A Report to the State Legislature As Required by P.L. 1988 c. 117 - The Marine Sewage Treatment Act

The Availability of and Demand for Sanitary Sewage Handling Facilities on New Jersey's Coastal Waters

New Jersey Department of Environmental Protection
Division of Coastal Resources

Acknowledgements

This report was prepared by Lawrence J. Baier, Principal Planner, in the Department of Environmental Protection's, Division of Coastal Resources under the supervision and direction of the Division's Assistant Director for Planning, Steven C. Whitney, and Director John R. Weingart. The Division is grateful to Mr. John Tiedemann, of the New Jersey Sea Grant Marine Advisory Service, for the information and assistance he provided.

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New Jersey Department of Environmental Protection

Division of Coastal Resources

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I. Introduction and Purpose

Recent public interest in protecting the coastal environment has resulted in new initiatives by all levels of government, the private sector, citizens groups and concerned individuals. One legislative action culminated September 1, 1988 in Governor Kean's signing into law P.L. 1988 c. 117. This Marine Sewage Treatment Act, sponsored by Assemblyman Anthony Villane and Senator Frank Pallone, concerns watercraft sewage disposal. The intent of the Act is to reduce overboard disposal of sewage by providing adequate portside collection devices. In brief, the Act:

1. prohibits the discharge of sewage in "No Discharge" zones designated by the U.S. Environmental Protection Agency (US EPA);

2. directs the Department of Environmental Protection (DEP) to study the supply of, and demand for, sewage collection facilities related to watercraft;

3. requires all publicly owned or operated marinas to provide watercraft sewage collection facilities;

4. empowers the DEP to adopt rules and regulations as necessary to implement the Act; and

5. directs the DEP to apply to the US EPA for "No Discharge" designations.

Sewerage collection facilities, as specified in the Act, consist of pumpout facilities for Type III marine sanitation devices (MSDs) and emptying receptacles for portable toilets.

This report has been prepared to satisfy the requirements of Section 3 of the Act. The report assesses the supply of, and demand for, pumpout facilities and emptying receptacles, and evaluates the effectiveness of existing regulations related to those facilities. The conclusions and options presented in the last two sections of this report should help the Legislature and DEP to develop strategies for realizing the goals of the Act, and for directing future regulatory efforts related to this subject.

This report does not attempt to quantify the water quality impacts associated with boating. It is clear, however, that water quality impacts associated with boating can be locally significant, (Vernam and Connell, 1984; Robinson and Horzepa, 1988). Areas where boats are concentrated, such as marinas, consistently reflect increased fecal coliform and total coliform counts (Vernam and Connel, 1984). These elevated counts affect shellfish classification resulting in the condemnation of beds. This degradation of water quality also makes primary contact recreation unattractive if not unhealthy.

Although the boating public is a visable contributor to water pollution, it would be unfair and incorrect to point to them as the major source of water quality degradation. In fact, studies have found that water pollution attributable to boating is minimal when compared to nonpoint sources such as runoff (Faust, 1978). Nonetheless, a successful attempt at

curtailing the pollution of New Jersey's coastal waters must necessarily address all identifiable sources. This report is designed to concentrate on but one aspect of this problem, the sewage effluent generated by New Jersey's coastal commercial and recreational fleet.

II. Marine Sanitation Devices and Pumpout Facilities

Marine Sanitation Devices, or MSDs, are defined by Section 312 of the Federal Clean Water Act as any equipment installed permanently on board a vessel which is designed to receive, retain, treat or discharge sewage. The Clean Water Act prohibits the discharge of raw sewage in U.S. Territorial waters; therefore all vessels equipped with a permanent head or toilet must use an approved MSD. Three types of MSDs are certified by the U.S. Coast Guard pursuant to the Clean Water Act. These types are described as follows (USCG, 1986):

Type I = Sewage is ground up (macerated) and disinfected in a flow-through system, and the effluent is discharged overboard with no visable floating solids and less than 1000 fecal coliform/100 ml.

Type II = Sewage is macerated and disinfected in a flow-through system, and the effluent discharged must have less than 150 mg/l suspended solids and less than 200 fecal coliform/100 ml.

Type III = Includes recirculating and incinerating MSD's and holding tanks. Holding tanks are the most common Type III MSD found on recreational boats, where sewage is stored on board until it can be pumped out to an onshore treatment facility.

While Type III MSD's do not provide any treatment of the sewage, they do retain the sewage on board until it can be properly discharged on land. A Type III system therefore has the least impact on water quality, followed by Type II and then by Type I. Unfortunately, many Type III MSDs have been fitted with "Y" valves allowing the illegal direct discharge of raw sewage (Tanski, 1988).

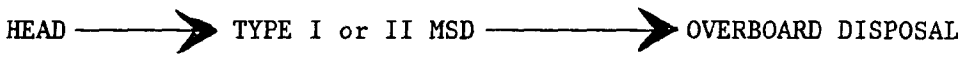
The U.S. Coast Guard regulations state that vessels under 65 feet in length are not required to have an MSD unless a permanent head is installed. All vessels over 65 feet in length must be equipped with either a Type II or Type III unit. Both the Type I and Type II MSD's require power to operate. As a result, smaller boats and sailboats with on board heads are more likely to be equipped with Type III MSD's.

In addition to the U.S. Coast Guard regulations, the Federal Clean Water Act allows any state to completely prohibit the discharge of sewage from all vessels, whether treated or not, into waters which that state determines require greater protection and enhancement (Section 312). That prohibition, however, may not take effect until the Administrator of the Environmental Protection Agency, (US EPA) determines that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available, for such waters to which the prohibition would apply.

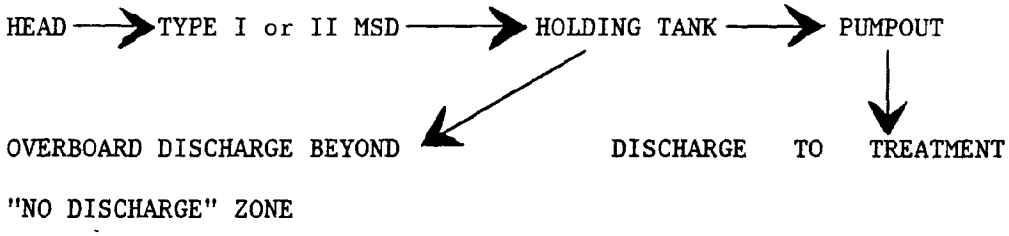
Since such a prohibition of discharge applies to treated as well as untreated sewage, it would be unlawful to use a flow-through marine sanitation device (ie Type I and II MSDs) within designated waters. The

solutions for the boater are to secure the head while operating in the "No Discharge" area, or to retrofit the vessel with a holding tank.

