
REGIONAL DREDGING MANAGEMENT PLAN FINAL REPORT

Prepared for the:

Town of Greece (Lead)
Town of Sandy Creek
Village of Sodus Point
City of Oswego
Monroe County
Wayne County
Oswego County

and the:

New York State Department of State
Division of Coastal Resources

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A. Introduction and Summary of Recommendations

This Regional Dredging Management Plan has been developed to provide a comprehensive approach to the on-going dredging needs for harbor access channels along the south shore of Lake Ontario. It has been developed under the direction of and in cooperation with the Town of Greece, Monroe County, the Village of Sodus Point, Wayne County, the City of Oswego, the Town of Sandy Creek, Oswego County and the Division of Coastal Resources of the New York State Department of State. The Town of Greece administered the Plan development. Funding for the development of this Plan has been provided by the participating communities and the New York State Department of State.

The Plan addresses several issues related to dredging and presents potential solutions. This includes the identification of dredging needs; the costs and potential funding mechanism for dredging projects; the feasibility, nature and form of intermunicipal cooperation; a methodology and process for determining dredging priorities and scheduling; the feasibility and requirements for expedited permitting; and alternatives for ownership, control and operation of dredging equipment.

The primary focus of the investigation is on the harbors and channels in the three participating Counties. However, the solutions developed should be applicable and transferable to all lakeshore communities.

Section B of this report details dredging needs in the participating counties and expected economic benefits of a consistent, dependable dredging operation. Section C outlines organizational and program management options available for program implementation. Dredging priorities and scheduling are discussed in Section D and Section E contains recommendations on suitable dredging equipment necessary to carry out the program. Section F discusses dredge spoil management including the potential for beneficial use of non-toxic dredged materials and Section G discusses permitting for the dredging operations.

Finally, Section H contains cost estimates and an evaluation of funding options for the program.

Based upon all the factors considered, the following recommendations are offered.

1. It is recommended that the participating communities encourage State legislative action to create a new State authority charged with the responsibility for the implementation and operation of the Regional Dredging Management Plan. This new entity would schedule all work, obtain and maintain all required permits and either perform the dredging itself and/or contract with private entities for such work. If formation of a new authority proves infeasible, it is recommended that a new unit be established under an existing authority, most likely the Oswego Port Authority, the Rochester-Genesee Regional Transportation Authority, the Central New York Transportation Authority, or the NYS Environmental Facilities Corporation. The managing entity, if conducting the dredging operations itself, should have the legal ability to contract for dredging in interior harbor channels and feeder creeks not covered by the basic plan structure, if such additional dredging is separately funded by private entities or local governments.
2. Annual cost for the implementation of the Dredging Management Plan is estimated at approximately \$325,000, with approximately \$225,000 of this for operations and the remainder for capital equipment. This is based upon the following dredging schedule and annual amounts.

Sites	Annual Amount (cu yd)
Braddock Bay, Sandy Pond, Long Pond Outlet	~15,000 / year (Each site once per year.)
Sandy Creek, Pultneyville	~ 1,000/year (Each site every other year.)
East Bay, Port Bay, Blind Sodus Bay	~ 1,500 / year (Each site once per year.)
Irondequoit Bay, Sodus Bay,	~ 15,000 / year (One site per

Mexico Point, Salmon River, Bear Creek Harbor	year on a rotating basis.)
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After reviewing a number of funding options, a mix of county, State and Federal funding, along with a boating user fee, is recommended as follows:

Recommended Funding By Source	
	<u>Annual</u>
Monroe County	\$37,500
Wayne County	\$37,500
Oswego County	\$37,500
Federal/State (Capital Equipment)	100,000
Boat Registration Add-On Fee	\$112,500
Totals	\$325,000

As shown, the funding includes a boat registration add-on fee to be administered in a manner similar to the current snowmobile registration add-on. The fee would apply to those boats registered in the Counties participating in the dredging program and would be structured as follows to raise the necessary funds:

Annual Add-on Fee By Vessel Size			
Boat Size	< 16'	16' to 25'	> 25'
Annual Add-On Fee (Approximate)	\$1.40	\$2.80	\$4.67

- It is likely that the organization responsible for implementation and operation of the Regional Dredging Management Plan will eventually own and operate dredging equipment to accomplish the plan goals. It has been found in other jurisdictions that ownership and operation of equipment is less costly than contracting for dredging services. In addition, the most suitable type of dredging equipment is not presently available for hire in the Lake Ontario shoreline area. The recommended equipment consists of a ten or twelve inch, portable hydraulic dredge and necessary supporting equipment suitable for pumping sediment a minimum of 3,000 feet. A number or

manufacturers can supply the necessary unit and there is the possibility of obtaining a used unit with relatively low operating hours.

An alternative approach is for the funding entity to offer a long term dredging contract to the private sector, with specific equipment, dredging volumes and disposal requirements. The funding entity would likely still maintain responsibility for scheduling dredging and for obtaining all necessary permits.

4. It is recommended that almost all of the spoils generated by the Regional Dredging Plan be beneficially utilized for beach nourishment and erosion protection at nearby shoreline sites. No other economically viable beneficial uses for the material were identified. Some land or off-shore disposal may be necessary to meet particular needs, but this should represent, at most, ten to twenty percent of the annual dredged volume.

It is believed that implementation of these recommendations will assure timely and adequate maintenance dredging of Lake Ontario access channels. This will allow for the continuing economic activity associated with use of these waterways and, more importantly, promote the further economic development of the Lake Ontario shoreline resources.

B. Dredging Needs and Economic Impacts

The first step in the Plan development is the identification of dredging needs. In support of this, all harbor access channels to Lake Ontario in Monroe, Wayne, Cayuga and Oswego Counties have been identified and background information on each collected. The background information was derived from several published sources; site visits; interviews with public officials, marina operators, yacht clubs and marine contractors; review of selected Town and County files; and a review of NYS DEC and US Army Corps of Engineers regulatory permit files. Emphasis was placed upon those items of relevance in determining dredging needs and operational requirements. This includes the channel physical configuration and protection, the type and level of use, size of vessels, sediment physical characteristics and chemical quality, and past dredging experience including sponsoring entity, frequency, amounts, and disposal.

It is noted that internal channels within harbors, including those leading into feeder creeks and streams, are not included as part of the Regional Dredging Management Plan. This is due to the overwhelming number of such channels, the unique characteristics and needs of each, and the fact that dredging such channels would only benefit a small, identifiable number of private docks and/or individual marinas in each case. In contrast, maintenance of the larger connecting channels to Lake Ontario is expected to provide benefits to a large number of private docks, public launches and/or several marinas for each identified channel. Given these factors, the participating communities decided at project commencement to only include the access channels leading from Lake Ontario into harbors as part of the Regional Dredging Management Plan. As discussed in a later section, the secondary internal channels may be dredged, with private or local public funding, by contract with the entity created to implement the Regional Plan, depending upon the exact organizational and institutional form adopted. Otherwise, the internal channels can be maintained, again with private local government or private funding, through private contracting, as is done under present circumstances.

