private property."

"Depending on the final siting of the RPTF, the facility could result in an aesthetic impact to adjacent land uses."

"...this alternative could potentially result in indirect growth and development as a result of the less restrictive treatment requirements for the gulf discharge. These less restrictive treatment requirements may allow the existing WWTFs to process additional flow that they may not be able to accommodate with stricter discharge limits."

6.1.3 Surface Water Flow, Groundwater Recharge, and Water Quality

"As a result of the redirection of WWTF effluent to the Gulf, there would be a reduction the existing receiving water surface flow and, potentially, groundwater levels downstream and in the vicinity of the existing WWTFs."

"For several of the receiving waters, there would be a fairly significant reduction in stream flow."

"This reduction in river flow would potentially affect a variety of downstream uses including provision of water supply and sustaining of coastal vegetation and aquatic habitat. For example, the Lamprey River is a designated Wild and Scenic River and protected by Instream Flow Rules. Compliance with flow standards is required, and any reduction in stream flow would jeopardize the ability to comply."

"It is possible that with the reduction in stream flows that the migration of groundwater to these streams may increase. The subsequent effect of this increased migration is the possible lowering of groundwater levels which may result in the reduction in groundwater supplies and habitat in the study area."

Water Quality

"As a result of the reduction in freshwater flow, there is a potential for an increase in salinity concentrations and or movement of the salt wedge in the receiving waters that are under tidal influence."

"One potential concern with regard to water quality in the Great Bay would be the effect that reduction in stream flow would have on downstream dilution for other pollutant sources."

"...it is possible that water quality conditions could be degraded to some degree as a result of less dilution for pollutants from other non-point sources, such as on-lot septic systems."

Gulf of Maine Water Quality Impacts

"It is expected that continued discharge of treated wastewater effluent to the gulf would increase cumulative contribution of nitrogen and other wastewater constituents to the marine environment, and that monitoring would be needed to ascertain the magnitude of the increase and effects on water quality."

6.1.4 Wetland and Terrestrial Resources

"The hydrologic changes, including reduction in stream flow and potential reduced groundwater levels that would occur as a result of redirecting wastewater flow to the Gulf of Maine, may result in changed wetland and terrestrial habitat in receiving waters, including reduced wetland acreage."

"Because of the sensitivity of wetlands vegetation and coastal habitat in estuaries, it is recommended, however, that more detailed analysis of salinity be conducted if this alternative is selected for further consideration. For example, a wetland community that may be sensitive to changes in salinity includes the high salt marsh, which is listed as a significant natural community along the floodplains of the Lamprey and Oyster Rivers. High salt marshes are among the most biologically productive systems on earth and support a vast array of plants and animals, including many species of migratory birds (NHNHB, 2005). Another significant natural community that would be sensitive to changes in salinity is the low brackish tidal riverbank marsh, also found along the floodplain of the Lamprey River."

"The siting of facilities, including conveyance pipelines and pump staions, may require taking of terrestrial habitat...it is expected that attempts will be made to site these components in public rights-of-way to extent possible. However, some loss of terrestrial/upland habitats would be expected. Terrestrial wildlife may also be indirectly impacted by adverse impacts to aquatic resources and riparian communities."

6.1.5 Aquatic Resources

"As a result of the modifications in base flow, aquatic resources could potentially be adversely affected in some receiving waters. Greta Bay has been designated as Essential Fish Habitat for feeding, breeding, nursing, and protection during juvenile and larval stages for many fish species; thus alterations in flow that would affect aquatic life would be of concern."

"There is concern that the relocation of Newmarket WWTF discharge from Lamprey River to the Gulf of Maine could affect downstream salinity concentrations in the river, which could in turn affect resident fish."

"Aquatic life would also be affected by potential changes in water quality that may occur as a result of the relocation of WWTF effluent to the Gulf."

6.1.6 Rare and Endangered Species

To the extent that surface water flow and groundwater levels are reduced due to the transfer of WWTF effluent out of the basins to a Gulf of Maine discharge, the habitat of local rare and endangered species may be altered."

"Existing data show that in these receiving waters, seven rare and endangered plant species and one exemplary community are identified in the vicinity of the Newmarket WWTF. Rare and endangered species in the vicinity of the Rochester WWTF...include three plant and three vertebrate species and two exemplary natural communities."

"...it is recognized that effects to aquatic species are based on cumulative effects in both inland and offshore environments. Thus while the discharge itself is not anticipated to adversely affect the species, the existing water quality and the contributions of other contaminants should be evaluated in future studies should this alternative be selected for further consideration."

6.2.1 Complexity

"The conveyance component of this alternative of this alternative is complex." "The proposed conveyance system for this alternative is anticipated to require more than 90 miles of effluent force mains and 30 pump stations...These force mains and pump stations would require routine operational attention and regular maintenance."

"The disposal component of this alternative is also complicated."

"...a significant outfall monitoring program would likely be required by the regulatory agencies."

6.2.2 Public Testimony

"Concerns related to inter-basin transfer and the throwing away of the wastewater effluent that originated from a groundwater source."

"Concerns of negatively impacting the water quality and environment quality directly adjacent to the outfall discharge, around the outfall, as well as globally." "Concerns that the development of a regional sewer system would result in a rapid and uncontrolled expansion or secondary growth of the study area."

6.2.3 Implementation

"The implementation of this alternative would be relatively difficult."
"Under this alternative, each community would lose part of its wastewater autonomy."

6.3 Planning Level Construction Costs

"Total Cost $589,100,000"

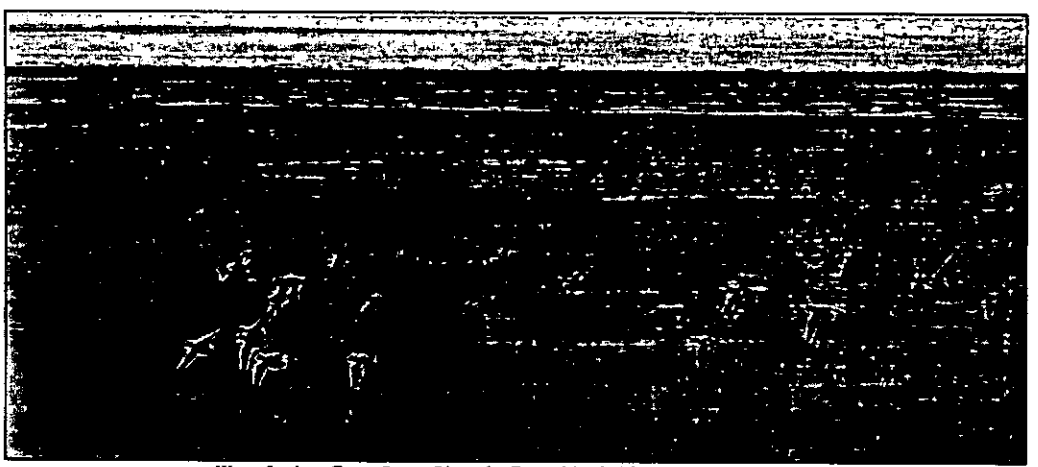
TOWARD A HEALTHY GREAT BAY ESTUARY AND A SUSTAINABLE SEACOAST: A NEW FRAMEWORK FOR SEWAGE WASTEWATER MANAGEMENT AND PLANNING IN NEW HAMPSHIRE'S COASTAL WATERSHED

ANALYSIS AND RECOMMENDATIONS OF THE CONSERVATION LAW FOUNDATION & THE NATURE CONSERVANCY

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Waterfowl on Great Bay – Photo by Eric Aldrich, The Nature Conservancy

The Conservation Law Foundation (CLF) is a nonprofit environmental advocacy organization with offices in New Hampshire, Maine, Massachusetts, Rhode Island and Vermont. CLF works to solve the environmental problems that threaten the people, natural resources and communities of New England. It has been closely monitoring the Seacoast Wastewater Management Study that is the subject of this paper as part of an ongoing Great Bay Initiative – a multi-pronged campaign to protect the Great Bay estuary from ever-mounting threats to its health. In addition to working on issues specifically related to the Great Bay estuary, CLF has an active marine program, aimed at protecting New England's valuable ocean resources and fisheries.

The Nature Conservancy (TNC) is an international nonprofit organization with a mission of preserving the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Within New Hampshire, the Great Bay estuary has been identified as a high priority site because of its exceptional ecological resources. TNC serves as the lead land acquisition agent for the Great Bay Resource Protection Partnership, a collaboration of nine local, state and federal agencies and nonprofit organizations which, since 1994, has protected some 4,000 acres of critical habitat in the Great Bay watershed. Local communities and other organizations have protected an additional 3,000 acres that the Partnership has been able to use as match to leverage federal funding.

INTRODUCTION

Soon, New Hampshire's Seacoast region will be poised to make a decision that will forever determine – for better or worse – the future health of the Great Bay estuary and the forty-four communities in the seacoast watershed. That decision – how best to manage sewage wastewater in the face of growing population pressures – is the subject of a $1 million New Hampshire Seacoast Wastewater Management Study (Study) that is currently underway. Set into motion by the Legislature's passage of Senate Bill 70 in 2003, the Study is being conducted by Metcalf & Eddy, in coordination with the Great Bay Estuary Commission. As part of the Study, Metcalf & Eddy recently published a Preliminary Findings Report, which is intended to provide an overview of existing conditions in the Seacoast watershed, and an Alternatives Development Methodology, which identified ten potential wastewater management alternatives based on engineering considerations.

The Study is now at a critical juncture. On March 25, 2006, Metcalf & Eddy will conduct a day-long "charrette" to obtain public input and, ultimately, to determine what wastewater management alternatives will be the subject of further, detailed evaluation as the Study proceeds. At the charrette, Metcalf & Eddy will present the ten alternatives identified in its Alternatives Development Methodology. The ten alternatives, discussed in Part II of this paper and set forth in Table 2, include four alternatives that involve the centralized collection of wastewater from locations throughout the watershed for regional discharge (after treatment) into the Gulf of Maine. For purposes of this paper, these alternatives are collectively referred to as the "regional ocean outfall" alternatives. The ten alternatives also include options involving the use of existing wastewater treatment plants and discharge locations, as well as various groundwater infiltration strategies. Of the ten alternatives, it is anticipated that four will be selected for detailed consideration as the Study proceeds.