Typical flow-through system



Retrofitted System



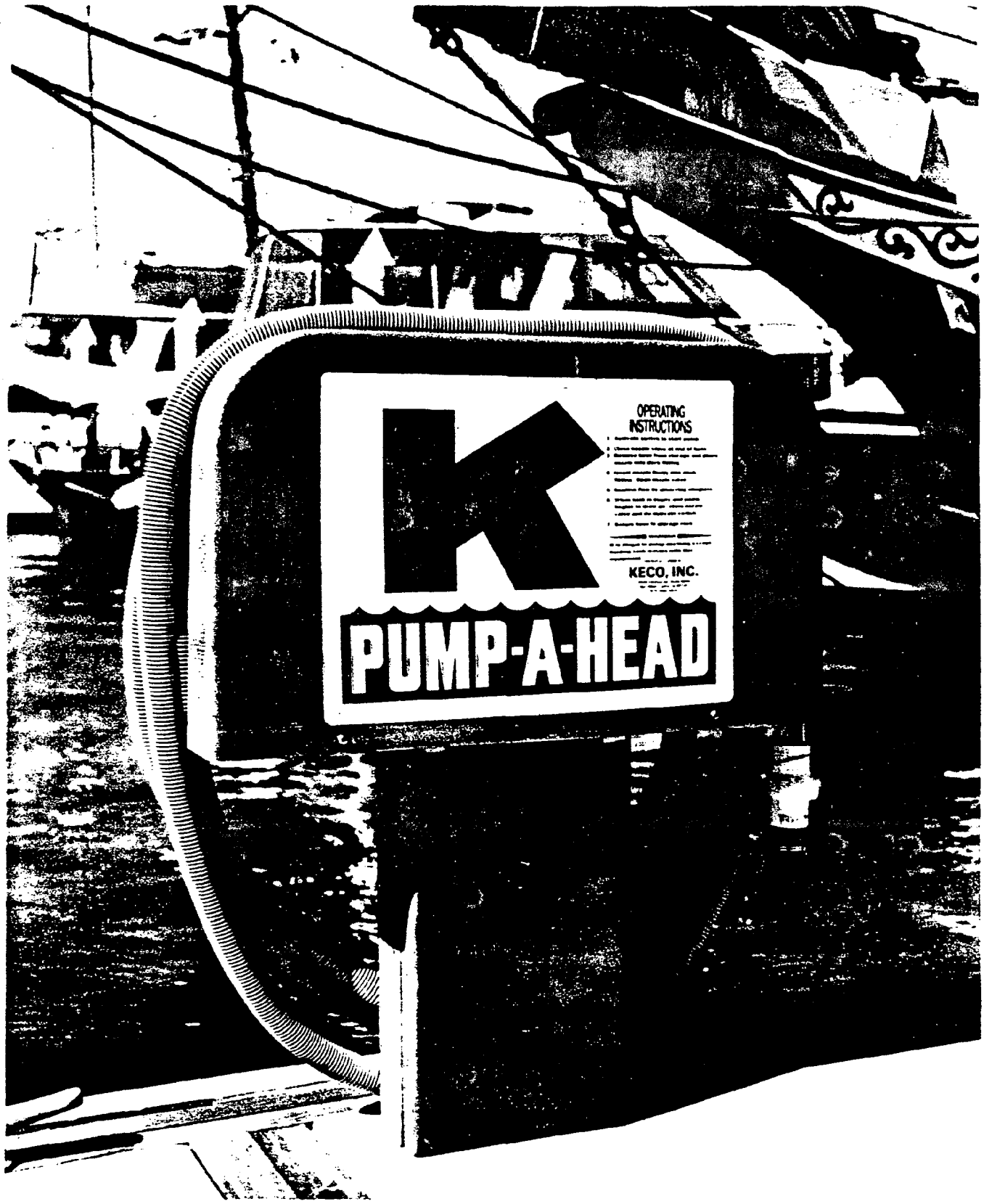
Two estimates for retrofitting a flow through system are provided:

Raritan Engineering - 5 gallon holding tank = $120 + installation

Boat U.S. - 15 to 40 gallon holding tank rigid or plastic = $100-$200
Installation estimated 2 hours = $100

Beyond the cost of the holding tank and its installation, the other major problem which could be expected is a lack of space on board to accommodate the new holding tank.

FIGURE 1



THE PERFECT PUMP-OUT SYSTEM FOR SANITARY WASTE HOLDING TANKS.

Type III MSD's, or holding tanks, require an onshore method of disposal, commonly referred to as a pumpout facility. Type II MSD's may also require periodic pumpout of sludges accumulated in the treatment process. Pumpout units generally function like a vacuum cleaner: driven by an electric motor, the unit creates differential pressure which sucks the sewage from the holding tank, through an orifice in the ship's hull or deck.

Three individual pumpout designs are available; marina-wide systems, portable systems, and slipside systems. Marina-wide systems consist of one or two fixed facilities located in an accessible area such as a fuel dock where boats dock temporarily while the holding tank is emptied (figure 1). The evacuation process time is estimated at five minutes from start to end for standard 40 gallon holding tanks. Fixed marina-wide systems can be hooked directly into a sanitary sewer system or into a larger, on shore, holding tank which would in turn be pumped out by a sewage or septic scavenger hauler. The onshore connection may in part dictate the placement of the fixed pumpout unit; however, accessibility is of primary importance in utility. The cost of a fixed pumpout unit is approximately $4000 not including installation charges (KECO, 1988). Installation costs will vary depending on the availability of sewer and electric access, but generally can be accomplished for about $1000-$1200.