A total of seventeen harbor access channels were identified over the approximately 100 linear miles of Lake Ontario shoreline in the four counties (Monroe, Wayne, Cayuga and Oswego). These were each assigned a site number, commencing with one for the westernmost and progressing eastward. A listing of each channel, is as follows:

Site	Channel / Waterbody Designation	Municipality	County
1	Sandy Creek	Hamlin (T)	Monroe
2	Braddock Bay	Greece (T)	Monroe
3	Long Pond Inlet	Greece (T)	Monroe
4	Genesee River	Rochester (C)	Monroe
5	Irondequoit Bay	Irondequoit (T), Webster (T), Penfield (T)	Monroe
6	Bear Creek Harbor	Ontario (T)	Wayne
7	Pultneyville	Pultneyville (V), Williamson (T)	Wayne
8	Fairbanks Pt. - Hughes Marina	Williamson (T)	Wayne
9	Sodus Bay	Sodus Point (V), Sodus (T), Huron (T)	Wayne
10	East Bay	Huron (T)	Wayne
11	Port Bay	Huron (T), Wolcott (T)	Wayne
12	Blind Sodus Bay	Wolcott (T)	Wayne
13	Little Sodus Bay	Sterling (T), Fairhaven (V)	Cayuga
14	Oswego Harbor	Oswego (C)	Oswego
15	Mexico Pt. - Little Salmon River	Mexico (T)	Oswego
16	Salmon River - Port Ontario	Richland (T)	Oswego
17	Sandy Pond Inlet	Sandy Creek (T)	Oswego

Relevant information for each channel was organized into a database. The resulting inventory database is contained in Appendix A.

Based upon the collected information, the channels were grouped into five classes based upon the type of sediment present and the degree of current channel stabilization. The five classes are defined as follows:

Class	Properties
I	Unstabilized outlet, sand substrate.
II	Minimum stabilization consisting of partial jetties; sand substrate.
III	Minimum stabilization consisting of partial jetties; coarse gravel, stone and cobble substrate.
IV	Stabilized Federal Project; primarily sand substrate with some silts; irregular Federal maintenance.
V	Stabilized Federal Projects; Regularly maintained by the US Army Corps of Engineers for commercial traffic.

The channel sites, organized by class, with a brief description of their sediments and the amount of dredging required are as follows:

Class	Sites	Material/Disposal	Annual Amount (cu yd)
I	Braddock Bay, Sandy Pond, Long Pond Outlet	Sands; presumed clean based on location and past experience; should be suitable for adjacent shoreline beach nourishment or other beneficial uses.	~15,000 / year (Each site once per year.)
II	Sandy Creek, Pultneyville	Sands; should be clean, but have been disposed at upland sites in the past; may be suited for beneficial use including shoreline nourishment.	~ 1,000/year (Each site every other year.)
III	East Bay, Port Bay, Blind Sodus Bay	Coarse gravel, stone & cobble; clean; should be suitable for adjacent shoreline stabilization, sale for building product, or other beneficial use.	~ 1,500 / year (Each site once per year.)
IV	Irondequoit Bay, Sodus Bay, Little Sodus Bay, Mexico Point, Salmon River, Bear Creek Harbor	Sands with some fines. Most sites will require at least Tier II testing. Estimated that half should be suitable for beach nourishment or similar beneficial use. Remainder probably suited for construction fill, landfill cover, or other similar use, which may not be economically feasible. Non-usable	~ 15,000 / year (One site per year on a rotating basis.)

		material will likely require upland disposal.	
V	Genesee River Oswego Harbor	Maintained by US Army Corps of Engineers. No further maintenance required for recreational uses. Materials contain significant silts and clays with high nutrient/organic concentrations and traces of other contaminants.	~ 150,000 / year (Each site once every two years.)
Other	Fairbanks Pt./Hughes Marina	Private concern or by contract	0

As currently formulated, the Regional Dredging Management Plan is intended to deal with the channels within classes I through IV. The class V channels are maintained by the Army Corps of Engineers for commercial shipping, generate a large amount of spoil of low quality, which is generally not suited for beneficial use, and require and can utilize large equipment for dredging operations due to the depths involved. The Fairbanks Pt./Hughes Marina site is not part of the plan since the outlet channel to Lake Ontario serves only one private property owner and is properly maintained by that owner. Further, the Little Sodus Bay channel is omitted since Cayuga County is assumed to not be initially participating in the program.

On the basis of maintaining all the class I through IV channels in the three participating counties, the following annual dredging requirements are anticipated:

Classes	Number of Sites	Material/Disposal	Annual Amount (cu yd)
I + II	5	Sands; beach shoreline or other beneficial use.	~ 16,000
III	3	Coarse gravel, stone & cobble; shoreline or construction use.	~ 1,500
IV	5	Sands + some fines; will require testing; some beneficial use possible for shoreline stabilization or construction use.	~ 15,000

As detailed in the inventory database contained in Appendix A, dredging needs for the identified recreational channels are either not being met or are being provided through

private efforts or with sporadic support from local governments. Even the channels originally constructed by the US Army Corps of Engineers with Federal funds are not automatically or regularly maintained. This situation will continue to worsen since Corps of Engineers funding for the dredging of recreational channels is expected to decrease further in the future.

Despite the lack of maintenance, vessel operations have been able to continue in the recreational channels since water levels on Lake Ontario have generally been above average over the last decade. However, the Lake returned to at or below average levels during late 1998 and all through the 1999 boating season, underscoring the consequences of delayed maintenance. As a result, a number of yacht clubs and marinas had to close early and a number of charter boat captains reported shortened operating seasons during 1999.

Given the identified and widely recognized need for regular and dependable maintenance dredging of the recreational channels, the local governments and State of New York have worked together to formulate a plan for funding and conducting the required dredging for the region. The elements of this plan are detailed in the following sections of this report.

The economic impacts, direct and indirect, of dependable, scheduled maintenance dredging and the existence of a single responsible entity are impossible to accurately estimate. It is clear, however, from a number of objective measures that the existing economic activity represented by recreational boating, and the potential economic development potential associated with the existence of good marine facilities along Lake Ontario, are both substantial.

One such measure has been derived on the basis of the number of docks and launch ramps active in the project study area. The number of slips and ramps, by channel location, are summarized in the table below. In addition, an order-of-magnitude estimate is included as to the direct economic activity represented by these facilities by simply assuming \$800 per year in direct local spending per dock and \$2,500 per year for each launch¹. Based upon this, a

¹ Estimates consistent with results reported in *New York's Great Lakes Marinas: A 1990 Analysis and Profile* by David White, New York Sea Grant, State University of New York, Oswego, NY, November 1991.

total direct economic impact of the existing recreational boating facilities is estimated to be on the order of \$4.8 million per year.

Estimated Boat Slip and Launch Economic Value

<u>Site</u> <u>Number</u> <u>Designation</u>	<u>Slips</u>	<u>Launches</u>	<u>Slip Dollar</u> <u>Value</u>	<u>Launch</u> <u>Dollar</u> <u>Value</u>	<u>Total Dollar</u> <u>Value for</u> <u>Channel</u>
1 Sandy Creek	287	3	\$800	\$2,000	\$235,600
2 Braddock Bay	490	6	\$800	\$2,000	\$404,000
3 Long Pond Outlet	20	1	\$800	\$2,000	\$18,000
4 Genesee River	1034	7	\$800	\$2,000	\$841,200
5 Irondequoit Bay	747	5	\$800	\$2,000	\$607,600
6 Bear Creek Harbor	0	3	\$800	\$2,000	\$6,000
7 Pultneyville	170	1	\$800	\$2,000	\$138,000
8 Fairbanks Point/Hughes Marina	37	1	\$800	\$2,000	\$31,600
9 Sodus Bay	1432	11	\$800	\$2,000	\$1,167,600
10 East Bay		2	\$800	\$2,000	\$4,000
11 Port Bay	42	2	\$800	\$2,000	\$37,600
12 Blind Sodus Bay	60	1	\$800	\$2,000	\$50,000
13 Little Sodus Bay	335	2	\$800	\$2,000	\$272,000
14 Oswego Harbor	536	6	\$800	\$2,000	\$440,800
15 Mexico Point/Little Salmon River	249	6	\$800	\$2,000	\$211,200
16 Salmon River/Port Ontario	58	1	\$800	\$2,000	\$48,400
17 Sandy Pond Inlet	358	9	\$800	\$2,000	\$304,400
Totals					\$4,818,000

A second measure of the economic impact of recreational boating is provided by a report prepared by the Wayne County Office of Tourism on an angler survey conducted during the 1998 Lake Ontario Counties (LOC) Trout and Salmon Derby, held over a ten day period during May 1998. Based upon the survey results, it is concluded that this one event resulted in a total revenue generation of over \$2.47 million over the seven county derby region.