The purpose of this paper is to share the analysis and recommendations of the Conservation Law Foundation (CLF) and The Nature Conservancy (TNC) on how the Study's various alternatives should be assessed and how, ultimately, a sustainable wastewater management solution should be selected. TNC and CLF view the Study as a critical, determining factor in the long-term health of the Great Bay estuary and New Hampshire's Seacoast region. In short, the Study has the potential to result in a wastewater management solution that protects valuable estuarine and ocean resources while putting the Seacoast region on a clear path to sustainable development. Alternatively, it has the potential to result in a costly, apparently "simple fix" that jeopardizes valuable freshwater, estuarine and ocean resources while fueling land- and water-consuming, water-polluting, sprawl.

Part I of this paper describes the need to consider the region's wastewater management issues within a broad context that looks beyond mere engineering considerations. It urges detailed consideration of the significant ecological, economic and cultural values of the Great Bay estuary, the Gulf of Maine, and the numerous fish and other species that depend on them, as well as significant growth pressures in the Seacoast region and the sprawling development patterns that have taken root.

Viewing the issue of wastewater management through this broader context, Part II describes three Essential Criteria that all wastewater alternatives should be measured against, and

which the final selected alternative must satisfy. These Essential Criteria are: (1) protection and enhancement of the Great Bay estuary through the protection of water quality and natural hydrology; (2) protection of the Gulf of Maine; and (3) promotion of sustainable development within the watershed rather than low-density, water-polluting sprawl.

Part III of this paper applies the above criteria to the ten alternatives identified by Metcalf & Eddy. In doing so, it reaches the conclusion that:

- The two alternatives involving continued use of existing wastewater treatment facilities would likely satisfy the three Essential Criteria (if modified to include treatment system upgrades) and should be the subject of further, detailed study;
- The four alternatives involving regional ocean-outfall discharges fail to meet the Essential Criteria and should be rejected from further consideration; and
- One of the four regional land-application discharges *may* satisfy the Essential Criteria, provided concerns pertaining to hydrology and sprawl can be addressed through adequate decentralization and planning, and should be the subject of further, detailed study.

Part IV of this paper identifies three missing elements of the Study, each one of which should be addressed to ensure a meaningful analysis and a viable result.

CLF and TNC offer this position paper in the interest of having the Study direct its remaining resources towards evaluating potential outcomes that protect the Great Bay estuary and related ocean resources and place the Seacoast region firmly on a path to more sustainable growth.

I. THE LARGER CONTEXT: A "BIG-PICTURE" FRAMEWORK FOR SEWAGE MANAGEMENT AND PLANNING

In setting the Study in motion, Senate Bill 70 established the Great Bay Estuary Commission and, among other duties, charged it with assessing the feasibility of implementing a regional ocean outfall.[1] Fortunately, since the enactment of Senate Bill 70, the Commission has broadened the Study to include consideration of other alternatives that do not include a regional ocean outfall. Nonetheless, one of the greatest dangers of any feasibility study is that it will be dominated by engineering perspectives that ignore critical policy issues within a larger context. While the assessment of wastewater management approaches necessarily involves matters of engineering, consideration of critical social and ecological factors and policy issues must form the basis for any new system design. These factors and issues are outlined below to help provide the necessary contexts for developing effective wastewater treatment approaches that meet the Seacoast region's challenges of intense population growth and sprawl, and that protect the biological, cultural, and aesthetic resources that define and support New Hampshire's coastal communities and economy.

The Ecological Context: The Values, Functions and Vulnerabilities of the Great Bay Estuary and Gulf of Maine

Overview of the Great Bay estuary:
The Great Bay estuary is one of New Hampshire's most unique – and most sensitive – natural resources. Comprised of the Piscataqua River, Little Bay and Great Bay, and including within its watershed a mosaic of highly productive freshwater and tidal wetlands, the estuary is New Hampshire's largest and most complex estuary system. With a total drainage area of 930 square miles spanning 39 communities in New Hampshire, and another ten in Maine, the estuary receives freshwater flows from seven major rivers – the Oyster, Bellamy, Lamprey, Squamscott, Winnicutt, Cocheco and Salmon Falls Rivers – as well as several small tidal creeks. The mixing of these fresh waters with the influx of tidal flows provides for a unique, sensitive, and highly productive natural resource. The size of the watershed, stemming from the confluence of so many streams and rivers, means the health of the estuary is directly linked to the cumulative effects of land-use throughout the region.

Marine-habitat values:
The estuary contains a broad diversity of habitat types, including eel grass meadows, salt marshes, mudflats, channel bottom, and rocky intertidal zones. These diverse habitats provide critical breeding and nursery ground for finfish, shellfish and other invertebrates. Fish species depending on the estuary are numerous, and the National Marine Fisheries Service has designated Great Bay as Essential Fish Habitat for several fish species in various life stages (Table 1). Many of the finfish that rely on the estuary also spend portions of their life cycles in the Gulf of Maine, where they become part of the food web supporting other marine species as well as commercial and recreational fisheries. In addition to finfish, shellfish such as lobsters, oysters, mussels and clams also rely on the estuary, providing essential ecosystem services (e.g. water filtration) and supporting valuable fisheries. For all of the above reasons, the Great Bay estuary must be viewed not only as of critical value unto itself, but as an essential part of the larger marine ecosystem.

Table 1: **Great Bay Estuary: Essential Habitat for Fish Species:**	
American shad	Pollock
American eel §	Rainbow smelt §
Atlantic cod	Red hake
Atlantic herring	River herring
Atlantic mackerel	Sea lamprey
Atlantic sea scallop	Smooth flounder
Atlantic salmon *§	Striped bass
Atlantic silversides	White hake
Atlantic sturgeon §	White perch
Black sea bass	Window-pane
Bluefish	flounder
Haddock	Winter flounder
	Yellowtail flounder

* The Cocheco River, which is part of the estuary, is designated Essential Fish Habitat for Atlantic salmon for all of its life stages.

§ Listed as candidates, species of special concern, or endangered under the Endangered Species Act.

Habitat values for birds, mammals and plants:

In addition to supporting estuarine fish and invertebrates, the Great Bay watershed provides diverse and exemplary habitats that include thousands of acres of emergent marshes, fens, bogs, beaver flowages, Atlantic white cedar swamps, grasslands, and forests. Each of these distinct habitats provides essential resources for myriad plant and animal species. The estuary provides a major stopover point for 20 species of waterfowl, 27 species of shorebirds, and 13 species of wading birds. Birds depending on the estuary include numerous raptors (including bald eagles, osprey, and peregrine falcon), seabirds (including various terns, cormorants and gulls), wading birds (including various herons, bitterns and egrets), shore birds (including a variety of plovers and sandpipers), salt marsh birds (including Virginia Rail, American Kestrel and a number of hawk species), and waterfowl and diving birds (including common loon, Canada and snow goose, and a broad variety of ducks). Seventy-five percent of New Hampshire's overwintering waterfowl are found on Great Bay.[4] The estuary's watershed supports 66 species of rare plants and 12 types of natural communities. Mammals that use the estuary include harbor seals, as well as otter, beaver, mink, white-tail deer and red fox, which use aquatic and upland resources within the watershed.

Public and Private efforts to protect the estuary:

Because of its immeasurable value, the Great Bay portion of the estuary has been designated part of the National Estuarine Research Reserve, a national network of 26 reserves protected for long-term research and coastal stewardship. The New Hampshire Estuaries Project has led efforts, along with numerous governmental and non-governmental agencies, to promote greater understanding of the estuary and how it is threatened, and to abate those threats through a variety of initiatives. The public-private Great Bay Resource Protection Partnership – a collaboration of nine local, state and federal agencies and nonprofit organizations – is nationally recognized for its success in protecting critical shoreline and wetlands habitats. TNC has recently established a Great Bay project office and is working with partners to initiate new projects to help restore oysters and other estuarine species and habitats. Three volunteer-based programs – Great Bay Coast Watch, the University of New Hampshire (UNH) Marine Docents, and the Great Bay Stewards – engage hundreds of dedicated community members in a wide range of effective environmental education, research, and conservation projects. Numerous land trusts and other local entities also have recognized – and are working to protect – the incredible value of the estuary. All of this work is supported, directly and

indirectly, by the research output of local marine scientists – notably from the UNH Jackson Estuarine Laboratory and the Cooperative Institute for Coastal and Estuarine Environmental Technology. CLF, through a multi-year Great Bay Initiative, is working to complement the above efforts through advocacy aimed at promoting smart growth and ensuring proper implementation and enforcement of state and federal laws. And of course, most recently, the Great Bay Estuary Commission was established by the Legislature to address the issue of wastewater management and to fulfill other duties addressing restoration of the estuary.[5] As demonstrated by all of these efforts, the citizens of New Hampshire clearly treasure their coastal ecosystem and have spent substantial time and money "walking the talk" to protect it.

Threats to the Great Bay estuary's health: The intense interest and ongoing work to protect the Great Bay estuary is motivated not only by the estuary's incredible value, but also by its sensitivity and the ever-mounting threats to its health. Indicators and trends of significant concern to the health of the estuary include:

- Increasing nutrient levels in estuarine waters;
- Declining population trends for oysters and river herring;
- Shellfish-bed closures;[6]
- The continued loss of large, unfragmented open space in the coastal watershed due to sprawling development patterns;[7]
- Increasing watershed coverage by impervious surfaces (roads, roofs, parking lots, driveways)[8] and associated stormwater pollution;[9]
- The listing of every water body within the estuary (i.e., Great Bay, Little Bay, the Piscataqua River, and other rivers and related water bodies) on New Hampshire's "303(d) list" of impaired waters.[10]

One of the most troubling trends is an increase in nitrogen levels in Great Bay.[11] As recently as 2003, researchers had not yet observed signs of eutrophication – such as toxic, oxygen-consuming algae blooms – resulting from these increased levels of nitrogen. Recently, however, troubling signs of stress have begun to appear, largely in the form of nuisance algae which, under eutrophic conditions, can lead to depletion of oxygen, fish kills, the loss of critically important eel grass beds, and the decline of many of the estuary's functions.[12],[13] That these signs of stress have begun to appear should come as no surprise, given that nitrogen concentrations in Great Bay are now reaching the same levels that have led to serious problems in other east-coast estuaries, and given past and current growth pressures in the Seacoast region. Fortunately, the Department of Environmental Services has commenced the development of nutrient criteria for New Hampshire's estuaries – criteria that are highly relevant not only to the health of the Great Bay estuary but also to this Study.