Portable pumpout systems are similar to the marina-wide system in component and function. Two differences are that the components are mobile being mounted on a cart, and a 30-40 gallon holding tank is usually employed to contain the pumped sewage, since hundreds of feet of hose may otherwise be needed (figure 2). The sewage is then discharged from the mobile unit

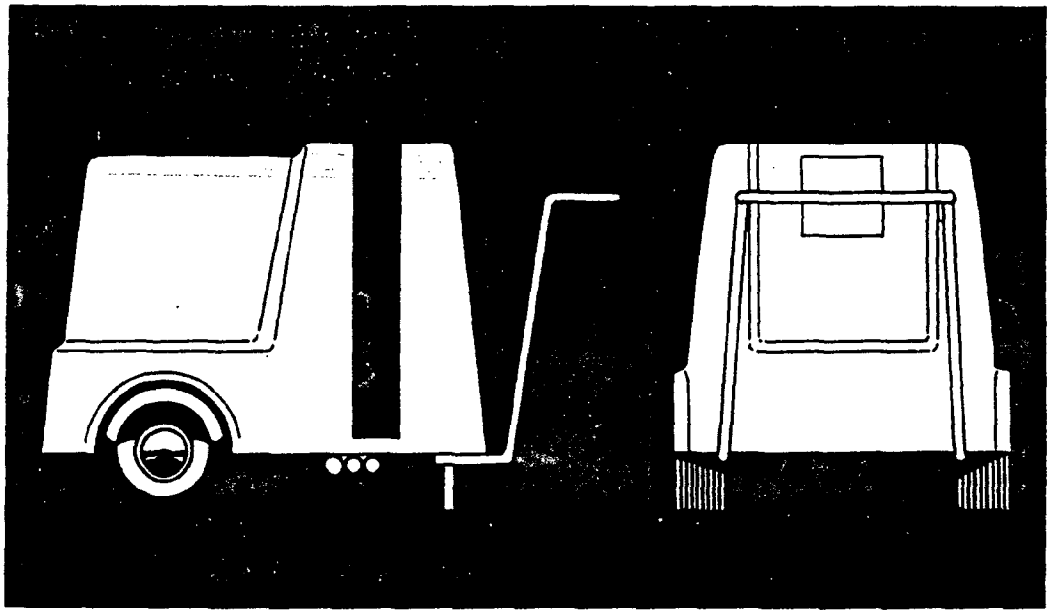
FIGURE 2

Vac-matic T.M.

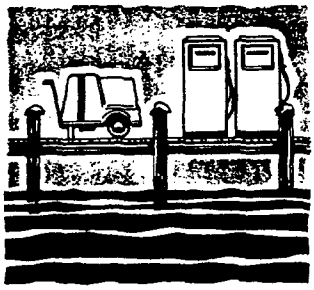
SPECIFICATIONS

PORTABLE PUMP-OUT SYSTEM FOR HOLDING TANKS

- 110/220 Volt AC Explosion-proof Motor
- Fiberglass Housing
- Weighs only 125 lbs.
- 20 feet of Non-collapsing Hose 1-1/2" Dia.
- 20 foot Fresh Water Back Flush Hose
- 10 foot Fresh Water Pick-up Hose
- Special Installation
- All Fittings are Quick Connect Type

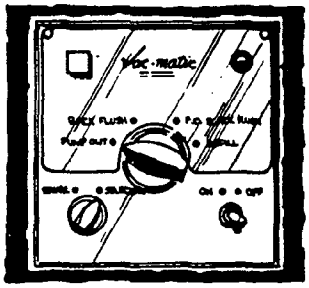


INSTALLATION:



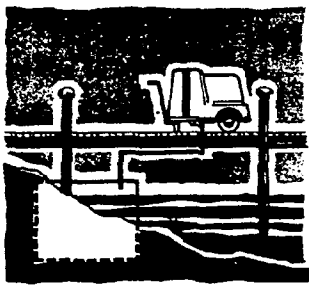
Easy installation any place with fresh water supply (city, well, lake or river) and 110/220 volt, 60 cycle, electrical service.

CONTROLS:



Simple indicator knob positions all cycle functions (pump-out, back flush, back flush pump out, refill head). Waste discharge switch, on-off light and over-flow safety light.

OPTION:



Special permanent installations are possible for convenient locations. For example the Vacmatic can be positioned on a dock or in a pump house with permanent sewer connections and water supply.

OPTION:

Portable 100 gallon trailer mounted holding tank and Vacmatic for marinas without simple access to disposal.

NECO MARINE DIVISION
OF **NEUMANN** ENGRAVING COMPANY
32700 INDUSTRIAL AVENUE • MADISON HEIGHTS, MICHIGAN 48071 • (313) 585-2595

Litho In U.S.A.