While well short of a detailed and extensive economic impact analysis, the above results indicate that the economic impact of recreational boating facilities is substantial. Adequate and regular maintenance of marine access channels is a necessary condition for this economic activity to continue and grow.

C. Program Organization

As discussed in detail in other sections of this report, the Regional Dredging Management Plan requires a centralized organization which will have the responsibility for conducting, or contracting for, the dredging of channels, for obtaining and up-dating necessary permits, and for administering the funds for the dredging.

There are many options available for the organization and administration of the Regional Dredging Management Plan. In choosing among the options, the following desirable elements were identified:

1. A single, centralized organization should be designated for plan implementation, for project accountability and to facilitate and properly manage regulatory permitting.
2. If the dredging is performed by the organization, it should have a dedicated crew trained specifically in dredging operations with the selected equipment.
3. It would be advantageous for any new organization to tap into an existing structure for the provision of administrative support functions (accounting, contracting, payroll and human resources).

Given the above desired features, three organizational options were identified and further evaluated. These are:

1. One Town or County takes lead.

This option would designate one Town or County government as taking the lead and conducting the dredging for the entire region. The designated Town/County would obtain all permits, schedule all work, and either acquire and operate the dredging equipment

and/or contract out for the dredging operations. All work and funding would be done through inter-municipal agreements.

The advantages of this approach are that the existing administrative functions to support the operations are already in place and that dedicated, trained personnel would conduct all operations.

Disadvantages include the potential dilution of effort in support of the dredging operation due to other pressing local needs, the complexity of negotiating and administering the several inter-municipal agreements necessary, the public relations problem associated with having Town/County personnel working for long periods in other regions when other local needs (road work, utility maintenance, etc.) are perceived. Finally, an operation conducted by a Town/County government unit may not be legally available to conduct further contract dredging in harbor interior channels as the opportunity arises.

2. Multi-Town/County Effort

In this approach, several Towns and/or Counties would contribute personnel and/or equipment. For example, one government unit could purchase and operate the dredging equipment while others would supply truck transportation and landside material handling. Another government may provide for upland disposal, in the case of locations where this is necessary.

Under this approach all funding and work would be done through inter-municipal agreements. Funds would be either proportionately distributed or rotated among the governments to pay for the personnel and equipment used. Permits would be the responsibility of the Town or County in which the dredging is scheduled to occur.

There are no clear advantages to this approach. It would be difficult to develop, negotiate and administer the necessary, multiple inter-municipal agreements. The fragmented approach to personnel and equipment will result in less specialized training and, hence,

less efficient operations. Permitting and the responsibility for permit compliance would be spread among several entities losing the advantage of having specialized expertise and centralized record keeping for this function. Finally, as for the one government lead, it is not clear that any additional contract dredging for secondary channels will be legally feasible under this option.

3. Create a New Entity

In this approach, a new entity is created. The new entity has the responsibility to conduct or contract for the dredging work, to obtain and maintain all required regulatory permits and records and, if feasible, contract for additional dredging work on internal channels as the need arises with additional private or government funding. Funding for operations would flow to the new entity from the various funding sources, as discussed in a later section of this report.

The new entity may be a private, not-for-profit corporation, a separate unit of an existing State or regional authority, or a new State chartered authority. It is not recommended that the dredging responsibility be given to an existing or new unit of any existing State government department, such as the NYS Department of Transportation. This is due to the specialized nature of the responsibilities of the new entity and, more importantly, the desire to not have its efforts with respect to the dredging diluted by other needs within the existing Department.

Given the desire to tap into an existing administrative structure, a promising approach is to form a new unit under one of the existing State authorities operating in the region. Some suggested possibilities are the Oswego Port Authority, the Rochester-Genesee Regional Transportation Authority or the Central New York Regional Transportation Authority. It is likely that the enabling legislation creating these authorities would have to be amended to allow for the dredging work. Another possibility is to establish a new, separate unit within the NYS Environmental Facilities Corporation..

Given the likely necessity for State legislative action, it may be advantageous to simply create a new authority to implement the Regional Dredging Management Plan. The enabling legislation could be crafted to allow for expansion of the scope of dredging activities to encompass the entire Lake Ontario/St. Lawrence River shoreline, if desired in the future. As discussed in a later section of this report, funding for Plan implementation will also likely require State legislative action and the creation of a new authority and the provisions necessary for funding could be combined, simplifying the entire process.

Based upon the evaluation of alternatives as outlined above, it is recommended that a new State authority be created with responsibility for the implementation and operation under the Regional Dredging Management Plan. If this proves infeasible, it is recommended that a new unit be established under an existing authority, most likely the Oswego Port Authority, the Rochester-Genesee Regional Transportation Authority, the Central New York Transportation Authority or within the NYS Environmental Facilities Corporation, which would be charged with Plan implementation.

D. Dredging Priorities and Scheduling

Dredging priorities and scheduling have been determined primarily on the basis of necessity, as evidenced by past dredging history. This was determined from the frequency and amount of previous dredging, the physical characteristics and existing protection of each channel, and the type and degree of use. These factors are detailed for each channel in the study area in Appendix A.

On the basis of an evaluation of the above factors, a prioritization and dredging schedule has been developed for the channels identified for maintenance. The schedule is presented on the table below in order of frequency of recommended dredging. For each frequency, the channels to be dredged are identified along with an estimate of the amount of dredging necessary. The estimated amount of dredging is based upon past dredging practices and may be somewhat conservative.

As detailed in the table, a total of approximately 32,500 cubic yards of dredging is anticipated on an annual basis as part of this Plan. It is noted that the 32,500 cubic yard per year total does not include those channels that are regularly maintained by the US Army Corps of Engineers for commercial navigation, the Genesee River and Oswego Harbor.

Channel	Description	Estimated Amount
Dredging Once Each Year		
Braddock Bay Greece (T), Monroe (C)	Unstabilized and unprotected channel in active sand transport area.	~ 7,000 cu yd per year
Sandy Pond Outlet Sandy Creek (T) Oswego (C)	Unstabilized and unprotected channel in active sand transport area.	~ 7,000 cu yd per year
Long Pond Outlet Greece (T)	Small, unprotected channel with sand substrate.	~ 1000 cu yd per year

Monroe (C)		
East Bay Huron (T) Wayne (C)	Coarse gravel, cobble and stone substrate in a partially protected outlet channel.	~ 500 cu yd per year
Port Bay Huron & Wolcott (T) Wayne (C)	Coarse gravel, cobble and stone substrate in a partially protected outlet channel.	~ 500 cu yd per year
Blind Sodus Bay Wolcott (T) Wayne (C)	Coarse gravel, cobble and stone substrate in a partially protected outlet channel.	~ 500 cu yd per year
	Annual Total for Once Per Year Sites	~ 16,500 cu yd
Dredging Once Every Two Years		
Sandy Creek Hamlin (T) Monroe (C)	Protected by partial jetties on both sides. Sand substrate.	~ 1,000 cu yd every other year
Pultneyville Williamson (T) Wayne (C)	Protected by partial jetties on both sides. Sand substrate.	~ 1,000 cu yd every other year
	Annual Total for Once Every Two Years Sites	~1,000 cu yd
Dredging Once Every Five Years		
Irondequoit Bay Monroe (C)	Protected by substantial jetties on both sides. Primarily sand substrate with some fine silts.	~ 15,000 cu yd once every six years
Sodus Bay Wayne (C)	Protected by substantial jetties on both sides. Primarily sand substrate with some fine silts.	~ 15,000 cu yd once every six years
Mexico Point Oswego (C)	Protected by short jetties on both sides. Primarily sand substrate with some fine silts.	~ 15,000 cu yd once every six years
Salmon River Oswego (C)	Protected by substantial jetties on both sides. Primarily sand substrate with some fine silts.	~ 15,000 cu yd once every six years
Bear Creek Harbor Wayne (C)	Protected by substantial jetties on both sides. Primarily sand substrate with some fine silts.	~ 15,000 cu yd once every six years
	Annual Total for Once Every Five Years Sites	~ 15,000 cu yd
Annual Total for Entire Program		~ 32,500 cu yd