In addition to concerns regarding rising nutrient levels, Great Bay has many areas that are closed year-round to shellfish harvesting due to excessive bacteria levels due in large part to inadequate wastewater treatment. The remaining "open" areas are frequently subject to temporary closures because of non-point pollution following rain events, due in large measure to runoff from the impervious surfaces of urban and suburban development.

The Gulf of Maine:
New Hampshire is blessed with valuable ocean resources that are part of the Gulf of Maine. These marine resources are of immeasurable consequence, providing important commercial, recreational and natural values, including support of New Hampshire's valuable fishing industry. It is imperative that the Gulf of Maine not be viewed as an ecosystem separate and apart from the Great Bay estuary. Rather, from the dynamic exchange of waters that occurs between the estuary and the ocean, to the migration of species between these resources, the Gulf of Maine and the Great Bay estuary are inextricably linked as part of a larger marine ecosystem. This means that the activities occurring in and around inland portions of the estuary – and further upstream into the watershed – can affect the long-term health of New Hampshire's ocean resources and the Gulf of Maine. In addition to protecting the state's ocean resources from activities occurring on the land within the estuary's watershed, it is essential that they be protected from new, significant discharges that could alter water quality, salinity and habitats in offshore waters. Any new point source discharges to the Gulf of Maine need to be considered in the context of the long term cumulative impacts of the rapid growth and development now occurring from Massachusetts to New Brunswick in Canada. This concern is especially relevant in light of the recent important reports of the Pew Oceans Commission and U.S. Commission on Ocean Policy, both of which conclude that our nation's coastal and ocean resources are in a state of crisis, due in large measure to intense coastal development.[14]

The Societal Context: Seacoast Population Growth and the Era of Sprawl

Intense population growth pressures in the Seacoast:
The Seacoast continues to be one of the fastest growing regions in New England's fastest growing state. Between 1990 and 2004, New Hampshire far outpaced all other New England states with a 17.2% increase in population.[15] In fact, for four straight decades New Hampshire has been the fastest growing state not only in New England, but in the entire nine-state Northeast region.[16] A substantial amount of this growth has taken place, and is projected to continue, in New Hampshire's Seacoast. Between 2000 and 2025, the population of Rockingham and Strafford Counties are projected to increase by 79,400 and 30,600 people, respectively.[17] These population pressures are consistent with trends throughout the country: a national study of coastal population trends predicts average increases of 3,600 people a day moving to coastal counties, resulting in a total coastal population of 165 million by 2015. [18]

Population growth in the Seacoast will place ever-increasing demands on the region's wastewater treatment facilities. Accordingly, the Study is an important effort to proactively plan for improved regional wastewater management. This planning effort requires an understanding of growth trends. However, it is essential to look beyond the simple increase in population numbers to consider how that growth will be accommodated by on-the-ground development in the Seacoast region.

Sprawling development patterns magnifying the impacts of population growth:
As startling as they may be, population projections for the Seacoast are really just the tip of the proverbial iceberg. Development trends in the Seacoast show that growth in the

region is, and continues to be, increasingly sprawling.[19] As stated by Metcalf & Eddy in its Preliminary Findings Report:

> Much of the development associated with [the Seacoast region's past, substantial] growth has been low density and sprawling in nature, contributing to the decentralization of the traditional New Hampshire community and resulting in the conversion of agricultural and forested lands to more intensive uses. The rate of growth in population has been outpaced by the increase of developed land, which is a strong indicator of sprawl. For instance, per capita land consumption in the state tripled from the 1950s (0.45 acre/person) to the 1990s (1.6 acre/person) (NHOEP, 2003).[20]

In other words, the per-capita development "footprint" needed to accommodate the Seacoast's increasing population has been, and is, growing. This dominant trend of low-density sprawl development means that land is being used inefficiently to accommodate new growth. Accordingly, compared to more compact, traditional forms of development that were typical before the days of sprawl, the effects of population growth are greatly magnified. This magnification of impacts occurs in many ways. For example, low-density sprawl patterns lead to the loss, fragmentation and degradation of wetlands, open spaces, and wildlife habitat. They also lead to more impervious surface-coverage from roads, roofs, parking lots and driveways. In New Hampshire's coastal watershed, impervious-surface coverage recently increased by 11,154 acres, from 24,349 acres in 1990 to 35,503 acres in 2000; this reflects an increase of 46% in only 10 years.[21]

The unnecessary addition of impervious surfaces associated with inefficient sprawl development poses a significant threat to the health of the Great Bay estuary by increasing polluted stormwater runoff, altering the hydrologic patterns of flood events, preventing natural aquifer recharge, and destroying or damaging wetland communities. As stated in the most recent *State of the Estuaries* report, the accelerated consumption of land associated with sprawl "is a threat to the habitats, health, and aesthetic quality of the watershed."[22] In addition to accelerated land consumption, low-density suburban-style development can greatly increase per capita water consumption as a result of irrigation of large lawns.

The impact of sprawl on aesthetic and cultural values:

The aesthetic value and quality of the Great Bay estuary cannot be overstated, and must not be overlooked. For in addition to its immeasurable value for the numerous fish and wildlife species that depend upon it, the estuary is an essential part of what makes New Hampshire's Seacoast so special to its human communities. Aesthetic qualities include scenic views, trails through unspoiled areas, access to natural shoreline and beaches, and opportunities to share bird-watching, fishing, boating, hunting and other recreational pursuits with family and friends. The estuary is a valuable recreational resource for New Hampshire citizens and tourists alike and provides a constant reminder of the region's natural, economic, and historic link to the sea. The negative ecological and economic impacts of low-density sprawl threaten these important values.

Additional costs of sprawl:
Sprawl in the Seacoast region has other significant costs. Sprawl development – with its greater reliance on new subdivision roads and infrastructure – is more expensive on a per-unit basis than traditional compact development and, therefore, exacerbates the region's ongoing shortage of affordable work-force housing. Sprawl also places greater demands on municipal budgets in terms of maintaining roadways and other associated infrastructure.[23] Sprawling development patterns also require more people to drive farther distances, meaning more traffic and pollution.[24] As compared to more compact, mixed-use development patterns – such as New Hampshire's historic downtown and town-center forms of development – sprawl also contributes to a loss of community character and social capital.[25]

II. ESSENTIAL CRITERIA FOR ASSESSING WASTEWATER MANAGEMENT APPROACHES AND SELECTING A WISE INVESTMENT

Properly viewing the issue of wastewater management in the larger context of ecological and societal conditions, it is readily apparent that any investment in a regional wastewater management solution should further the objectives of protecting the Great Bay estuary, protecting New Hampshire's valuable ocean resources, and accommodating population growth through more sustainable development patterns. The goal of the Study should be to identify, study and ultimately select a wastewater management solution that achieves these objectives. Accordingly, as alternatives are reviewed and narrowed at the charrette, and subsequently evaluated as the Study proceeds, they should be measured against – and be required to satisfy – each of the following Essential Criteria:

Essential Criteria 1. Any wastewater management solution needs to protect and enhance the health of the Great Bay estuary.

The tremendous ecological, cultural and economic values of the Great Bay estuary must be restored and preserved using strategies that protect and enhance the estuary's long-term health and resilience. This will require careful attention to both the water quality and the hydrology of the rivers, bays and aquifers that comprise the estuarine system. Accordingly, this criterion includes the following related requirements.

Essential Criteria 1a. Any wastewater management solution must protect and improve the water quality of the estuary.

The outcome of the Study must lead to improvement of current water quality conditions by requiring better, further enhanced treatment that will decrease pollutant loadings to receiving waters.[26] Concentrations of several pollutants, particularly nitrogen, are already unacceptably high and, without action, can logically be expected to eventually reach and exceed threshold levels that could trigger widespread eutrophication, anoxic conditions ("dead zones"), and species loss. It is unfortunate that this Study is proceeding ahead of the Department of Environmental Services' development of nutrient criteria for the estuary, and as stated in previously submitted comments,[27] we urge Metcalf & Eddy to include more protective nitrogen standards for discharges to the estuary and rivers, and to include standards for phosphorous in estuary discharges.

It is critical to address the full suite of contaminants found in wastewater effluent, in addition to nutrients. Sewage contains a complex brew of pathogens (e.g. bacteria, viruses, and protozoa) and toxins (e.g. mercury, lead, and many chemicals from industrial, commercial, and residential activities).[28] Among toxic contaminants, pharmaceuticals and other household products are being recognized as a significant concern.[29] It is essential that the full range of contaminants be considered in addressing ways to better protect the water bodies directly receiving wastewater discharges, and the Great Bay estuary as a whole.

The adopted wastewater solution also needs to address and eliminate combined sewer overloads and any "wastewater blending" practices that may occur in the watershed,[30] as well ensure pre-treatment strategies to reduce the toxicity of the wastewater stream to the

fullest extent practicable. The Study needs to consider the sensitivities and conditions of each of the individual receiving rivers while also assessing the cumulative impacts to the Great Bay system from wastewater and other pollution sources (e.g. stormwater runoff and atmospheric deposition).

Essential Criteria 1b. Any wastewater management solution must protect the natural hydrology of the estuary.
It is imperative that the selected wastewater solution protect the natural hydrology of the estuary. Alternatives that return treated wastewater to nearby rivers or use land-application in the watershed of origin will "keep water local," meaning that freshwater will replenish surface water and groundwater resources within the watershed to better preserve the hydrology and base-flows of the water bodies flowing into the estuary. On the other hand, a system that includes an outfall location in the Gulf of Maine would disrupt natural conditions by "exporting" freshwater out of the watershed. This export would occur as a result of treated wastewater being discharged directly into the ocean, as opposed to the rivers within, and flowing into, the estuary. It also would occur as a result of system inflow and infiltration, a process in which groundwater seeps into underground sewer pipes. At the Deer Island treatment plant in Boston Harbor, for example, massive volumes of groundwater are exported out of inland watersheds; nearly 50 percent of all "wastewater" treated at the plant is the result of groundwater inflow and infiltration.[31] The loss of groundwater resources through inflow and infiltration could result in ecologically significant de-watering of the estuary's watershed, greatly exacerbating concerns about the sustainability of the Seacoast region's groundwater resources. A multi-year study of groundwater sustainability in New Hampshire's Piscataqua River and coastal watersheds is currently pending, and is nearing completion. That study, being conducted by the U.S. Geological Survey, will provide data of critical value to this Study.[32]

Exporting freshwater from the watershed also would disrupt natural salinity levels that are critical for estuarine plants and animals. Salinity alterations could have significant impacts, particularly for species that are already stressed. For example, Great Bay oyster populations persist at a very small fraction of historic levels and have been decimated in recent years, declining from a standing stock of more than 125,000 bushels of harvestable-size oysters in 1993, to a mere 3,579 bushels in 2002.[33] The protozoan pathogen MSX is thought to be one of the major causes of this decline.[34] Increased salinity levels, such as those caused by droughts or freshwater diversions, contribute to the prevalence of MSX infections and can expand the protozoa's range.[35] Local oyster researchers suspect that some low-salinity zones currently found in tidal rivers provide Great Bay oysters with refuges from disease.