U.S. Patent No. 3,780,757

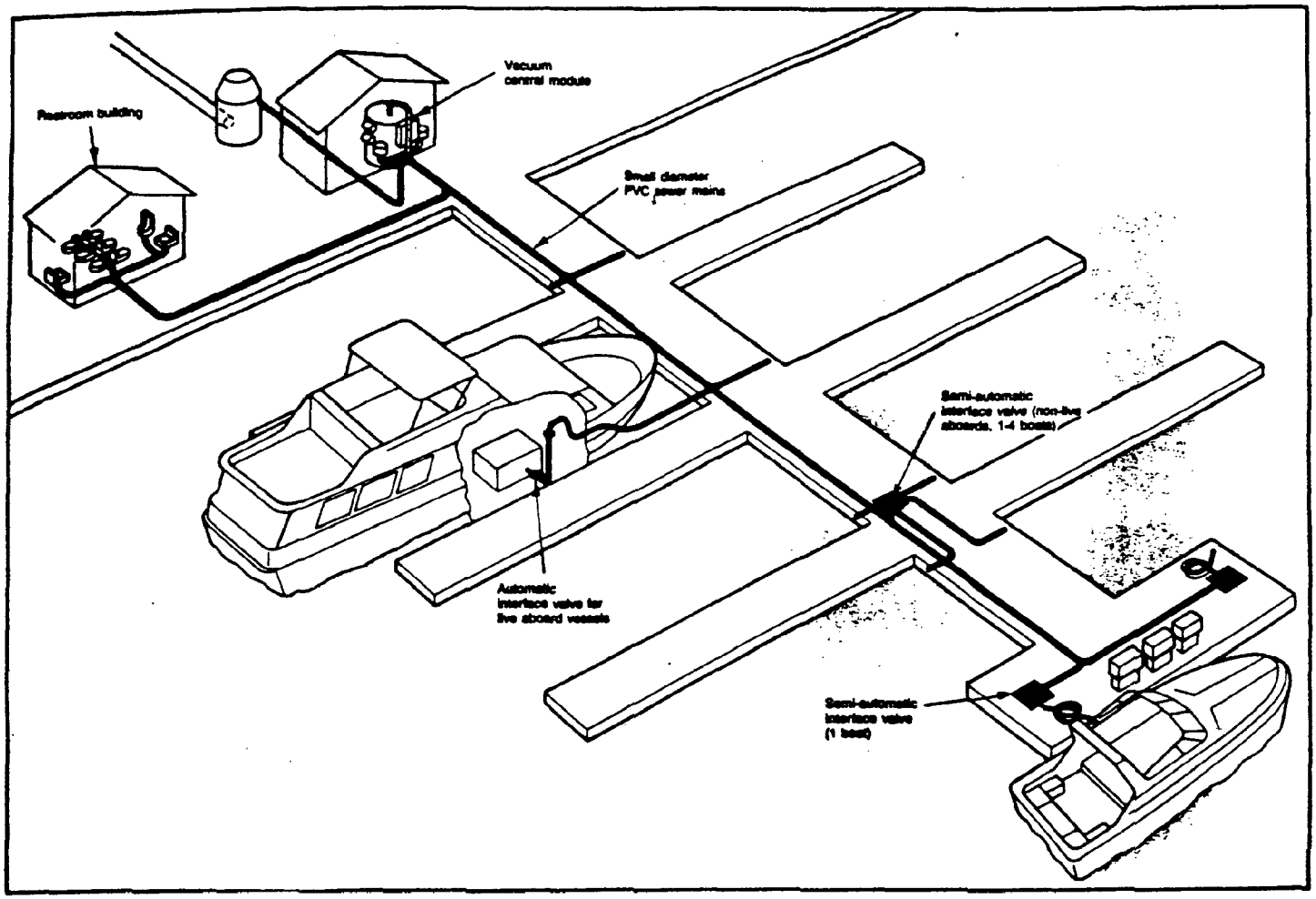
into either a sanitary sewer system or larger permanent holding tank. The advantage of a portable unit is accessibility, as it can be positioned at any slip in the marina for use, provided electricity is available. The disadvantage is in the time and manpower needed to move and empty the unit. The average cost of a commercially available portable pumpout unit is also estimated at $4,000 (NEUMAN 1988; KECO, 1988), although the inventive have built working units for $500-$1000. Installation costs are negligible, assuming electricity is provided slip side. If electric is not provided throughout the marina, a fixed unit would be a better option.

The third pumpout system is referred to as a slipside system, wherein each slip has access to the pumpout system (figure 3). These systems are recommended for live-aboard marinas where continuous attachment to the sewer system is necessary. Slipside systems are generally large requiring more vacuum pressure and a great deal of vacuum hose and interfacing. The cost of the system and its installation is much higher than the previously described systems, starting at $20,000 (UZAR, Pers. Comm.), making it impractical for most marinas. The advantage of this system is constant and convenient accessibility by slips.

Portable toilets are not required to be equipped with an MSD pursuant to the Federal Clean Water Act because they are not stationary. Most portable toilets function like a holding tank but require a dump station in lieu of a pumpout unit. It is therefore necessary to provide convenient emptying receptacles for portable toilets to reduce illegal overboard disposal. Emptying receptacles for portable toilets vary from nothing more than a dedicated restroom stall to more elaborate contrivances shaped like a

FIGURE 3

The engineered solution for marina sewage collection . . .



ENVIROVAC sewage collection systems

System description

ENVIROVAC sewage collection systems offer a sanitary and convenient means for boat owners and operators to empty their sewage holding tanks. The typical system consists of a vacuum central module, 2″ and 3″ PVC vacuum sewer mains and vacúum interface valves which isolate the vacuum system from the individual holding tanks. The vacuum mains, which do not require continuous slope, are easily installed alongside the dock or within the floating pier. Sewage is transported from a boat's holding tank through the mains to the vacuum central module where it is then automatically pumped to a gravity sewer or treatment plant.

System operation

A vacuum pump maintains a constant vacuum of half an atmosphere in the collection tank and in the mains. The differential air pressure (7-8 psi) provides the motive force for sewage transport, and also provides the power for automatic interface valve operation, eliminating the need for an electrical power source at every boat connection. The use of vacuum eliminates the possibility of water pollution caused by leaking or broken gravity mains. If the vacuum main breaks, air is drawn into the pipe. Sewage will not leak out of the vacuum main.

Engineered for reliable, trouble-free operation

ENVIROVAC sewage collection systems are designed to provide you with years of service with a minimum of maintenance. No specialized operator is required. Local representatives can also provide on-the-spot service and assistance. ENVIROVAC's worldwide experience in a variety of vacuum collection applications goes into every system we design.

large funnel which tie into the sanitary sewer line. These receptacles are not costly assuming that the marina is sewered though a bit of imagination may be required. Recently, commercially available units have come on the market and cost roughly $1000 (figure 4).

Related to the provision of pumpout facilities and portable toilet emptying receptacles are concerns over the impact that marine waste has on the sewage treatment system. John Laurita, of the DEP's Division of Water Resources, Bureau of Municipal Waste Management, does not believe that the waste flows generated from pumpouts will be large enough to have a significant adverse effect on the treatment plant's operation: the marine waste is diluted by the large volumes of residential waste handled by municipal or regional facilities.

Other concerns related to sanitary sewer hookups involve permitting. Currently, no reliable estimate of the wasteflow generated from a pumpout facility is available, but it is assumed that the wasteflow is less than the 2,000 gallons per day threshold; therefore no State permit is required. Permission to hookup is required from the utility authority operating the sewage treatment plant.

Where sanitary sewer lines are not available, because the site is located outside of a sewer service area or is within an area where a sewer connection ban is imposed, the alternative is to discharge to a septic system, or to a large holding tank and have the waste collected and disposed of by a private scavenger hauler.