E. Dredge Equipment

It is likely that the organization responsible for implementation and operation of the Regional Dredging Management Plan will eventually own and operate dredging equipment. It has been found in other jurisdictions that ownership and operation of equipment is less costly than contracting for dredging services.

There is a wide variety of dredging equipment in use and available. For small scale dredging in confined channels, the primary means of dredging are mechanical and hydraulic.

Mechanical dredging generally involves the use of excavating cranes or shovels mounted on barges. The sediments are dug with the crane or shovel and deposited in immediately adjacent upland or placed on barges for transport to disposal sites. The primary advantages of mechanical dredging are the general availability of excavation equipment and trained operators, the ability to handle a wide variety of sediment types and, for some locations, mechanical dredging can be accomplished from a landside location. The disadvantages include difficulty in containing the sediment without specially designed buckets, the additional costs of disposal via separate barge, the expense of having a tugboat with licensed captain to maneuver the work and disposal barges, and the difficulty of depositing the sediments in shallow water or upland locations from the disposal barges. Finally, while the excavation equipment is generally portable by truck, the associated work barges are generally not and would have to be moved on water, which is much slower and more difficult.

In hydraulic dredging, a powerful suction is created within a piping system and the sediments are sucked up from the bottom, much as a vacuum cleaner works. The head of the inlet pipe is usually equipped with a rotating cutter or horizontal auger to loosen the bottom material, termed a cutterhead or auger dredge, respectively. Sediments brought into the pipe are pumped via pipe extensions to nearby disposal sites or upland sites for eventual disposal. Advantages include high production rates, the ability to contain sediments and create little

turbidity, and the ease of sediment disposal if nearby (within one mile) deposit sites are available. In addition, most hydraulic dredges are self-propelled or easily towed by a small workboat, obviating the need for a tug and licensed captain. Finally, small hydraulic dredges are generally transportable by truck, although a crane may be necessary to launch and load the unit from the water. Disadvantages include more set-up time for the dredge and piping and the need for a specially trained operating crew.

The primary equipment selection factors, and how they apply to the 14 channels identified for regular dredging, are as follows:

- Physical and chemical composition of sediment materials.

Of the 14 channels included in this Plan, 11 have sand or silt/sand sediments that range from loose to highly compact. These sand/silt sites represent 31,000 cubic yards of the annual total 32,500 cubic yards to be dredged. The remaining 3 sites, East Bay, Port Bay and Blind Sodus Bay, have gravel/stone/cobble substrates representing approximately 1,500 cubic yards of dredging annually. As discussed in detail in a later section of this report, the chemical quality of the sediments for all sites is good to very good. The sands and silt/sands are well suited to hydraulic or mechanical dredging. The gravel/stone/cobbles found at the three sites is not suitable for hydraulic dredging and mechanical dredging is the only choice for those locations. Fortunately, all three locations can and have been dredged with land based excavators operating from the channel edge.

- Spoil management and disposal practices.

Given the type and quality of the sediments at the dredging site, the spoil should qualify for nearby beneficial use. This could be in the form of shore protection enhancement, beach restoration or offshore bar enhancement, generally within a short distance (one mile or less) of the dredge sites. This is an ideal situation for hydraulic dredging of the sands and sand/silts. The gravel/stone/cobble sites generally have suitable beneficial uses

addition, it is desirable to have the capability to access sites with as little as 2 feet of depth to allow for contract dredging of internal channels and access fairways.

Overhead obstructions are not a factor in any of the channels included as part of this Plan. In addition, highway access for equipment transport to each site is good with no significant overhead obstructions that might limit such access.

On the basis of the above factors, it is recommended that the entity implementing this Regional Dredging Management Plan equip itself with a ten or twelve inch, portable hydraulic dredge and necessary supporting equipment suitable for pumping sediment a minimum of 3,000 feet. A number of manufacturers can supply the necessary unit and there is the possibility of obtaining a used unit with relatively low operating hours.

It is noted in this regard that the City of Coral Gables, Florida is currently operating its own dredging program with the use of six, 10-inch portable hydraulic dredging units. All the operating units are Model 4010 hydraulic dredges manufactured by Innovative Material Systems, Inc. (IMS) of Olathe, Kansas. Specifications for the IMS portable dredges and similar models by other manufacturers, are contained in Appendix B of this report.

Even with the acquisition of a hydraulic dredging unit, dredging of three sites, East Bay, Port Bay and Blind Sodus Bay in Wayne County, will have to be contracted for or additional mechanical dredging equipment purchased. This is due to the large cobbles and stones present at these locations. Given the small amount of dredging to service these locations, approximately 1,500 cubic yards annually, it will be less costly to contract out the dredging for these sites than to buy dedicated equipment.

F. Spoil Use and Disposal

A continuing problem with dredging operations is disposal of dredge spoils. In the past, in-water disposal adjacent to the dredge area was standard practice. Recognizing that this practice resulted in the loss and degradation of aquatic habitats, disposal was later required at centralized sites, usually located in deep water well away from dredging sites. Over the past decade, a renewed focus has been placed on spoil disposal with an eye toward utilizing the dredged materials in a beneficial way.

A variety of beneficial uses for the spoils to be generated by the proposed Regional Dredging Plan have been investigated. Constraints on potential uses include the small amount of dredging involved, the geographic spread of the dredge sites, and the need to keep spoil disposal costs within reason. Given this, the most promising potential options included use as, or as part of, construction materials, use for daily cover in landfills, or use for beach nourishment and/or erosion protection.

The use of dredge spoil for construction materials is particularly appealing. It provides a beneficial use of an otherwise wasted material and has an economic value that can be used to off set some of the dredging costs. As detailed elsewhere in this report, the vast majority of material to be dredged as part of this Regional Dredging Plan is sand with a much smaller quantity of coarse gravels, stones and cobble.

Sand is one of the ingredients in concrete, mortar and other aggregate mixes. It is also utilized directly in construction for under layer (select fill) and, as a last resort, for general fill purposes. For the western New York region, inquiries indicated that sand prices ranged from \$5.50 to \$10.0 per cubic yard, depending upon composition and eventual use.

In general, any construction use, and especially use in concrete or other such aggregate, requires NYS Department of Transportation (NYS DOT) approval for the material. Samples

of sand taken during the 1999 dredging operation at the Braddock Bay channel were submitted to both a concrete/asphalt manufacturer and to the NYS Department of Transportation for evaluation. In both cases, it was found that the material is too uniformly graded (sorted) by particle size to be used in any construction aggregate mix. In addition, the NYS DOT indicated that the gradation was also too uniform to qualify for select fill. Therefore, only a general construction fill use would be possible, which brings a price at the low end of the range.