In addition to adverse effects on oysters, alterations to the watershed's natural hydrology would likely have negative impacts to diadromous fish species like river herring. Remnant populations of river herring in some Great Bay rivers, notably the Exeter-Squamscott, are in decline. Reduced freshwater flow in summer, exacerbated by water withdrawals for human use, has been identified as one of the principal causes of juvenile river herring mortality in New England estuarine ecosystems.[36] Without enough water, young fish become trapped in rivers and subjected to low oxygen conditions. The efforts of federal and state agencies and their community partners to manage fish mortality and improve fish passage will come to naught

if young fish suffocate in freshwater, unable to reach the estuary.

Oysters and river herring are just two examples of species that would likely be impacted by hydrologic changes to the estuary. Estuarine habitats are defined by the natural blending of saltwater and freshwater. Salinity gradients mediate and control the distribution and abundance of nearly every plant and animal in the Great Bay estuarine system, and migratory fish like rainbow smelt, eels, salmon, shad, and river herring require maintenance of freshwater flows within natural ranges of variation to survive. For all of the above reasons, any regional wastewater solution must protect the natural hydrology of the estuary.

Essential Criteria 2. Any wastewater management solution needs to protect the Gulf of Maine.

As discussed above, New Hampshire's marine resources in the Gulf of Maine are a critically important ecological and economic asset. The protection of the Great Bay estuary is essential to protecting these marine resources – the estuary and Gulf of Maine are closely related parts of a single, dynamic marine ecosystem. As discussed above, it's also essential to protect the state's shared ocean resources by preventing significant new offshore discharges that will add new pollutants, disrupt natural salinity levels, and adversely impact marine habitat and fisheries. Last spring's red-tide bloom – New England's worst in decades, and possibly in recorded history – is a strong reminder of just how sensitive and important our ocean resources are. Extending from Maine to Cape Cod, and 20 miles east of Stellwagen Bank, this toxic algae bloom resulted in mass closures of shellfish beds in New Hampshire and throughout the region because of its threat to human health. It also has raised concerns for the health of seabirds and whales. These harmful algae blooms are fueled by nutrients that can be found in wastewater as well as stormwater runoff.[37] Although the majority of nutrients in the Gulf of Maine come from deep offshore waters, the long term cumulative impacts of nutrient loading from human sources are not yet well understood, and a precautionary approach is prudent. Alternatives that might cause harm to New Hampshire's sensitive and valuable ocean resources, and that rely on "dilution as the solution to pollution," must be rejected in favor of a more responsible approach. To date, Metcalf & Eddy's decision not to include a nitrogen standard for possible discharges to the Gulf of Maine, and to consider only conventional secondary treatment technology, greatly heighten these concerns.[38]

Essential Criteria 3. Any wastewater management solution needs to promote and support compact, sustainable development patterns.

The manner in which we manage and treat wastewater can have a tremendous influence – for better or worse – on development patterns. On the one hand, inappropriately planned wastewater infrastructure can result in harmful sprawl that degrades ecological resources and community character. These negative consequences can be caused by the construction of sewer lines that induce development in locations and densities that are inconsistent with community plans, and that "erode landscape patterns characterized by villages separated by open space."[39] They also can be caused by the creation of additional capacity and sewering, which can result in market forces (including increased land values and the desire of communities to recoup the costs of the wastewater infrastructure) that induce development where it otherwise might not occur, and that remove the density-constraints that might otherwise exist in rural and suburban areas historically not served by

sewers.[40] While it is possible to increase both wastewater treatment capacity and treatment efficiency, new water quality benefits can easily be offset by the additional impervious surface coverage and attendant stormwater pollution caused by induced growth.[41] It is important to note that reliance on on-site septic systems also can promote sprawl by requiring larger lots for on-site treatment and, as a consequence, the inefficient use of land. As one recent report notes: "[C]onventional onsite wastewater treatment systems are considered partly responsible for promoting wasteful land use patterns due to the land area needed to ensure proper wastewater treatment while also maintaining safe distances from water supply wells and surface waters."[42]

Rather than unwittingly promoting (and even publicly subsidizing) harmful sprawl, proper wastewater planning can be used as a tool to foster more compact, sustainable forms of development. For example, communities can make informed decisions about whether, or where, to extend sewer lines to direct growth where it is desired, and to prevent it where it is not.[43] Enhanced wastewater capacity also can be used as a tool to support higher-density development in city, town and village centers, and other designated growth areas, where communities want to direct development.[44] Advanced decentralized wastewater technologies also can allow the more efficient use of land for rural and suburban development, providing more effective use of land than otherwise occurs when individual septic systems are the norm. Such systems can be designed on a variety of scales to further a community's plans for growth (i.e., for individual lots, clusters of homes, or even a village center) and can provide a valuable tool for sustainable development.[45]

It is imperative that this Study address the strong connection between wastewater treatment infrastructure and land use patterns, and that its outcome discourage sprawl and promote more sustainable "smart growth" development. New Hampshire's Legislature has wisely recognized the importance of promoting smart-growth development as an alternative to sprawl, establishing by statute that: "It shall be the policy of the state of New Hampshire that state agencies act in ways that encourage smart growth."[46] Similarly, the Department of Environmental Services has adopted the following policy statement: "The New Hampshire Department of Environmental Services will encourage the application of smart growth practices, including minimum impact development practices, through education, outreach, and regulatory efforts."[47] Because the outcome of this Study will likely require a substantial investment of state funds in new infrastructure, and because the Study itself is funded by state dollars, the Department of Environmental Services should assertively assist in efforts to integrate smart-growth planning into the Study's identification and assessment of alternatives.

Viewing the issue of wastewater management without adequate appreciation of current trends and threats associated with population growth and sprawl could easily result in a wastewater management approach that enables and encourages precisely the type of development that jeopardizes the health of the Great Bay estuary and the sustainability of Seacoast communities. The Study presents a timely opportunity to recognize and better understand the issues of wastewater management as they relate to growth, to plan for more sustainable development, and to craft a solution that invests in and actively promotes compact smart-growth development.

III. APPLYING THE ESSENTIAL CRITERIA & RECOMMENDATIONS

Metcalf & Eddy has identified ten alternatives for the public's review and consideration at the March 25 charrette. These ten alternatives are set forth in Table 2 (page 18). Following the charrette, it is anticipated that of these alternatives, four will be selected for further, detailed analysis as part of the Study. Properly viewing these alternatives in the broader context, and applying the Essential Criteria contained in this paper, we believe certain alternatives should be carried forward for further, detailed review, while others should be rejected from further study.

Existing Wastewater Treatment Plants (Alternatives 1 and 2)

Of the ten alternatives, Metcalf & Eddy has identified two involving the use of all existing wastewater treatment facilities (WWTFs). Alternative 1 consists of treatment at existing WWTFs, with discharge of treated wastewater to existing surface-water discharge locations. Metcalf & Eddy describes this as a "No Action" alternative, in which "each individual community would continue to treat and dispose of its own wastewater flow in accordance with existing and future discharge limits imposed by the regulating agencies."[48] Alternative 2 consists of treatment at existing WWTFs, with discharges of treated water either to local individual land application sites, or to existing surface-water discharge locations. (It should be noted that the term "land application," as used in this Study, and in this paper, does not refer to the land application of sewage sludge; rather, it refers to the infiltration of treated wastewater effluent into groundwater.)

Essential Criteria 1a – Protecting water quality in the estuary: Alternatives 1 and 2 have strong potential to satisfy this criterion, especially if modified. We believe the Study should *not* view Alternative 1 as a "No Action" alternative. Rather, for both Alternatives 1 and 2, the Study should explore modern treatment technologies that could be used at the WWTFs to reduce levels of nutrients and other pollutants to the maximum extent practicable. In addition, the Study should address the significant water quality benefits of eliminating combined sewer overloads and any blending practices that may be in use, as well as improved pre-treatment programs aimed at reducing pollutant inputs from industrial sources.

Essential Criteria 1b – Protecting the natural hydrology of the estuary: By keeping treated freshwater "local," these alternatives will help maintain and protect the natural hydrology of the estuary and its watershed. Alternative 1 continues to discharge treated wastewater into surface waters, maintaining natural hydrologic cycles. With respect to Alternative 2, we believe the Study should pursue detailed consideration of local sites for each WWTF where land application technology could be used to maintain and enhance groundwater sustainability and groundwater base-flows for the estuary. In addition, the Study should model the extent to which land-based application could modify in-stream flows, especially during natural low flow periods (typically summer and early fall).

Essential Criteria 2 – Protecting the Gulf of Maine: Neither of these alternatives involves the discharge of wastewater directly into the Gulf of Maine.

Essential Criteria 3 – Promoting sustainable development: The Study should closely consider – in coordination with local communities – where, and how much, additional sewer capacity is needed for existing WWTFs to support higher density development in the places it is desired (i.e., city, town and village centers, and designated growth areas), and the level of upgrade that will be needed to accommodate that desired development. Working with communities, the Study also should view the extent to which the sewer networks tying into each WWTF can be used as a growth management tool to direct development where it is desired, and prevent it where it is not. With proper planning, these alternatives could help foster sustainable, compact development as opposed to land-consuming, water-polluting sprawl.

Recommendation: We believe Alternatives 1 and 2 have the strong potential to meet all three of the Essential Criteria. Moreover, it is important to note that these alternatives have the added benefit of fiscal responsibility – utilizing the substantial public investments that have already been made in existing WWTFs. Between 1988 and 1996 alone, there were a total of 20 upgrade projects, nine of which cost a total of $63 million.[49] In light of the additional costs associated not only with the other 11 upgrade projects during that timeframe, but also with the much higher costs of each plant's original construction, operation and maintenance, the Study should include a detailed analysis of the extent to which these investments can be leveraged with further upgrades and technological innovations. For the above reasons, we believe Alternatives 1 and 2 should be the subject of further, detailed study, with the caveat that such study include improved treatment technologies and a land use analysis of how continued investments in these plants and associated sewer infrastructure can promote and support more compact, sustainable development patterns as an alternative to sprawl.