WE LOVE KLEEN WATER

PUMP-A-HEAD SAN DIEGO, CA 619-298-3800

FIGURE 4

New! From the maker of PUMP-A-HEAD - an ingenious portable-potty waste station for marinas, campgrounds, service stations, etc.

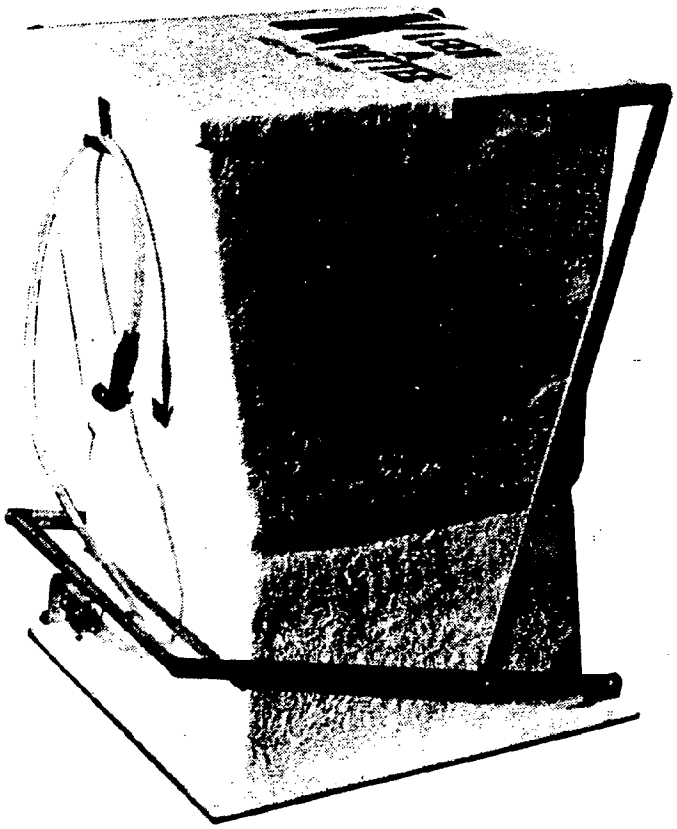
KLEEN-A-POTTEE

Strong and sturdy, safe and sanitary!

There's nothing handier than a portable-potty when you need it ... and nothing worse than when you have to empty and clean it. As a solution, and following the success of PUMP-A-HEAD, we designed the all new KLEEN-A-POTTEE.

This unit can be used in conjunction with a PUMP-A-HEAD, or may be directly plumbed into a sewer line.

Reinforced fiberglass, stainless steel, handy rinse hose, and best of all, foolproof waste disposal with no mess. Odorproof and self-emptying means you'll never have unsanitary restrooms again ... and your customers will appreciate your thoughtfulness.



"Why didn't they think of this twenty years ago?"

For information and specifications - (619) 298-3800

PUMP-A-HEAD

3235 Hancock St.
Suite 200
San Diego, CA 92110

Smaller waste treatment systems and septic systems are more susceptible to failure by the introduction of marine generated waste. This is attributable to any of three sources of problems: 1) the salt water used to flush the on board head may damage metal piping or other metal surfaces of the treatment system; 2) chlorination or other disinfectant and preservative chemicals may destroy the bacteria and consequently the microbial decomposition which is intrinsic to the treatment of waste in septic and other treatment systems; or 3) the waste load may be too concentrated and overtax the system. Any of these complications could render the treatment ineffectual resulting in pollution emanating from the system itself.

The strength of the waste and types and concentrations of preservatives found in recreational vehicle (RV) holding tanks are essentially the same as the contents of marine holding tanks. A study conducted by Sanitary Engineering Research Laboratory, University of California, Berkeley, June 1980 titled "Recreational Vehicle Waste Disposal in Roadside Rest Septic Tank Systems" concludes that the quality of effluent leaving the septic system through the leachate field is not significantly degraded by the addition of RV waste. The study does acknowledge that the addition of formaldehyde reduces the rate of microbial decomposition of slugde accumulated in the septic tanks; resulting in the need for more frequent tank pumpage (Berkeley, 1980).

While private licensed scavenger haulers are registered by the DEP Division of Solid Waste Management, there is no obligation on the part of the hauler to discharge at any one location, and the waste itself is not tracked by the Department. If the waste is properly handled by the hauler,

it is introduced into a public sewage treatment plant at a point specified by the municipal or regional utilities authority. However, there is no method of tracking hauled waste with any degree of confidence.

One must consider the possibility that an unscrupulous marina operator or septage hauler might, for the sake of convenience or saving money, discharge the collected sewage illegally and untreated. While this practice is probably not common, the possibility can be avoided by having pumpouts discharge to sanitary sewer collector lines which lead to large sewage treatment plants wherever possible.

III. Supply of Pumpouts in New Jersey

All activities taking place in New Jersey's tidal waters require a Waterfront Development Permit from the DEP issued under the authority of N.J.S.A. 12:5-3. The Rules on Coastal Resources and Development, (N.J.A.C. 7:7E-1.1 et seq.) are applied to Waterfront Development Permit Applications to evaluate the proposal's compliance or conflict with the Department's goals and objectives. The Department has been requiring MSD pumpout facilities as a condition of approval for new or expanded marinas of 10 or more slips since February 6, 1986.

Since 1986, the DEP's Division of Coastal Resources has reviewed 125 applications for boating facilities with 10 or more slips. Nearly half of those applications were for maintenance dredging or dock rehabilitation and included no expansion. They were, therefore, not subject to the pumpout requirement.

The Division has issued 48 permits with a condition requiring a pumpout facility, and has another 19 applications pending. This includes condominium and townhouse developments in addition to traditional marinas. Since these condominium docks are not likely to be open to the general boating public, they were differentiated from traditional marinas. Two of the marinas at which pumpouts are required are involved in permit appeal proceedings, and two others are known to be in violation of their permits.

These findings were compared with information gathered by John Tiedemann, of the New Jersey Sea Grant Program, as part of his ongoing MSD

pumpout usage study. Tiedemann's study identified only existing pumpouts. Contrasting these lists resulted in the identification of 14 pumpouts not required by permit and the confirmation of nine pumpouts required by permit conditions that are in operation.