Currently, the NYS DOT certifies the material source on the basis of a geological report and sampling. Certification for an underwater source is generally not done. Therefore, to be used for construction fill, the dredged material would have to be initially tested under the NYS DOT Section 203 Specification to see if it could potentially qualify. If so, the material would have to be stockpiled and the NYS DOT would conduct its own test on the stockpile before certifying for use in construction.

Given this amount of handling and testing, and the limited amount of dredged material available at each channel site, it is not believed that use for construction purposes will be a viable beneficial use for the spoil from Regional Dredging Plan operations.

Another potential beneficial use is for landfill daily cover. Landfills must cover disposed trash on a daily basis and frequently must purchase or mine materials for this purpose. Given that some municipalities and Counties operate landfills, it was thought that the provision of landfill cover from dredging may be practicable.

In light of this, contacts were made at the Monroe County, Mill Seat landfill and at the private High Acres landfill in Perinton, NY operated by Waste Management, Inc. Both indicated no need for any landfill cover materials. They are already receiving suitable waste material, such as petroleum contaminated soil, which qualifies for use as daily cover and for which they receive a disposal fee. High Acres Landfill tested a sample of the dredged material from Braddock Bay and quoted a \$25.00 per ton disposal fee, delivered to the

landfill after de-watering. With transportation costs, this will come to more than \$30.00 per ton, making such disposal and beneficial use economically impractical.

The final potential beneficial use identified was to place the dredged materials back into the littoral transport system by depositing it directly to nearby beach, shoreline or near shore waters. This method would work for both sands and the coarse gravels, stone and cobble materials to be encountered. In addition, it has already been approved and utilized as a disposal option for all the channels designated for annual dredging.

As discussed elsewhere, the primary dredged materials to be encountered will be clean sands, gravels, stone and/or cobble. For the study area channels, these materials are believed to primarily originate in the alongshore transport along the Lake shoreline and are deposited in the channels as shallow bars. As the bars grow in width and height, the sand is spread along the channel length.

Since it is primarily derived from along shore sources, it should be acceptable to re-introduce the dredged material to the along-shore transport system. Candidate disposal sites would be high-energy areas, generally where shorelines are receding, for which the biological substrate is relatively devoid of aquatic species. The disposal can be immediately at the shoreline or placed as an off-shore bar in approximately 3 feet of water to act as a temporary wave barrier. Both the NYS DEC and the Army Corps of Engineers have stated that, with further investigation of the proposed disposal areas, such a disposal option could be approved. This will likely require an on-sight visual inspection of the proposed disposal area by a qualified biologist to ascertain that no significant aquatic habitats will be disturbed. It may also require written permission from adjacent landowners allowing for placement of the materials.

The use of a hydraulic dredge, as proposed, will facilitate the disposal of sands in this manner. Suitable disposal sites should be close enough to each channel that material can simply be pumped to the designated disposal site and discharged. The gravels, stone and cobbles derived from the three, small Wayne County bays can be directly deposited adjacent

to the navigation channel or trucked the short distance to areas for which the material can be utilized for shoreline stabilization.

For some sites, the interior portions of the channel may contain a higher percentage of silt. Spoil from these areas will have to continue to be disposed of at offshore, underwater sites or on land. It is anticipated that participating Counties may be able to accept this material as miscellaneous fill for golf courses or other parklands, as opportunities arise.

In summary, it is anticipated that almost all of the spoils generated by the Regional Dredging Management Plan can be beneficially utilized for beach nourishment and erosion protection for nearby shoreline sites. Some land or off-shore disposal may be necessary to meet particular needs, but this should represent at most ten to twenty percent of the annual dredged volume.

G. Permitting

Permits are necessary from both the US Army Corps of Engineers and the NYS Department of Environmental Conservation for dredging operations in the study area waterways. The cost and time spent in obtaining such permits has been cited as an impediment to timely and cost-effective dredging in the past.

Based upon a review of permit application files at both the Army Corps of Engineers and the NYS Department of Environmental Conservation, it has been found that much of the cited delay and frustration with permit issuance is a result of the lack of experience or expertise in the preparation of the application packages or a lack of understanding of the requirements, especially testing, for permit issuance.

A significant advantage of having a single entity responsible for permitting of the proposed dredging operations is the centralization of the permitting information, data on each channel's sediments and their characteristics, and knowledge of dredging operation scheduling and limitations. With this information in hand, no difficulty with environmental permitting for dredging of any of the study area channels is anticipated. In addition, having a firm, advanced schedule for dredging of sites will allow for early permit application, minimizing any delays associated with the review process.

At present, necessary permits for many of the channels are already in place and would merely have to be transferred to the new dredging entity. For all channels, past permit information is available, which will accelerate the process for obtaining updated permits and avoid costly duplication of testing and analysis. For the most part, environmental conditions at the study area channels are known and acceptable for dredging operations. As discussed in a previous section, sediments in almost all cases are known to be clean sands, gravels or coarse stone and cobbles, minimizing the testing necessary to obtain new permits.

All federal permits necessary for dredging in the study area are issued through the Buffalo District office of the Army Corps of Engineers. Discussions with that office have indicated that a Regional Permit may be an appropriate vehicle for implementation of the Regional Dredging Plan. Such an approach has successfully been implemented for the New York Canal Corporation for its dredging operations on the Erie Canal. Existing permits for channel sites would form the basis of this regional permit. Other sites, and any special conditions for them, would be added as they are scheduled for dredging. Almost all sites in the study area, especially those for which dredging is required annually or bi-annually, will qualify for Tier I testing under the Federal permit program. Tier I, based upon past records, physical sediment types, sediment location and source, requires no additional chemical sampling and analysis. Other sites, especially the larger channels scheduled for dredging once every six years, may require in-situ sampling and limited chemical analysis to determine disposal options. This can be scheduled well in advance to avoid delays and the required testing will decrease over time based upon the maintenance of adequate records by the dredging entity.

State permits for dredging will have to be secured from one of two NYS Department of Environmental Conservation offices; the Region 8 office in Avon or the Region 7 office in Syracuse. Expansion of the program to other Counties may require permitting from the Region 6 office in Watertown and/or the Region 9 office in Buffalo. In addition to dealing with multiple offices, unlike the Federal permitting there is no means of consolidating the approvals for all sites into a single regional or general permit. Therefore, individual permits would have to be obtained for each channel site.

Fortunately, NYS DEC maintenance dredging permits can be issued for a seven-year period and, once obtained, can be re-issued with minimal additional testing and information beyond what can easily be obtained and documented during dredging operations under the previous permit.

As discussed in a previous section, the only economically viable beneficial use for the dredge spoil from the study area channels is for beach nourishment and/or erosion protection. This would involve dredge spoil placement in littoral or near-shore upland habitats. Approvals for

this placement would have to be negotiated with the individual NYS DEC offices and would likely require at least a visual inspection by a qualified aquatic biologist to assess habitat conditions in the disposal area. While obtaining permits for this disposal will involve some effort initially, renewal and extensions of this approach should become routine with continuing operation of the dredging program.

In summary, environmental permitting for the proposed dredging program is not anticipated to be a significant problem or involve significant costs. The new entity created to implement the dredging program will quickly obtain the background data, experience and expertise to efficiently obtain and maintain required permits. Most sites have existing permits and available background information that will form the basis for continuing permitting. All Federal required permitting may be combined into a single regional permit and the required State permits are issued for a seven year period and are relatively easy to have re-issued if good records are during dredging and disposal operations.

H. Estimated Costs and Funding

This section summarizes the estimated costs for implementation and operation of the proposed Regional Dredging Management Program and identifies and recommends funding sources.