The Regional Ocean Outfall Alternatives (Alternatives 3, 5, 7, 9)

Metcalf & Eddy has identified four alternatives involving regional outfalls to the Gulf of Maine. Two of those alternatives – Alternatives 3 and 5 – would involve the collection of wastewater from *all* existing WWTFs for an ocean outfall discharge. The other two – Alternatives 7 and 9 – would involve the collection of wastewater from Dover, Durham, Exeter, Newfields, Newmarket and Hampton for a regional ocean outfall discharge.

Essential Criteria 1a – Protecting water quality in the estuary: By transferring nutrients and other pollutants to the Gulf of Maine, each of the regional ocean outfall alternatives will likely provide some immediate water quality benefits for the estuary. However, as discussed below, the sewer infrastructure associated with these alternatives would likely encourage further sprawl, leading to additional stormwater pollution within the estuary and its watershed.

Essential Criteria 1b – Protecting the natural hydrology of the estuary: The regional ocean outfall alternatives would involve the export of treated freshwater, as well as the export of groundwater infiltrating sewer pipes, directly to the Gulf of Maine. In doing so, they would deprive the estuary and its watershed of valuable freshwater sources, significantly changing its natural hydrology and salinity levels.

Essential Criteria 2 – Protecting the Gulf of Maine: At a time when the public must better grasp the relationship between on-land activities and the health of our oceans, the regional ocean outfall alternatives would contribute to and condone a troubling "out-of-sight, out-of-mind" mentality to wastewater management. They would result in adverse direct and cumulative impacts to ocean resources through the collection and concentrated discharge of pollutants into the Gulf of Maine. This concern is greatly amplified by Metcalf & Eddy's decision not to include total nitrogen limits for discharges to the Gulf of Maine, and to consider only conventional secondary treatment standards as opposed to more protective treatment technologies and standards.[50] Even if the discharge were substantially treated in a way to minimize pollutant-loadings, an ocean outfall would nonetheless result in a large-volume discharge of freshwater into a saline marine environment and, therefore, alteration of natural salinity levels – a change that may have significant effects on the distribution and movement of lobsters and other marine life in the outfall vicinity.

Essential Criteria 3 – Promoting sustainable development: We are greatly concerned with the significant sprawl implications of a regional ocean outfall approach, and with the Study's failure to date to assess the significant relationship between a large, centralized wastewater systems and land use. Each of the regional ocean outfall alternatives could result in significant additional capacity that, through various market forces (including increased land values and the desire to recoup costs by adding more users to the system) could induce further intense development, including the extension of sewer pipes in a manner that promotes sprawl. In addition, two of the regional ocean outfall alternatives – Alternatives 5 and 9 – would involve connecting numerous communities to a single treatment facility. The infrastructure needed to do so could, itself, create a network of sewer lines that could fuel development, leading to a scenario in which development patterns are determined by sewer infrastructure as opposed to local community planning. While it may be possible to preclude sewer connections into such a system in places where development is not desired – such as through growth boundaries, legal restrictions and inter-governmental agreements – the long-term prospects for such a network encouraging sprawl could be high. As one report notes: "Sewer lines can be extended with the best of intentions, usually to remedy public health hazards. Once done, however, new growth to tie into the extended line becomes an expected consequence, necessary to pay user fees to cover the cost of that new infrastructure."[51] In addition to the desire to recoup costs, there could be intense political pressure by those seeking to tie into an established sewer network. The ecological impacts of sprawl associated with a regional outfall approach could result in a net degradation of the estuary, even taking into account whatever gains might result from eliminating pollutant loadings from wastewater treatment facilities in the watershed. As one report notes:

> Based on a growing body of evidence regarding the water quality impacts of runoff in urban areas with extensive pavement, it has become apparent that sewers often substitute one pollution problem for another. Increased runoff from impervious cover, loss of groundwater recharge, and increased risk of leaks and spills all lead to degraded water quality, even where sewers may have been installed to alleviate pollution problems.[52]

In sum, we believe the risks of further induced sprawl from a regional outfall approach are

high, and that insufficient attention has been given to the powerful influence such a system could have on land use patterns.

Recommendation: The regional outfall alternatives – Alternatives 3, 5, 7 and 9 – will not meet the Essential Criteria and, as such, do not warrant further study.

The Regional Land-Application-Discharge Alternatives (Alternatives 4, 6, 8, 10)

Metcalf & Eddy has identified four alternatives involving regional land-application discharges. Two of those alternatives – Alternatives 4 and 6 – would involve the collection of wastewater from *all* existing WWTFs for discharge of treated wastewater to one or more regional facilities for land application. The other two – Alternatives 8 and 10 – would involve the collection of treated wastewater from Dover, Durham, Exeter, Newfields, and Newmarket for regional land-application discharge. Metcalf & Eddy has not yet identified locations for land-application discharge sites.

Essential Criteria 1a – Protecting water quality in the estuary: These alternatives, by discharging treated wastewater to land-application sites, could provide further protections of water quality for the estuary. However, as discussed below, they also could encourage sprawl development and associated stormwater pollution.

Essential Criteria 1b – Protecting the natural hydrology of the estuary: These alternatives *could* protect the natural hydrology of the estuary, *depending on the selected locations of land-application sites.* We believe a single, regional land-application site will be insufficient to replicate natural hydrology, as it would involve exporting water out of sub-watersheds. Care must be taken to select the necessary number and locations of land-application sites to keep treated wastewater "local" within the sub-watershed of origin. To the extent these alternatives contemplate one, or just a few, land-application sites, it may be difficult for them to satisfy this criterion. The location, amount and timing of any land-application discharges would need to be selected to preclude negative impacts to fish and other estuarine resources that depend on natural hydrologic regimes. To the extent these alternatives involve large regional networks of sewer infrastructure, they also raise significant concerns regarding the inflow and infiltration of groundwater into the submerged sewer pipes.

Essential Criteria 2 – Protecting the Gulf of Maine: These alternatives do not involve the discharge of wastewater directly into the Gulf of Maine.

Essential Criteria 3 – Promoting sustainable development: Two of the regional land-application alternatives – Alternatives 6 and 10 – involve treatment of wastewater from numerous communities at a regional facility. Accordingly, these two alternatives raise some of the same concerns pertaining to the regional-treatment ocean outfall alternatives – namely, the creation of a network of sewer lines that could induce future sprawl. The other two regional land-application alternatives – like Alternatives 1 and 2 – could, with proper planning, promote more sustainable development patterns.

Recommendation: Though it is difficult to reach a final conclusion absent more information regarding the number and locations of potential land-application discharge sites, regional land-application solutions, particularly Alternatives 6 and 10, may fail to satisfy the Essential Criteria. While we believe land-application discharges could play an important

role, they are likely to be more protective of natural hydrology – and less likely to encourage sprawl – if pursued on a local, WWTF-specific basis, as contemplated in Alternative 2 and, possibly, on the scale contemplated in Alternative 8.

Table 2: **Preliminary Wastewater Management Alternatives Identified in Metcalf & Eddy's Alternatives Development Methodology**

1. Treatment at existing wastewater treatment facilities (WWTFs), with discharge to existing surface-water discharge locations.
2. Treatment at existing WWTFs, with discharge at local individual land application sites* or at existing surface-water discharge locations.
3. Treatment at existing WWTFs, with conveyance to a regional facility for discharge to the Gulf of Maine.
4. Treatment at existing WWTFs, with conveyance to a regional discharge facility for land application.*
5. Collection of untreated wastewater from existing WWTFs, and conveyance to a regional facility for treatment and subsequent discharge to the Gulf of Maine.
6. Collection of untreated wastewater from existing WWTFs, and conveyance to a regional facility for treatment and subsequent discharge to a regional discharge facility(s) for land application.*
7. For core communities[a], treatment at existing WWTFs with regional discharge to the Gulf of Maine; for other communities, treatment at WWTFs with discharge either to existing surface water locations or to land application site.*
8. For core communities[a], treatment at existing WWTFs with regional land-application discharge; for other communities, treatment at existing WWTFs with discharge to either existing surface water location or land application site.*
9. For core communities[a], treatment at a regional WWTF with regional discharge to the Gulf of Maine; for other communities, treatment at existing WWTFs with discharge either to existing surface water location or land application site.*
10. For core communities[a], treatment at a regional WWTF with regional land discharge; for all other communities, treatment at existing WWTFs with discharge to either existing surface water locations or land application site.*

*The Alternatives Development Methodology states: "The general locations of land application sites for treated wastewater will be attempted to be identified in the alternatives development and analysis stage of the study. The reasonableness and favorability of these sites relative to the WWTF location and total estimated wastewater flow will be evaluated in light of the land application area available and volume of flow that area can accommodate."

[a]The Alternatives Development Methodology identifies the following as "core" communities: Dover, Durham, Exeter, Newfields and Newmarket. It also identifies Hampton as a core community, but only for ocean discharge alternatives. The Methodology identifies the following communities as "independent" (i.e., non-core): Epping, Farmington, Milton, Newington, Pease Development Authority, Peirce Island (Portsmouth), Rochester, Rockingham County, Rollinsford, Seabrook, and Somersworth. Hampton is classified as "independent" for land-discharge alternatives.

IV. MISSING PIECES

Advanced Decentralized Treatment

Throughout the wastewater management field, there is a growing recognition of the benefits and importance of innovative, decentralized treatment systems. Now questioning the past "conventional" wisdom that favored centralized wastewater systems, there are now in the United States "hundreds if not thousands of dedicated professionals, affiliated with organizations such as the National Decentralized Water Resources Capacity Development Project (a program Congress funds through the EPA), the National Small Flows Clearinghouse, the Consortium of Institutes for Decentralized Wastewater Treatment, and the National Onsite Wastewater Recycling Association work[ing] to make communities aware of the role decentralized systems can play. . . ."[53] Such systems, which can use innovative technologies at a variety of scales (lot, multi-lot, village) can have significant benefits, including protection of water quality, maintenance of natural hydrology at the subwatershed level and, with proper planning, promotion of smart-growth development.[54] As noted in one report: "wastewater facility planning as conventionally practiced is too narrow in scope. Too often it does not address the full range of implications of wastewater decisions, and too often it gives decentralized options inadequate consideration."[55]

Regrettably, Metcalf & Eddy's Alternatives Development Methodology has rejected decentralized wastewater technologies from further review. It did so on the ground that "[i]t would not be practical to separate the existing wastewater collection and treatment systems in the study area into a large number of cluster or satellite systems or into individual on-lot systems."[56] It further rejected decentralized wastewater management by stating: "While cluster, satellite, and on-lot systems should be considered for new growth areas in the study area communities, as conditions permit, they are not likely to be used in currently sewered areas. It should be noted that none of the study area communities indicated their desire to provide major sewer extension or the addition of sewer to an unsewered communitiy in the future."[57]

We agree that it would not be practical to convert existing wastewater treatment and collection systems into decentralized systems. However, we disagree with rejection of decentralized approaches for future development located in sewered areas. Moreover, it is an inescapable fact that new growth will occur in currently unsewered locations, and that regardless of current assumptions, there will be pressure in the future to extend sewer service to accommodate such growth. We believe innovative, decentralized wastewater technologies warrant detailed consideration as part of the region's solution for managing wastewater and growth, and that this technology should be included as part of the Study.