SUMMARY OF PUMPOUT SUPPLY

	In Operation	Required but Unconfirmed	Pending	Appeal	Violation	Total
Condo-miniums	0	9	4	0	0	13
Marinas	23	26	15	2	2	68
TOTAL	23	35	19	2	2	81

Since Waterfront Development Permits are valid for a term of five years and remain in force even if the property is sold, some of the permitted developments have not yet been constructed. The Division is currently tracking the 35 approved permits where pumpouts have not been confirmed to ensure compliance with permit conditions.

Lastly, the supply study involved the identification of all publicly owned or operated marinas in the state. Section 3 of the 1988 Marine Sewage Treatment Act requires all publicly owned or operated marinas, which accomodate vessels equipped with marine sanitation devices, to provide sewage pumpout facilities and portable toilet emptying receptacles. The initial cataloguing of these facilities was obtained by researching the Boating Almanac (BA, 1987). This survey lists 23 State, county, and municipal marinas in New Jersey.

PUBLICLY OWNED MARINAS

State 6

County 1

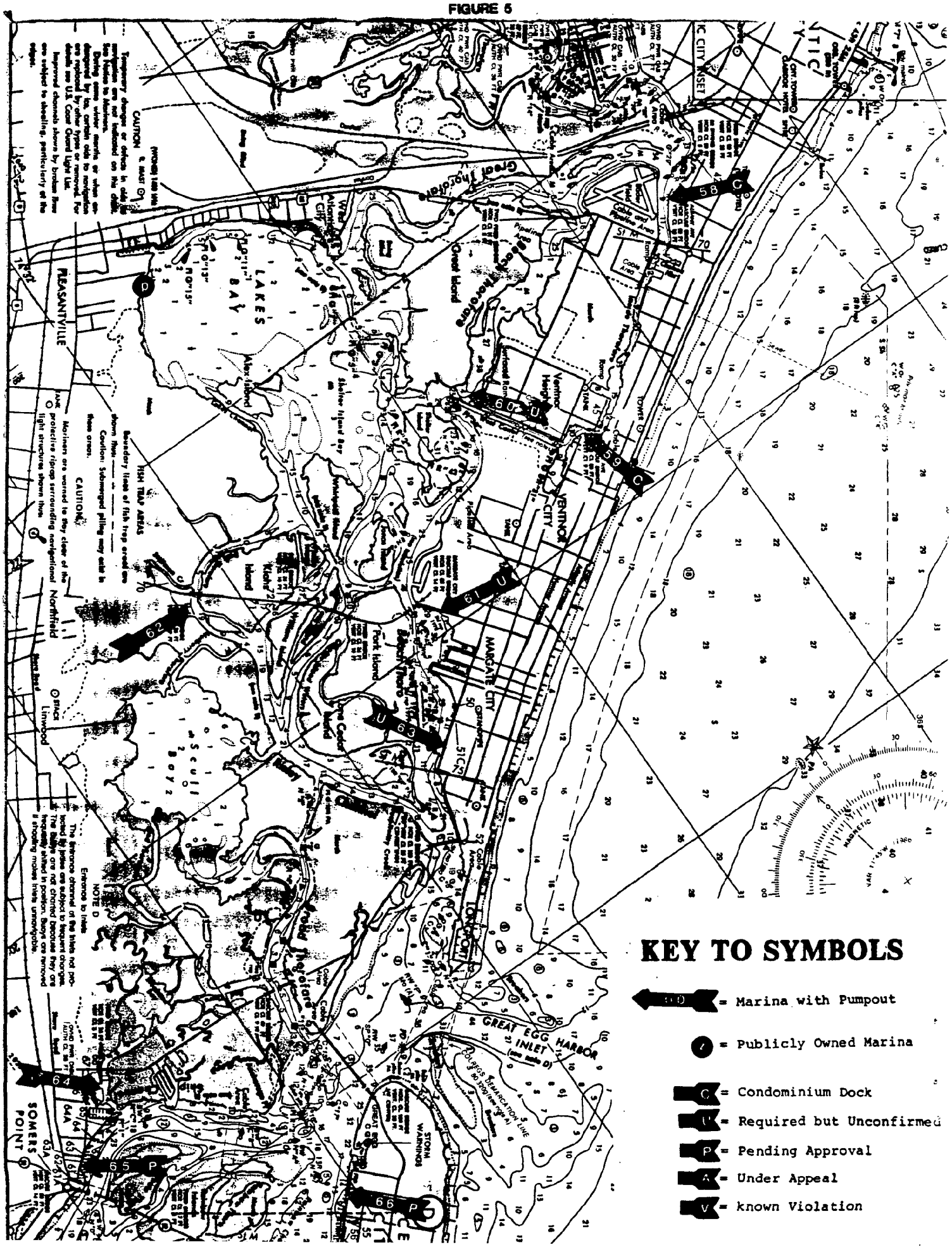
Municipal 16

At present, the Division has found none of these public marinas provide pumpout facilities. The DEP's Division of Parks and Forestry has purchased five pumpout units which will be installed at the State operated marinas prior to the 1989 boating season. The sixth State marina is located on Division of Fish, Game and Wildlife lands and operated privately. Compliance will be achieved through the operator's leases.

Further, the Division of Coastal Resources has secured funding for two pumpouts from the National Oceanic and Atmospheric Administration (NOAA) for placement in the Navesink River; one of which will be placed at the Red Bank Municipal Boat Basin this year. In addition, the Division has sent a letter to all coastal municipalities requesting information needed to assess the applicability of this Marine Sewage Treatment Act to each individual municipality and alerting municipal officials of their responsibility under the Act.

All existing and pending pumpout facilities have been located on the National Oceanic and Atmospheric Administration, (NOAA) Nautical Charts, keyed to a master list (Appendix 1) and symbolized to represent the status of the respective pumpout facilities, (figure 5).