Program Costs

Program costs are estimated in two separate ways for comparison purposes. One estimate is based upon a unit cost found to be typical for small harbor dredging. This estimate is probably reflective of having all dredging contracted out by the operating entity. The second estimate is based upon the assumed capital plus operating costs for an entity conducting dredging operations on its own with typical hydraulic dredging equipment plus additional contracting costs for three sites unsuited for this type of operation. Both cost estimates are found to be comparable, totaling approximately \$325,000 annually for both capital equipment and operations.

It is noted that the cost estimates should be viewed with caution. Firm costs for initiating and operating the proposed Regional Dredging Management Plan are difficult to predict with complete accuracy. This is primarily due to the fact that there are no public entities conducting comparable dredging of small, recreational harbors on a continuing basis. In addition, program costs are expected to be somewhat higher at project initiation and decrease over time as experience is gained with the operation. Finally, costs are expected to vary somewhat from year to year depending upon the specific harbors scheduled for dredging during the operating season, weather and lake level conditions.

Published cost estimates are also not helpful in this situation. For example, Henshaw, et.al.² give simple estimators for unit costs for dredging based upon US Army Corps of Engineers costs in the Great Lakes. However, the costs given are for large, single projects (minimum 20,000 – 30,000 cubic yards) and include approximately \$236,000 in fixed, mobilization costs. They cite published US Army Corps of Engineers unit costs in the Great Lakes ranging from approximately \$2 to \$3 per cubic yard and US average costs from approximately \$7 to \$15 per cubic yard for navigational dredging. These are, once again, for relatively large scale projects and do not address the very small scale dredging operation anticipated as part of this plan.

The most directly applicable cost data was obtained from the City of Coral Gables, Florida. The city public works department operates six dredge units for maintenance of combined navigation and stormwater conveyance canals. They report program costs averaging \$9.70 per cubic yard and ranging from \$6 to \$7 per cubic yard up to \$14 per cubic yard for individual dredge units depending upon location, dredging and weather conditions and the level of crew experience.

Recognizing these uncertainties, a somewhat conservative estimate has been made for dredging unit costs for this project. The estimate is for cost per cubic yard of dredged material, including disposal and permitting, and is based upon the published dredging project costs, interviews with dredging contractors, recent bids for small scale dredging in the Lake Ontario south shore area, and the per unit costs reported by the City of Coral Gables, Florida.

Given all of the above, it is conservatively estimated that the proposed regional dredging program could be operated on the basis of a nominal \$10 per cubic yard cost, whether bid as a whole on a long-term contract basis or conducted independently by a new entity. This \$10 per cubic yard cost should be adequate to cover all administrative and permitting costs after the first couple of years of operation. Applying a \$10 per cubic yard cost to the projected

² Henshaw, P.F., S. Cervi and J.S. McCorquodale. Simple Cost Estimator for Environmental Dredging in the Great Lakes, *A.S.C.E. Journal of Waterway, Port, Coastal and Ocean Engineering*, Volume 125 No. 5, September/October 1999.

32,500 cubic yards of annual dredging results in an approximate operating cost of \$325,000 per year for the entire program.

An alternative cost estimate is provided by summing operating and capital equipment costs for the proposed project under the assumption that it is self-operated by a new entity. Based upon discussions with dredge manufacturers and the Department of Public Works for the City of Coral Gables, Florida, it is assumed that a three man operating crew will be necessary for the dredge itself plus an additional administrator/program manager. The dredge crew would consist of a chief and two assistants, all trained to operate the dredge and support vessel. This crew would also maintain the dredge and support vessel. The administrator/program manager would be responsible for all administrative and financial functions as well as the procurement and maintenance of environmental permits necessary for the work. For simplicity, an average cost of \$40,000 per year is assumed for each of the four employees, including benefits.

Capital equipment costs are based upon an estimated \$600,000 initial cost for the dredge, support vessel, and support land vehicles. This is amortized over a ten-year period at 6%, for an annual equipment cost of \$81,521.

Added to the capital and labor costs are an estimated \$50,000 per year in expendables and operations, which includes rental costs for a crane to launch the dredge as needed, and a contract cost of \$15,000 per year for the 1,500 cubic yards of gravel/stone/cobble needed to be dredged from the three Wayne County sites with this substrate.

Summing the operating and capital costs under the above assumptions results in an approximate \$306,521 annual program cost, which is close to the \$325,000 estimate obtained through the use of the unit cost of \$10 per cubic yard.

A summary of both cost estimates is contained in the following table:

Program Cost Summary			
Contract Basis			
	cu. yd.	rate	Annual Amount
	32,500	\$10	\$325,000
Total Annual			\$325,000
Self Operating Entity			
Equipment	cost	rate	period
	\$600,000	6%	10 years
annual capital cost			\$81,521
Personnel	crew #	annual crew	
	4	\$40,000	\$160,000
expendables			\$50,000
contract for class III sites			\$15,000
Total Annual			\$306,521

Program Funding Options and Discussion

Funding is the single most difficult component of any dredging plan. There are several different approaches available for funding, each with advantages and potential problems. This section discusses the various approaches and provides some estimates of funding levels under the approaches. Based upon these results, a specific recommendation for program funding is made in the final section entitled Recommended Program Funding.

Six different funding approaches have been examined as part of the development of this Regional Dredging Management Plan. They are:

- Federal Funding Through the Army Corps of Engineers
- Voluntary, Private Funding
- County Funding
- Town Funding Utilizing Harbor Improvement Districts
- User Fee through a Per Slip/Launch Lane Basis
- User Fee through a Boat Registration Add-On

Current dredging in the study area is done with a non-coordinated combination of several of the above funding sources.

Each potential funding source is discussed separately below.

Federal Funding through the Army Corps of Engineers

The Army Corps of Engineers (COE) regularly and adequately maintains all harbors with commercial vessel traffic. This includes the Genesee River and Oswego River in the study area. In addition, the COE has limited funding which can be directed to maintenance dredging of recreational harbors. Such funding for the study area is administered through the Buffalo District office of the COE and covers the entire shoreline of Lake Ontario, the St. Lawrence River and the Niagara River in New York and the Lake Erie shoreline in New York, Pennsylvania and Ohio.

~~The COE funding can only be utilized for maintenance dredging of recreational harbors constructed as Federal projects by the COE.~~ In addition, the level of COE funding for recreational dredging is low and cannot meet the all the dredging needs in the region, even when limited to only Federal project channels. As a result, dredging only occurs when there is a critical need affecting safety and only in response to strong public and political pressure.

The COE has recently announced a new program in which it will allow local or regional governments to “piggy-back” on its dredging operations at Federal projects. This can only be utilized for additional, non-federal area dredging within the Federal project harbors. The local government entity would have to implement the same oversight/management procedures, including bathymetric surveying, as is done by the COE for its project. The local sponsor can fund the COE for this work or provide the services itself. Costs for the additional dredging would be bid with the Federal dredging project or negotiated separately with the chosen Federal contractor. Any cost savings of utilizing this approach would arise solely from the minimization of mobilization costs for the dredging. Given the limitations of this

program, both as to eligible locations and costs, it will not be adequate to meet the needs identified in the study area.

The advantage of COE funding is that it comes with no local or regional cost contribution. The primary disadvantages are that there is not enough funding to meet the needs of the Federal recreational channels and COE funding cannot be used for dredging in the non-Federal recreational channels. In addition, the program is out of the control of local governments and the user community. COE funding for recreational harbor dredging is obviously not adequate, hence the need to develop the Regional Dredging Management Plan.

It is not recommended that Federal funding through the COE be relied upon for operations under the Regional Dredging Management Plan. However, Federal funds should be sought, in conjunction with New York State funds, for capital equipment necessary for the program. To the extent that such funding can be obtained, annual funding allocated to capital equipment can be reduced or eliminated.