Pending Groundwater & Nutrient Studies

As previously discussed, two very important, highly relevant studies are currently underway in the Seacoast watershed: the groundwater sustainability study being conducted by the U.S. Geological Survey, and the Department of Environmental Services' development of nutrient criteria for New Hampshire's estuaries. Each of these studies will provide data that are fundamental to conducting a meaningful analysis of wastewater

management issues for the Seacoast. Although in the short-term it may slow the process of concluding this Study, we believe a viable analysis and final recommendation will be reached more efficiently with the important data that will result from these pending efforts.

The Maine Side of the Watershed

It appears that there has been little, if any, active involvement of communities from the Maine side of the estuary's watershed.

Developing a truly sustainable solution aimed at protecting the estuary and the Gulf of Maine requires consideration of the watershed as a whole. Approximately one-third of the Great Bay estuary's watershed lies within the State of Maine. The Study needs to affirmatively seek input and participation by stakeholders in Maine at the community, regional and state levels.

CONCLUSION

This Study, and the decisions that will result from it, will greatly affect the future health and sustainability of the Great Bay estuary, the Gulf of Maine, and the numerous communities within the New Hampshire Seacoast watershed. As outlined above, it is imperative that regional wastewater management issues be viewed within a broad context that includes the significant values and sensitivities of the estuary, the Gulf of Maine, and the numerous species that depend on them, as well as intense growth and development in the Seacoast region.

Viewing the issue of regional wastewater management in its proper, broad context, the outcome of this Study must ensure a wastewater management approach that meets three Essential Criteria:

1. Protection and enhancement of the Great Bay estuary through (a) the protection of water quality and (b) the protection of the natural hydrology of the estuary and the rivers that flow into it;
2. Protection of the Gulf of Maine; and
3. Promotion of sustainable development patterns as opposed to low-density sprawl.

Applying these criteria, CLF and TNC believe the remaining limited resources for this Study should be devoted to the following alternatives:

- The use of existing WWTFs (Alternatives 1 and 2) with upgraded treatment technology to protect the estuary, and with detailed planning to support sustainable, compact growth and discourage sprawl;
- The smaller-scale regional land-application scenario using a subgroup of existing WWTFs (Alternative 8), with treatment sufficient to protect groundwater resources, detailed consideration of hydrologic impacts to freshwater and estuarine species, and detailed planning to support sustainable, compact growth and discourage sprawl; and
- Decentralized wastewater treatment approaches in combination with the above alternatives.

It is our further position that regional ocean outfall alternatives (Alternatives 3, 5, 7 and 9) fail to meet the Essential Criteria and should be rejected from further consideration, as should three of the four regional land-application-discharge alternatives (Alternatives 4, 6 and 10).

In addition to the above, it is important to recognize that, through an iterative process aimed at meeting the three Essential Criteria there may be another alternative not yet identified by Metcalf & Eddy that is worthy of detailed consideration.

Finally, it is important to note that there are critical missing pieces that need to be incorporated into the Study. They include: detailed consideration of decentralized wastewater management approaches as a part of the solution; inclusion of important data from pending efforts to study the sustainability of groundwater in the Seacoast, and to establish nutrient criteria for New Hampshire's estuaries; and consideration of issues pertaining to the Maine side of the watershed, including active involvement of Maine stakeholders at the community, regional, and state levels.

TNC and CLF view this Study as a timely opportunity to engage in important regional planning aimed at protecting the Great Bay Estuary and Gulf of Maine, and promoting a

more sustainable Seacoast region as intense growth trends continue. Communities throughout the Seacoast region are currently struggling with hard decisions about how to both manage this growth and preserve their quality of life. We believe that all communities deserve an opportunity to participate in a well informed discussion about the intended and unintended consequences of different regional wastewater treatment options. We look forward to constructive dialogue with the Great Bay Estuary Commission and all stakeholders as this important Study proceeds.

CITATIONS

[1] Senate Bill 70 states that the Commission shall study, among other things, "[t]he feasibility of implementing a recommendation of the estuaries project management plan that the discharge from area wastewater treatment plants be combined for discharge in the Atlantic Ocean." It is important to note that, despite Senate Bill 70's statement to the contrary, the New Hampshire Estuaries Project's Management Plan does ***not*** recommend that the discharge from area wastewater treatment plants be combined and discharged to the ocean.

[4] *N.H. Estuaries Project Management Plan* at 2-18 (2000).

[5] Senate Bill 70.

[6] New Hampshire Department of Environmental Services, Shellfish Program. Open/Closed Areas. http://www.des.state.nh.us/wmb/shellfish/openclosed.htm. Accessed March 1, 2006.

[7] *Developing Impervious Surface Estimates for Coastal New Hampshire*: A final report submitted to the New Hampshire Estuaries Project by David Justice and Fay Rubin. Complex Systems Research Center, University of New Hampshire. 2002.

[8] Society for the Protection of New Hampshire Forests, *New Hampshire's Changing Landscape* (2005).

[9] Deacon, J.R., Soule, S.A., and Smith, T.E., 2005, *Effects of urbanization on stream quality at selected sites in the Seacoast region in New Hampshire*, 2001-03: U.S. Geological Survey Scientific Investigations Report 2005-5103,

[10] New Hampshire Department of Environmental Services. Watershed Management Bureau. Final 2004 305(b) and 303(d) Surface Water Quality Report.

[11] New Hampshire Estuaries Project. *State of the Estuaries Report* (2003).

[12] Written communication from Frederick T. Short, Ph.D. to Thomas F. Irwin, CLF. Dr. Short is a Research Professor at the Jackson Estuarine Laboratory, Univ. of New Hampshire

[13] Valiela, I., J. McClelland, J. Hauxwell, P.J. Behr, D. Hersh, and K. Foreman. 1997. *Macroalgal blooms in shallow estuaries: Controls and ecophysiological and ecosystem consequences.* Limnology and Oceanography 42: 1105-1118.

[14] Pew Oceans Commission. 2003. *America's Living Oceans: Charting a Course for Sea Change. A Report to the Nation.* Arlington, Virginia.; U.S. Commission on Ocean Policy. 2004. *An Ocean Blueprint for the 21st Century: Final Report of the U.S. Commission on Ocean Policy.* U.S. Commission on Ocean Policy, Washington, D.C.

[15] Society for the Protection of New Hampshire Forests, *New Hampshire's Changing Landscape* (2005). As compared to New Hampshire's 17.2% growth in population, other New England states experienced population growth during the same period as follows: Maine, 7.3%; Vermont, 10.4%; Massachusetts, 6.7%; Connecticut, 6.7%; Rhode Island, 7.7%. *Id.*

[16] *Id.*

[17] *Id.*

[18] *See An Ocean Blueprint for the 21st Century: Final Report of the U.S. Commission on Ocean Policy.* U.S. Commission on Ocean Policy, p. 150

[19] *See* N.H. Estuaries Project. *State of the Estuaries Report* (2003), p. 26.

[20] *Preliminary Findings Report*, Metcalf & Eddy, pp. 2-15 to 2-16.

[21] *Developing Impervious Surface Estimates for Coastal New Hampshire*: A final report submitted to the New Hampshire Estuaries Project by David Justice and Fay Rubin. Complex Systems Research Center, University of New Hampshire. 2002.

[22] N.H. Estuaries Project, *State of the Estuaries Report*, p. 26. *See also* N.H. Estuaries Project *Management Plan* (2000) at 3-1 ("The greatest environmental risks to the estuaries are from population growth and development, which can have significant impacts on water quality and living resources, and can result in loss and fragmentation of habitat and open space.").

[23] *Preliminary Findings Report*, Metcalf & Eddy, p. 2-16 (noting that sprawl development patterns "can also result in higher per capita expenditures for municipal services due to the need for additional municipal facilities and improvements to infrastructure to accommodate the decentralized growth.") (citing NHOEP, 2003).

[24] *Id.*

[25] *Civic Participation and Smart Growth: Transforming Sprawl into a Broader Sense of Citizenship*, Funders' Network for Smart Growth and Livable Communities, Translation Paper No. 4 (Nov. 2000).

[26] As stated in comments submitted to Metcalf & Eddy by letter dated July 27, 2005, we are very concerned that assumptions developed as the basis for this Study "reveal an approach that is not ambitious enough in enhancing the sustainability of the Gulf of Maine, the Great Bay estuary, and rivers within the estuary's watershed, and that, should they be adopted, the study will result in a lost opportunity to truly protect these important natural resources." Joint Comments of CLF, TNC and N.H. Rivers Council, p. 2 (July 27, 2005). As further stated in those comments, we also are very concerned with the

cumulative impacts that will result from future growth and development. *Id.*

[27] Joint Comments of CLF, TNC and the N.H. Rivers Council, p. 3 (July 27, 2005).

[28] Natural Resources Defense Council, Environmental Integrity Project, *Swimming in Sewage* (2004) at pp. 6-15.

[29] *Drugs leaking into waterways bad news for fish*, Gulf of Maine Times, p. 4 (Winter 2005)

[30] "Wastewater blending" refers to a process used during wet-weather, high-flow events in which a portion of a plant's wastewater flow is diverted around (i.e. not subjected to) biological treatment processes, and is then recombined with the rest of the treated wastewater flow for chemical disinfection. The subject of wastewater blending received much attention last year, when the Environmental Protection Agency proposed relaxing its regulations to make blending a standard treatment option. The EPA has abandoned this proposal.