FIGURE 5


KEY TO SYMBOLS
= Marina with Pumpout
= Publicly Owned Marina
C = Condominium Dock
U = Required but Unconfirmed
P = Pending Approval
A = Under Appeal
V = known Violation
LAKES BAY
PLEASANTVILLE
VENTNOR CITY
MARGATE CITY
LONGPORT
GREAT EGG HARBOR INLET
SOMERS POINT
Great Thoroughfare
Great Island
Scull Bay
Linwood
Northfield
58 C
59 C
60 U
61 U
62
63 U
64
65 P
66 P

PUMPOUT UNITS PROVIDED PER WATERBODY

	MARINAS		CONDOS		PENDING	APPEAL	VIOLATION	PUBLIC DOCKS	TOTAL
	C	U	C	U					
Hudson River	1	2			3[2]			(1)[2]	6
Arthur Kill								3	3
Raritan River					1				1
Raritan Bay	1	1						2	4
Sandy Hook Bay				1				1	2
Shrewsbury River		1		1	2				4
Navesink River		2		4	1		1	1	9
Shark River	2								2
Manasquan River	1	3			1				4
Upper Barnegat Bay	2	1			1	2		1	7
Metedeconk River	3								3
Central Barnegat Bay		2							3
Toms River	3	1						2	6
Forked River								2	2

	MARINAS		CONDOS		PENDING	APPEAL	VIOLATION	PUBLIC DOCKS	TOTAL
	C	U	C	U					
Lower Barnegat Bay	1	1							2
Little Egg Harbor	1	2						1	4
Tucker-ton Creek		1			2			1	4
Great Bay				2	1				3
Absecon Bay	1	1						(1)[2]	2
Lakes Bay	1	2		1	2			1	7
Great Egg Harbor	2				3			1	6
Ludlams Bay					1				1
Town-sends Inlet	1							1	2
Hereford Inlet		2						1	3
Cape May Harbor		1							1
Delaware Bay		1							1
Maurice River	1				1			1[3]	3
Fortes-que Creek								1	1

	MARINAS		CONDOS		PENDING	APPEAL	VIOLATION	PUBLIC DOCKS	TOTAL
	C	U	C	U					
Delaware River	1	2							3
Upper Delaware							1	(1)	1
TOTALS	23	26	0	9	19	2	2	20	101

C = operation confirmed U = required but operation unconfirmed

(1) = public marina was also subject of a permit

In 1986, the New Jersey Sea Grant Program was able to identify 13 operational and publicly accessible MSD pumpout facilities at traditional marinas (Tiedemann, 1987). As of October of 1988, a total of 23 publicly accessible MSD pumpout facilities were known to be on line, a 75 percent increase over 1986. An additional 35 pumpouts may be operational now or in the near future, as a result of permit conditions. Adding to these the pending applications and public marinas, as many as 101 pumpout facilities may exist in the foreseeable future.

The 1988 Marine Sewage Treatment Act also mandates that the DEP investigate the treatment and disposal of collected wastewater. Information is currently available for 22 of the existing pumpout facilities. As additional pumpout facilities are put into operation, the Division is requesting that the method of sewage treatment be specified.

METHOD OF TREATMENT FROM EXISTING PUMPOUTS

Treatment Type	System	Type	
	Marina Wide	Portable	Total
Public Sewage Treatment Plants	13	3	16
Private Sewage Treatment Plants	1	0	1
Licensed septage hauler	2	3	5
Septic system	0	0	0

(source: Tiedemann 1988)

The discharge of sewage into a public sanitary sewage system simplifies the tracking of the treatment and discharge as required by the 1988 Marine

Sewage Treatment Act. In these cases only the sewer service area must be identified. Where licensed haulers are employed the waste is introduced into a sewage treatment plant; however the particular plant is not specified by the DEP as part of the license.

Mr. Tiedemann surveyed marina owners and operators to determine how they were handling portable toilet wastes. Answers ranged from a dedicated location with a special collection device, (11%), to a dedicated restroom stall (44%), to allowing emptying into the restroom without promoting the practice (41%), to requiring the boat owner to take it home (4%).

The optimal situation is to provide a location equipped with a specially designed collection device. Restroom stall usage is often quite messy and a continual maintenance headache for the marina operator. Requiring the boatowner to remove the waste and carry it home is the worst scenario. The inconvenience of this method coupled with possible spillage during emptying is likely to encourage overboard discharge.

IV. Demand for Pumpouts in New Jersey

The most difficult element of this study is producing a reliable estimate of demand. Since January 30, 1980, all vessels over 65 feet in length has been required to install a Type II or Type III marine sanitation device (MSD). Vessels 65 feet or less are required to install a Type I, II or III MSD only if they have a permanent head on board. Unfortunately there does not appear to be any good data indicating which boats under 65 feet have permanent heads and where those boats are located.

The US EPA estimated that 20 percent of the vessels from 16-26 feet, 50 percent of the vessels from 26-40 feet and all vessels over 40 feet are equipped with an MSD (US EPA, 1981).

The New Jersey Division of Motor Vehicles (NJ DMV) lists 187,000 registered boats in New Jersey, but was unable to break this number down by vessel size, method of locomotion or location (Torlini, Pers. Comm.). The N.J. Marine Police annual report to the U.S. Coast Guard reported 150,125 vessels in New Jersey's 1987 registered fleet (USCG, 1987). These latter figures are extrapolated from earlier data which accounts for the discrepency in the totals; however since these figures are broken down by vessel size they are used in all following calculations.

N.J. Recreational Boating Fleet 1987

under 16 feet	62,033
16-26 feet	76,727
26-40 feet	10,723
40-65 feet	597
over 65 feet	45
TOTAL	150,125

(source: Nat'l. Marine Manufacturers Assoc. as reported to U.S. Coast Guard 1987 and confirmed by N.J. Marine Police)

Utilizing the US EPA formula, a total of 21,348 vessels are expected to have MSDs or 14 percent of the total New Jersey fleet. This figure is comparable to studies conducted in North Carolina and Long Island which found 8-10 percent of the total fleet were equipped with MSDs, (Rogers S. and Abbas L. 1982; Tanski, 1988).

The New Jersey Marine Trades Association assumes vessels from 18 to 25 feet are most likely to employ portable toilets. The figures secured from the National Marine Manufacturers Assn. define a class of vessels from 16 to 26 feet. The DEP cannot predict the number of vessels between 18 and 25 feet with accuracy; therefore certain assumptions have been made to allow a discussion of the usage of portable toilets.