Voluntary Private Funding

Six of the identified recreational access channels in the study area are maintained through voluntary, private funding. These consist of Sandy Creek in Monroe County and Bear Creek, Pultneyville Harbor, East Bay, Port Bay and Blind Sodus Bay in Wayne County. Bear Creek is maintained by the Rochester Gas and Electric Corporation as needed to bring equipment to the area for its Ginna Nuclear Power Plant. Sandy Creek and Pultneyville Harbor are both maintained, as needed, by local yacht clubs located near the channel entrances, even though both channels support marinas and launches further upstream. In the case of Sandy Creek, this includes a large public launch, which would likely not be usable without the yacht club maintenance of the access channel to Lake Ontario. Finally, East Bay, Port Bay and Blind Sodus Bay are maintained on an annual basis by voluntary dues to private improvement associations.

The primary problem with private funding is that is not adequate to meet the identified need for dredging in the study area. In addition, it is not equitable to the parties involved. Only six of the fourteen channels identified for maintenance under this Plan have willing and able private dredging sponsors. In addition, dredging of these channels is at the will and at the option of the sponsors, leaving the other users in the system vulnerable to conditions beyond their control.

County Funding

To date, only Oswego County has provided funding for dredging activities. It recently (1999) provided some funding, in conjunction with New York State grant money, for dredging of the Sandy Pond Outlet. Unfortunately, the bid cost exceeded the available funding and the work was not done.

In recognition of the economic activity generated by recreational boating, and the economic development potential of the area waterways, it is reasonable to request County funding for some of the dredging activity proposed as part of this Regional Dredging Management Plan. It is noted that dredging program funding solely by County governments is not recommended. This is due to the fact that, for equity, at least a portion of the project funding should be borne by system users and that at least a portion of the funding should be borne by the State and Federal governments. In addition, continuity and reliability of the program operation is important and should not be subject to short term changes in County funding which could result from a high dependence on this one source.

The proportion of the program costs to be borne by the counties, and the contribution of each of the four counties in the study area, would have to be determined. The following calculations can be utilized for discussion purposes in determining the cost contribution of each county.

Assuming that the four counties will provide the entire program funding, and that the \$306,521 annual cost figure is utilized for the program, individual county contributions could

be based upon an equal share, a per waterbody share, a per boat slip share or a per cubic yard of dredging share. The calculation of county funding for each of these options is summarized in the following table:

County Funding Option				
County	# of waterbodies	# of slips	cu. Yd./yr.	
Monroe	4	1544	11000	
Wayne	6	1704	8000	
Oswego	3	665	13500	
totals	13	3913	32,500	
County	Equal Share	per waterbody	per slip	per cu. Yd.
Monroe	\$100,000	\$100,000	\$128,239	\$110,000
Wayne	\$150,000	\$150,000	\$141,528	\$80,000
Oswego	\$75,000	\$75,000	\$55,233	\$135,000
totals	\$325,000	\$325,000	\$325,000	\$325,000
County	# of waterbodies	# of slips	cu. Yd./yr.	
Monroe	4	1544	11000	

As can be seen from the above figures, individual county funding to support the entire Regional Dredging Plan could range from approximately \$55,233 up to \$150,000 annually, depending upon the cost allocation basis. It is also obvious that no one county dominates in all three allocation measures, number of waterbodies, number of slips, or amount of dredge material.

A specific recommendation for the level and allocation of county funding for the Regional Dredging Management Plan is contained in the section entitled Funding Summary.

Town Funding Utilizing Section 190 Harbor Improvement Districts

Funding for channel dredging could also be requested from the individual Town governments along the shoreline. As noted in an earlier section, there are fourteen different Towns with channels and harbors identified as part of this study. One mechanism for obtaining such funding is the creation of Harbor Improvement Districts pursuant to Section 190 of the NYS Town Law.

The creation and management of Harbor Improvement Districts is governed by the same procedural and legal requirements as all other types of improvement district. This includes the need to obtain petitions from a majority of the land owners, the holding of a Public Hearing and the adoption of a local law creating the district and specifying costs and assessments.

As for the Counties, any Town funding of dredging would have to be allocated among the participating Towns. Funding could be on the basis of an equal share, on the number of docks and/or launch ramps served, or on the basis of the annual average amount of dredging done in support of the harbors in each Town/Village.

The table on the following page provides an estimate of the amount of funding to be provided from each of fourteen Towns under an equal share basis and utilizing a per cubic yard assessment. It is noted that funding levels for individual Towns will vary substantially depending upon the funding allocation basis chosen. For other reasons, discussed below, direct funding from Towns is not being recommended for the Regional Dredging Management Plan and, hence, no further discussion of funding allocation is necessary.

An advantage of direct Town funding of dredging is that the cost of dredging could be assessed principally to those properties on the waterfront through the creation of Harbor Improvement District boundaries. There are questions regarding the equity of doing so, given that open navigation benefits more than just direct waterfront properties. However, these

questions may be superceded by a more practical difficulty regarding the effect on waterfront property tax rates and the impact of this on being able to establish the districts.

Funding on an Equal Share Per Channel Basis			Proportionate Funding by amount per yd.		
	\$25,000			\$10.00	
Town	# of Channels	Annual Contribution	Town	# of cu. Yd.	Annual Contribution
Hamlin	1	\$25,000	Hamlin	500	\$5,000
Greece	2	\$50,000	Greece	7,500	\$75,000
Irondequoit	0.333	\$8,333	Irondequoit	1000	\$10,000
Penfield	0.333	\$8,333	Penfield	1000	\$10,000
Webster	0.333	\$8,333	Webster	1000	\$10,000
Ontario	1	\$25,000	Ontario	3000	\$30,000
Williamson	1	\$25,000	Williamson	500	\$5,000
Sodus	0.5	\$12,500	Sodus	1500	\$15,000
Huron	2	\$50,000	Huron	2250	\$22,500
Wolcott	1.5	\$37,500	Wolcott	750	\$7,500
Mexico	1	\$25,000	Mexico	3000	\$30,000
Richland	1	\$25,000	Richland	3000	\$30,000
Sandy Creek	1	\$25,000	Sandy Creek	7500	\$75,000
	Total	\$325,000	Totals	32500	\$325,000

To assess the impact on tax rates, an analysis was undertaken of the increase in property tax rates necessary in individual Towns to provide funding for the proposed dredging program. For this, it is assumed that the entire program is funded by the Towns and that the Towns utilized additional tax revenues generated by Harbor Improvement Districts. Three Towns in the program were analyzed representing three different development/waterbody scenarios. The analysis was conducted for (1) the Town of Greece, with a large tax base and large amount of dredging needed; (2) the Town of Sandy Creek which also needs substantial dredging, but is rural with a relatively smaller tax base; and (3) the Town of Mexico which is rural with a small tax base and relatively little dredging to do.

For all three Towns, it is assumed that the Harbor Improvement District is town wide and not restricted to waterfront properties. On this basis, the following net change in property tax rates are projected utilizing an equal share basis for the funding allocation among the Towns:

Effect on Tax Rate- Town wide District (using equal share funding)				
Town	Total Taxable	current tax rate	rate increase	percent increase
Mexico	\$14,379,002	\$51.55	\$2.09	4.05%
Sandy Creek	\$5,817,191	\$113.05	\$12.89	11.40%
Greece	\$3,766,486,416	\$5.07	\$0.02	0.39%

As can be seen, the impact on property tax rates could be substantial, 4% – 11%, in the more rural communities. This level of increase would make it politically difficult to establish the town wide improvement districts.