[31] *Goodbye to Tea in Boston*, Robert Zimmerman, Jr., Charles Watershed Association, http://www.crwa.org/articles/goodbyetotea.html (noting that of the 380 million gallons per day (mgd) of "wastewater" treated at the Deer Island plant, 180 mgd is groundwater that infiltrates into the wastewater collection system.

[32] *See* http://nh.water.usgs.gov/projects/seacoast/index.htm

[33] N.H. Estuaries Project, *State of the Estuaries Report* (2003) p. 12.

[34] *Id.*

[35] N.H. Estuaries Project *Environmental Indicator Report: Shellfish* (Sept. 27, 2002) p. 32.

[36] *Mechanisms for migration of anadromous herring: An ecological basis for effective conservation*, Yako, L.A., M.E. Mather, and F. Juanes. 2002. Ecological Applications 12: 521-534; *Processes Contributing to Variability in Regional Patterns of Juvenile River Herring Abundance Across Small Coastal Systems*, Kosa, Jarrad T. and Martha E. Mather. Transactions of the American Fisheries Society 130:600-619, 2001.

[37] *See Red tide continues to spread down coast*, Portsmouth Herald (June 3, 2005), http://www.seacoastonline.com/news/06032005/south_of/45636.htm; *Red tide's damage spreads*, Cape Cod Times (June 3, 2005), http://www.capecodonline.com/cctimes/redtidexs2.htm; *Red tide threatens seabirds, whales*, Cape Cod Times (June 1, 2005), http://www.capecodonline.com/cctimes/redtide1.htm.

[38] *Final Methodology for Development of Future WWTF Discharge Limits*, Metcalf & Eddy, Wright-Pierce (Aug. 2, 2005).

[39] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) (prepared by the Rocky Mountain Institute for the U.S. Environmental Protection Agency) p. 43. *See also Creative Community Design and Wastewater Management*, National Decentralized Water Resources Capacity Development Project (NDWRCDP) Research Project, Final Report, 2004, p. 1-2 (noting the "loss of control over land use that so often accompanies availability of sewers."), p. 1-11 ("Sewers also bring additional pressure for growth that may be inconsistent with local plans.").

[40] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) pp. 42-43. As this report notes: "Sewers attract growth, for better or worse, for at least three reasons: available capacity because high fixed costs require sewers to be oversized relative to existing development; regulations that often require connection in order to develop; and increased returns on investment since sewered land can be developed more densely." *Id.* at 42 (citing Burby *et al.* 1988, p. 120-121).

[41] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. 42 ("By allowing increased density, sewers contribute to the water quality impacts of development. For example, on the barrier islands of North Carolina, sewers constructed to address failing septic systems have allowed greater development density and development in marginal areas. The resulting stormwater runoff has further degraded coastal water quality.").

[42] *Creative Community Design and Wastewater Management*, National Decentralized Water Resources Capacity Development Project (NDWRCDP) Research Project, Final Report, 2004, p. 1-1.

[43] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. 42. *See also* Lampton, Kate, *Developing a Sewer Ordinance: One Town's Experience*, Planning Commissioners Journal, No. 44 (Fall 2001).

[44] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. 42. *See also Sewage Facilities and Land Development*, 10,000 Friends of Pennsylvania (Oct. 2005) ("Public sewers and community on-lot systems . . . can support high intensity uses and may be used in designated growth areas where dense development

is appropriate. Used heedlessly, however, the availability of public and community facilities has the potential to be a catalyst for unplanned growth or allow development to leapfrog outward and promote sprawling patterns instead.") (Exec. Summary, p. 3)

[45] *Creative Community Design and Wastewater Management*, National Decentralized Water Resources Capacity Development Project (NDWRCDP) Research Project, Final Report, 2004, p. 1-11.

[46] RSA 9-B:2. *See also* RSA Chapter 9-B generally.

[47] DES Growth Management/Sprawl Policy, NHDES Guidebook for Environmental Permits in New Hampshire (2002 ed.) at 447.

[48] *Alternatives Development Methodology*, Metcalf & Eddy, p. 4.

[49] N.H. Estuaries Project *Management Plan* 2000, Table 2.4

[50] *Final Methodology for Development of Future WWTF Discharge Limits*, Metcalf & Eddy and Wright-Pierce (Aug. 2, 2005).

[51] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. 47.

[52] *Creative Community Design and Wastewater Management*, National Decentralized Water Resources Capacity Development Project (NDWRCDP) Research Project, Final Report, 2004, p. 1-11.

[53] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. 2.

[54] *Id. See also Creative Community Design and Wastewater Management*, National Decentralized Water Resources Capacity Development Project (NDWRCDP) Research Project, Final Report, 2004.

[55] Pinkham, Richard D. *et al.*, *Valuing Decentralized Wastewater Technologies: A Catalog of Benefits, Costs, and Economic Analysis Techniques* (2004) p. xxi.

[56] *Alternatives Development Methodology*, Metcalf & Eddy, p. 6-7.

[57] *Id. at 7.*

Conservation Law Foundation
New Hampshire Rivers Council
The Nature Conservancy, New Hampshire Chapter

February 21, 2008

Via Electronic Mail (maggie.hassan@leg.state.nh.us)
The Honorable Maggie Hassan, Chair
Great Bay Estuary Commission
N.H. State House, Room 302
107 North Main Street
Concord, NH 03301

Via Electronic Mail (stephen.roberts@des.nh.gov)
Mr. Stephen Roberts
N.H. Department of Environmental Services
29 Hazen Drive, P.O. Box 95
Concord, NH 03301

Re: Report of the Great Bay Estuary Commission

Dear Senator Hassan and Mr. Roberts:

Pursuant to the procedures discussed at the February 1, 2008 meeting of the Great Bay Estuary Commission ("Commission"), we are writing to provide comments for the Commission's consideration in its development of a final report to the legislature.

As you know, the question arose during the Commission's February 1 meeting as to whether the Commission should convey a position in its final report regarding the concept of a regional wastewater treatment outfall, identified in Metcalf & Eddy's Draft Alternatives Report (Nov. 2007) ("M&E Report") as Alternative 2. As evidenced during the planning charrette, this alternative has generated substantial concern among the public. It also has generated substantial concern by commercial and recreational fisherman, and by our respective organizations. Conservation Law Foundation and The Nature Conservancy outlined many of these concerns in detail in its joint paper "Toward a Healthy Great Bay Estuary and a Sustainable Seacoast: A New Framework for Sewage Wastewater Management and Planning in New Hampshire's Coastal Watershed," published in March 2006 near the time of the charrette (appended hereto for your convenience).

The M&E Report (which we understand to be near completion, pending comments or questions from Commission members), recognizes significant shortcomings of Alternative 2. As discussed in that report, Alternative 2 is significantly more costly than the other alternatives, and it is acknowledged that it could:

- cause secondary growth and development;
- result in the reduction of surface water flow, and potentially groundwater, downstream of some wastewater treatment plants, with potential adverse impacts on water supply, coastal vegetation, and aquatic habitat;
- increase cumulative contributions of nitrogen and other wastewater pollutants in the Gulf of Maine;
- increase salinity in the estuary as a result of decreased flows to rivers;
- cause changes in wetland and terrestrial habitat in the Great Bay receiving waters, including reduced wetlands acreage;
- adversely affect aquatic resources in the estuary by reducing base flows to Great Bay receiving waters, and in the Gulf of Maine by potentially causing exceedances of chronic values for certain highly sensitive saltwater species at two of the candidate outfall locations; and
- alter habitat for rare and endangered species in Great Bay as a result of changes to hydrology.

M&E Report, Section 9. The report also identifies Alternative 2 as the most complex and difficult-to-implement alternative. *Id.*

It is important to note that certain important adverse impacts of Alternative 2 are *not* addressed in detail in the M&E Report. For example, the report does not address in great detail the secondary impacts to biological communities that would result from Alternative 2. Such impacts could include: higher rates of disease among fragile oyster populations, caused by higher salinity levels resulting from the diversion of treated freshwater out of the estuary; changes to the dynamics and distribution of salt and brackish marshes caused by higher salinities in the estuary; and impacts to benthic and pelagic communities in the Gulf of Maine, including increased incidence of red tide, caused by the concentration of nutrients there.

The M&E Report, and adverse impacts of a regional outfall not addressed in great detail in that report, provide good reason to disfavor Alternative 2. The Commission has spent a great deal of time and effort studying alternative approaches to planning wastewater treatment on a regional basis. We commend the Commission for those efforts, and urge the Commission to recommend that based on the analysis of the M&E Report, and other concerns, Alternative 2 is the least favorable of all options and does not warrant further consideration.

Although we understand that the Commission's recommendation will not be binding on the Estuary Alliance for Sewage Treatment, or on any other body, we nonetheless believe the Commission has, through its efforts, earned the right to offer an opinion on the matter, and that the evidence overwhelmingly disfavors Alternative 2 and warrants a Commission recommendation that it not be pursued.

Conservation Law Foundation, New Hampshire Rivers Council, and The Nature Conservancy, New Hampshire Chapter, appreciate the opportunity to provide these comments. Should you have any questions, please do not hesitate to contact us.

Respectfully submitted,

Conservation Law Foundation

By: /s Thomas F. Irwin
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New Hampshire Rivers Council

By: /s Carl Paulsen
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The Nature Conservancy, New Hampshire Chapter

By: Ray Konisky
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SHOALS MARINE LABORATORY
CORNELL UNIVERSITY | UNIVERSITY OF NEW HAMPSHIRE

20 March 2008

The Honorable Maggie Hassan, Chair
Great Bay Estuary Commission
N.H. State House, Room 302
107 N. Main St.
Concord, NH 03301
Via email: (*maggie.hassan@leg.state.nh.us*)

Re: Report of the Great Bay Estuary Commission

Dear Senator Hassan:

The Shoals Marine Laboratory is a seasonal field station on Appledore Island in the Gulf of Maine that is operated jointly by Cornell University and the University of New Hampshire. The laboratory is dedicated to undergraduate education and research in the marine sciences.

We would like to voice significant concerns over Alternative Two of the draft Metcalf and Eddy feasibility study that discusses a Gulf of Maine discharge for regional wastewater in the area of Great Bay. We note that this alternative is expected to be significantly more costly than other alternatives.