To assess the tax rate impact of including only waterfront properties in the Harbor Improvement Districts, an analysis was undertaken of the tax increase for properties fronting on Braddock Bay and its channels in the Town of Greece. All such properties, commercial and residential, were identified and their assessments obtained. Assuming an equal share per Town funding allocation, the results for the Braddock Bay properties was a 132% property tax increase. Other funding allocation bases would only increase this impact. In addition, the property values around developed Braddock Bay are relatively high and the percentage increase for waterfront properties in other Towns is likely to be much higher.

As noted earlier, the formation of Harbor Improvement Districts requires favorable petition of a majority of the land owners in the district and individual legislation in each of the fourteen Towns. Further, if even one Town does not participate, the entire dredging program is jeopardized. Given these factors, and the anticipated steep tax rate increases necessary to fund the program, it is concluded that funding of the Regional Dredging Management Plan through the formation of Town sponsored Harbor Improvement Districts is not fiscally or politically realistic and is not recommended.

User Fee Through a Per Slip/Launch Lane Charge

The idea of funding through a direct user fee is appealing in that those that principally receive the benefit will pay for the service. One approach to this is to levy a per slip or per launch lane fee for all commercial marinas. The equity and potential pitfalls of this approach are discussed below.

To assess the eventual cost of such an approach, the estimated annual cost of the Regional Dredging Management Program was allocated to the approximately 4,248 commercial boat slips in the study area. This equates to a per slip fee of approximately \$72 per year. This could be reduced somewhat by an additional fee on launch lanes, but provides a rough estimate for feasibility assessment purposes. The \$72 per year fee is less than ten percent of the approximately \$785 average annual rental for boat slips along the south shore of Lake Ontario and, hence, would seem to be a reasonable approach to funding the dredging program. Unfortunately, this approach is not practicable for other reasons.

The first problem has to do with the perception of equity. A commercial marina per slip or per launch lane fee would not be borne by residential properties with docks. In some areas, such property owners would be the major beneficiaries of improved dredging maintenance. In addition, a per slip or launch lane fee would not be borne by boaters utilizing trailers and publicly owned launches, which generally do not assess any fees and have no means in place for collecting fees. The final, and probably most significant problem with this approach is that there is no existing means for assessing and collecting any such fee. Marinas are primarily governed by local land use laws and no county or state agency issues operating permits or any other form of continuing approval. Thus, the institution and collection of any such fee would most likely have to result from individual Town actions all along the shoreline, with the same potential for political problems as funding under Harbor Improvement Districts.

Given the above factors, a user fee in the form of a per slip or per launch lane fee is not recommended as part of the funding for the Regional Dredging Management Plan.

User Fee Through a Boat Registration Add-On

Another source of potential funding for the Regional Dredging Management Plan is a user fee for boaters implemented through an add-on fee applied to boat registrations. At present, all boats powered, even in part, by a motor and operated in New York State waterways are required to register with the New York State Department of Motor Vehicles (NYS DMV). Current registrations are for three years with fees of \$9 for boats up to 16 feet in length, \$18 for boats 16 feet to less than 26 feet, and \$30 for boats of 26 feet or larger.

A model for such an add-on fee exists for snowmobiles. Snowmobiles operated in New York, even on a temporary basis, are required to obtain a NYS DMV registration. Current annual fees are \$15 for New York residents and \$25 for non-residents. Of this, all but \$5 is utilized for snowmobile trail establishment and maintenance. The maintenance fees are collected by the NYS DMV and then transferred to participating County governments. The Counties, in turn, distribute the funds to volunteer organizations and clubs for the actual trail work.

A similar system could be established, through new State legislation, for all or partial funding for the Regional Dredging Plan program with a similar add-on fee for boat registrations.

To assess the required level of such a fee, boat registration figures for the Counties in the study area were compiled and analyzed. The results, assuming full funding of the dredging program through such a fee, are shown in the following table.

Full Funding by Boat Registration Add-On		
County	# of boat registrations (1997)	Amount per County
Monroe	31,904	\$211,604
Wayne	6,963	\$46,182
Oswego	10,134	\$67,214
Totals	49,001	\$325,000
Annual fee per boat	\$6.63	

The results indicate that an average annual fee of \$6.63 per registered boat in the study area Counties would be sufficient to fully fund the Regional Dredging Plan program. As with the registration fee, it is desirable to base the actual fee imposed on vessels by their size. A proposal for this is discussed below.

Full funding of the dredging program through an add-on fee is not recommended for reasons of equity. At least a portion of the benefit provided by the program would flow to boaters not residing in the study area Counties. In addition, some boaters resident in the Counties do not utilize Lake Ontario for boating. Finally, the economic benefits of increased use of the identified channels and harbors would flow to the community, regional and state economy and, therefore, funding should also be provided from this broader base.

Given these factors, only partial funding through a registration add-on fee is recommended. As is done for registrations, the fee should be tied to the vessel size. A simple allocation formula can be developed on the basis of the observed size distribution of the registered vessels. The total required funding is allocated to vessels in the three registration size classes on the basis of the total registration dollars collected for each class. The calculations and results on this basis are summarized in the table following on the following page.

As shown, the annual add-on fee would vary from \$3.44 to \$11.48 per year depending upon the vessel size. Full project funding by this means would result in an approximate 115% increase in the boat registration fees, which is probably excessive. However, this same

allocation formula is recommended for use to support partial funding of the dredging program, as discussed in the next section of this report.

Registration Add-On Fee by Vessel Size For Full Program Funding			
County	< 16'	16' to 25'	> 25'
Monroe	13,362	16,494	2,128
Wayne	3,096	3,601	359
Oswego	5,060	4,475	413
Totals	21,518	24,570	2,900
annual reg. Fee	3	6	10
# x annual reg. Fee	\$64,554	\$147,420	\$29,000
fraction of total	0.268	0.612	0.120
annual dredging total allocation	\$87,063.54	\$198,824.35	\$39,112.10
annual add-on per boat	\$4.05	\$8.09	\$13.49
Add-on percent	115%	115%	115%

Recommended Program Funding

On the basis of feedback from the participating municipalities and the NYS DOS, and on the basis of the equity considerations and funding levels required, a combination of local, State, Federal and user fee sources are recommended for funding of the proposed Regional Dredging Management Plan. The specific allocation recommended among these sources is based upon the following considerations:

- County funding should be utilized to support at least one-half of the annual operations and should not be in excess of \$50,000 per year per county.
- Federal/State contribution should be directed toward capital equipment procurement, which is more easily obtained through one-time grant funding and justified as start-up costs.
- Boat registration add-on fees should make up the difference needed for annual operating costs.

Based upon the above percentages, the following funding amounts are recommended on an annual and one-time basis:

Recommended Funding By Source	
	<u>Annual</u>
Monroe County	\$37,500
Wayne County	\$37,500
Oswego County	\$37,500
Federal/State (Capital Equipment)	100,000
Boat Registration Add-On Fee	\$112,500
Totals	\$325,000

It is noted that if Cayuga County, or any other county, chooses to participate in this program, the contribution for the other three participating Counties would be somewhat lower. The specific contribution to be provided by other participants would be determined by negotiation after establishment of the program.

On the basis of the recommended funding levels, the following add-on boat registration fee is calculated by vessel size. This is calculated on the basis of participation by the three participating Counties only.

Annual Add-on Fee By Vessel Size			
Boat Size	< 16'	16' to 25'	> 25'
Annual Add-On Fee	\$1.40	\$2.80	\$4.67

It is noted that additional program funding may be derived by contract dredging of non-covered areas with voluntary private or local government funding. This aspect will evolve

over time and may be used for a capital equipment replacement fund or to reduce the operating costs contribution from the Counties or from the registration add-on fee.

It is further recommended that as additional Counties choose to participate in this program, the incoming Counties be assessed an equitable operating share cost plus a one-time capital equipment entry fee.

Appendix A
Inventory Database