Further, we also note that the M&E draft report identifies significant potential ecological impacts that could be created by this alternative, such as:

a) increased cumulative contributions of nitrogen and other wastewater pollutants in the Gulf of Maine, particularly in close proximity to Appledore Island,
b) reduced surface flows, and potentially groundwater, downstream of some wastewater treatment plants, with potential adverse ecological impacts,
c) increased salinity in the estuary due to diminished river flows,
d) alterations in wetland and terrestrial habitats, and reduce wetlands acreage, in Great Bay,
e) adverse effects on aquatic resources in the Great Bay estuary and Gulf of Maine through reduced base flows in Great Bay,
f) altered habitat for rare and ESA listed species in Great Bay as a result of hydrographic changes, and
g) potential for unsustainable secondary growth and development.

SHOALS MARINE LABORATORY
CORNELL UNIVERSITY | UNIVERSITY OF NEW HAMPSHIRE

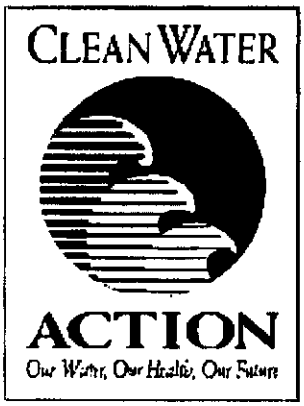
The Metcalf and Eddy draft report does not adequately address these ecological impacts of a Gulf of Maine outfall in either qualitative or quantitative fashions. The Shoals Marine Laboratory is highly dependent on clean ocean waters and natural ecological communities and processes to meet its educational mission. Because of the high estimated costs and the identified ecological risks, we recommend that this alternative be dropped from further consideration by the Great Bay Estuary Commission.

Thank you for your consideration of our concerns.

Sincerely,

Hal Weeks, Ph.D.
Assistant Director for Island and Coastal Programs

c. G. Ritchie White, Coastal Conservation Association of N.H.



CLEAN WATER ACTION

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May 15, 2008

Hon. Senator Maggie Hassan, Chair
Great Bay Estuary Commission
General Court
Concord , New Hampshire

Dear Senator Hassan and Members of the Commission,

On behalf of our members throughout the Seacoast region, we appreciate the opportunity to comment on the final report and recommendations of the Great Bay Estuary Commission. We would like to congratulate the Commission for its fine work in steering a careful and balanced course through the "troubled waters" of determining future wastewater management options for the region. The discussion has certainly come a long way from its more narrowly-focused, grand scheme inception, and the cautious approach taken in the final recommendations is appropriate in consideration of the debate that has occurred over the life of the Commission.

That said, we are concerned over a missed opportunity reflected in the report to help provide a broader vision of the scope of action needed to address future wastewater management. If anything, the foregoing discussion has helped define the limits of increasing centralization and "hard engineering" of our wastewater problems, yet there is no recognition in the report that we are rapidly approaching a historic juncture, where new directions must be pursued if we are to have a chance in designing a sustainable water infrastructure for the new century. The overarching problem of providing for a growing population while upgrading aging, overburdened and environmentally unsound facilities in the region was certainly recognized by participants in the project's inception, but this context and onus seems to have gotten lost or at least downplayed in the final analysis. Perhaps an outline of the solution is beyond the scope of the existing Commission, but it will not serve the region's municipalities well to simply pass on the challenge of how best to address the problems at hand.

This is not simply a matter of choosing or prioritizing the best of the four options presented in the *Alternatives Report*. Clearly, each municipality will have to determine what combinations of technologies and techniques might work best for their specific conditions and needs. What we

look for is some acknowledgement and guidance that we may not be able to solve our wastewater problems with the same – only bigger – tools that got us into the current situation. Whether we all recognize it or not, we are approaching a turning point in how we are able to manage our water and other resources, and neglecting or deferring that awareness and timely action will not serve future generations well.

We also regret that there were not enough resources available to the project in the end for more public outreach and discussion of the alternatives presented. If any of these alternatives are to be pursued in a forthright way, it is vitally important that the general public accept and support the approaches eventually taken. In light of the cost estimates presented in the *Alternatives Report*, especially when put in the context of the findings of another recently concluded Commission to Study the Treatment Plant Needs of New Hampshire (HB 1491, 2006), public support of all kinds will be needed to see the projects through.

We hope that the completion of this project will nevertheless spur further discussion of how to move forward and build the sustainable water infrastructure that we truly need for the future. We welcome continued collaboration with Commission participants in pursuit of this goal, and I thank you again for the opportunity to submit these comments.

Sincerely,

Doug Bogen
New Hampshire Program Director
Clean Water Action

Voting Sheets

HOUSE COMMITTEE ON RESOURCES, RECREATION AND DEVELOPMENT

EXECUTIVE SESSION on SB 70

BILL TITLE: **(New Title) establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.**

DATE: May 20, 2003

LOB ROOM: 305

Amendments:

Sponsor: Rep. Royce	OLS Document #:	2003	1544h
Sponsor: Rep.	OLS Document #:		
Sponsor: Rep.	OLS Document #:		

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. Lawton

Seconded by Rep. Fields

Vote: 13-0 (Please attach record of roll call vote.)

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. Lawton

Seconded by Rep. Fields

Vote: 11-2 (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE:

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. David H. Russell, Clerk

HOUSE COMMITTEE ON RESOURCES, RECREATION AND DEVELOPMENT

EXECUTIVE SESSION on SB 70

BILL TITLE: **(New Title) establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.**

DATE: 5/20/03

LOB ROOM: 305

Amendments:

Sponsor: Rep. ROYCE — OLS Document #: 2003-1544

Sponsor: Rep. — OLS Document #:

Sponsor: Rep. — OLS Document #:

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. LAWTON

Seconded by Rep. FIELDS

Vote: 13-0 (Please attach record of roll call vote.)

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. LAWTON

Seconded by Rep. FIELDS

Vote: 11-2 (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE: REG. CAL

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. David H. Russell, Clerk

Roland Ouwy

RESOURCES, RECREATION AND DEVELOPMENT

Bill #: SB 70 Title: ESTABLISHING A COMMISSION ON ESTUARIES

PH Date: ___/___/___ Exec Session Date: 5/20/03

Motion: AMENDMENT Amendment #: 2003-1544h

MEMBER	YEAS	NAYS
Royce. H Charles. Chairman	X	
Lawton. David M. V Chairman	X	
Cooney. Richard T	X	
Fields. Dennis H	X	
Russell. David H		
Bruno. Pierre W	X	
Christensen. D L Chris	X	
Akins. Ralph L		
Camm. Kevin L		
Ruffner. Walter D	X	
Cail. Kenneth B	X	
Campbell. W Packy	X	
Laflamme. Charles F		
Merrow. Harry C	X	
Wiley. Robert W		
Spang. Judith T		
Donovan. Thomas E		
McEachern. Paul		
Blevler. Ruth Z	X	
Brueggemann. Donald A	X	
Parkhurst. Henry A L	X	

TOTAL VOTE: 13-0

Printed: 1/6/2003

OFFICE OF THE HOUSE CLERK 2003 SESSION

RESOURCES, RECREATION AND DEVELOPMENT

Bill #: SB 70 **Title:** ESTABLISHING A COMMISSION ON ESTUARIES PROJECT

PH Date: ___/___/___ **Exec Session Date:** 5/20/03

Motion: OTP/A **Amendment #:** 2003-1544h

MEMBER	YEAS	NAYS
Royce. H Charles. Chairman	X	
Lawton. David M. V Chairman	X	
Cooney. Richard T	X	
Fields. Dennis H	X	
Russell. David H		
Bruno. Pierre W		X
Christensen. D L Chris		X
Akins. Ralph L		
Camm. Kevin L		
Ruffner. Walter D	X	
Cail. Kenneth B	X	
Campbell. W Packy	X	
Laflamme. Charles F		
Merrow. Harry C	X	
Wiley. Robert W		
Spang. Judith T		
Donovan. Thomas E		
McEachern. Paul		
Blevler. Ruth Z	X	
Brueggemann. Donald A	X	
Parkhurst. Henry A L	X	

TOTAL VOTE: 11-2

Printed: 1/6/2003

Committee Report

COMMITTEE REPORT

COMMITTEE: **Resources, Recreation and Development**

BILL NUMBER: **SB 70**

TITLE: (New Title) establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan.

DATE: May 20, 2003 CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

This legislation will establish a commission to study regional problems relating to wastewater disposal in the Great Bay estuary area. Among the duties of this commission will be to examine the feasibility of combining the wastewater discharge of multiple communities and ways to dispose of it in the least environmentally impacting method. Regional cooperation among the communities will be explored as will other potential partnerships to help to fund the restoration of the Great Bay estuary habitat. The committee amendment adds the Executive Director of the New Hampshire Fish and Game Department or his/her designee to the proposed commission. The original $1,000,000 appropriation in this bill was removed by the Senate.

Vote 11-2.

Rep. David M. Lawton
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

Resources, Recreation and Development

SB 70, (New Title) establishing a commission to study implementing a recommendation of the New Hampshire estuaries project management plan. **OUGHT TO PASS WITH AMENDMENT**

Rep. David M. Lawton for Resources, Recreation and Development: This legislation will establish a commission to study regional problems relating to wastewater disposal in the Great Bay estuary area. Among the duties of this commission will be to examine the feasibility of combining the wastewater discharge of multiple communities and ways to dispose of it in the least environmentally impacting method. Regional cooperation among the communities will be explored as will other potential partnerships to help to fund the restoration of the Great Bay estuary habitat. The committee amendment adds the Executive Director of the New Hampshire Fish and Game Department or his/her designee to the proposed commission. The original $1,000,000 appropriation in this bill was removed by the Senate. **Vote 11-2.**

RESOURCES, RECREATION & DEVELOPMENT COMMITTEE

ROOM 305

TUESDAY, MAY 20, 2003

11:00 a.m. **EXECUTIVE SESSION ON PENDING LEGISLATION**

SB 70

This legislation will establish a commission to study regional problems relating to ~~municipal~~ wastewater ~~discharge~~ disposal in the Great Bay Estuary area.

Among the duties of this commission will be to examine the feasibility of combining the wastewater discharge of multiple ~~sites~~ communities ~~at the least~~ and ways to dispose ~~of~~ of it in the least environmentally impacting method. Regional cooperation among the communities will be explored as will ~~possible~~ other potential partnerships to help ~~achieve~~ to fund the restoration of the Great Bay estuary habitat.

- The committee amendment adds the Executive Director or his/her designee of the N.H. Fish + Game Department or his/her designee to the proposed commission.

- The original $1,000,000 appropriation in this bill was removed by the Senate.

David M Lamb