First, we assume that half of the vessels in the 16 to 26 foot range are using either an MSD or portable toilet. This calculation allows for the

elimination of 16 to 18 foot craft which fall outside of the definition as well as those vessels 18 feet or over which do not have cabins, (which makes the use of a portable toilet indiscrete and unpractical). Secondly, all vessels over 26 feet are assumed to use either an MSD or portable toilet.

ESTIMATED DEMAND FOR SEWAGE COLLECTION

Vessel Class	# of Vessels Total	# of Vessels w/MSD (US EPA)	# of Vessels w/portable toilets
under 16 feet	62,033	0	0-0
16 to 26 feet	76,727	15,345	23,018
26 to 40 feet	10,723	5,361	5361
40 to 65 feet	597	597	0
over 65 feet	45	45	0
TOTALS	150,125	21,348	28,379
% of Total	100%	14%	19%

It should be noted that some undefined percentage of the 28,379 vessels utilizing portable toilets are undoubtedly docked in close proximity to the owner's residence; not requiring access to an emptying receptacle at a marina. Pumpout facilities, on the other hand, are relatively costly, and are not likely to be purchased by a private party; therefore it is expected that all equipped vessels will seek a facility available to the public.

Usage data from the existing pumpout facilities has been compiled by John Tiedemann from a survey conducted of 16 marina operators. In general, the usage of those facilities was lower than expected in 11 cases, one marina reported moderate usage, and four marinas reported relatively high usage (Tiedemann, 1988). Considering the low number of pumpouts on line, these figures are particularly disappointing.

Pumpout Facility Usage

# of Marinas	# of uses per season 5/88 - 9/88
3	0
5	10
3	30
1	80
2	240
2	350

(source: Tiedemann 1988)

V. Conclusion

The intent of the 1988 Marine Sewage Treatment Act is clearly to reduce if not eliminate the discharge of sewage from watercraft into New Jersey's coastal waters by making MSD pumpout facilities and portable toilet emptying receptacles available to the boating public. The Department of Environmental Protection, through the Division of Coastal Resources, has attempted to address this source of pollution since 1986 through Waterfront Development Permits.

Since that time, the Division has required pumpout facilities at 48 new or expanded marinas, and 19 other pending applications if approved will also require pumpout units. When added to the 14 pumpouts known to be operational without permit requirements and the twenty publicly owned or operated marinas which will be required to provide pumpout facilities under this Act, a total of 101 pumpout units could be expected to be on line in the foreseeable future. This would be a dramatic improvement over the 13 pumpouts on line in 1987.

Applying a goal projected by the USEPA of one pumpout per 200 vessels equipped with an MSD, (US EPA, 1985) this total falls only six short. However, this formula is not considered sufficient by the US EPA for approving "No Discharge" designations because it fails to consider the basic requirements of pumpout usability: location, cost, and accessibility.

The US EPA evaluates "No Discharge" applications under the following general standards: 1) the maximum distance from port to pumpout is not more

than one or two miles; 2) the pumpout must be readily accessible; 3) the maximum wait expected for peak usage, (eg. Fourth of July weekend in the evening) is not more than 15 minutes; and 4) the cost is not prohibitive, not more than $20 (Amson, pers. comm.). These four criteria are the keys to making pumpout units available to all boaters.

An analysis of the 101 existing and proposed pumpout locations reveals that large reaches of, and entire waterways would remain unserviced. This is partially attributable to the lack of direction afforded by a process which relies on permit applications for pumpout placement.

Presently, there are only 23 known pumpout units servicing New Jersey's coast; consequently there are few candidate waterbodies which could qualify for "No Discharge" designation under the adequate sewage collection and treatment provisions of the US EPA. The only areas possibly providing adequate pumpout facilities are the Shark River, Morris Canal Basin (designation pending before the US EPA), the Metedeconk River, and Toms River.

In spite of the relative scarcity of pumpout facilities, many of those in operation exhibit extremely low usage. This is attributable to either poor access, high cost, or indifference on the part of the boater. A successful program aimed at reducing overboard discharge must comprehensively address these issues, as well as simply provide more pumpouts.

VI. Options

In order to increase the availability and use of sewage collection facilities on New Jersey's coastal waters, the Department of Environmental Protection is considering a variety of options which are described below. The Department will provide the Legislature with more definitive recommendations in a subsequent report required by Section 4 of the Act to be submitted by May 1.

More definitive information relative to MSD equipped vessels and portable toilet users is desirable. Two techniques of gaining this information are to survey registered boat owners or to conduct extensive field reconnaissance. While the time required to assemble and analyze the data precludes its use in an expedent solution to the pumpout shortage, this information is necessary to evaluate the effectiveness of any remedy to the watercraft sewage disposal problem.

Possible immediate actions to decrease the amount of marine generated sewage discharge into near shore water are explored below.

1) Continue to require pumpout units as conditions of DEP permit approval with certain modifications to help speed the process. The advantages to this process are that no new regulation would be needed and that the permit applied for would serve as an incentive to provide the pumpout unit. A possible modification to the process would require pumpouts to be located at marinas which are applying for maintenance dredging or dock repair permits. Such a requirement this would have added 77 additional

pumpouts since 1986. Since dredging and dock repair work allows a marina to continue to operate, and to continue to affect coastal waters, this requirement is not entirely unreasonable.

The disadvantages of this process are that it remains slow and it does not allow the Department to specify where pumpout facilities are required.

2) Require pumpout facilities at every marina which provides dockage to vessels equipped with an MSD. This is the approach taken by the State of Delaware in legislation enacted in the summer of 1988.

The advantage to this strategy is that it puts pumpouts in marinas where the vessels in need of those facilities are located. The disadvantages are that it is very difficult to enforce this regulation, owing to the mobility of vessels and the fact that those vessels may not dock at the same marina every year. In addition, this approach does not consider those vessels moored behind private homes. If no MSD-equipped boat is docked at a marina in the same watershed, private owners will have no facility at their disposal.

This option would require additional legislation.

3) Require pumpout facilities at all marinas which provide fueling facilities for boats. This option is based on the premise that the vessels equipped with MSDs are relatively large, generally do not have removable fuel tanks, and are, therefore, relegated to fuel in the water. There are approximately 250 marinas in New Jersey which provide fuel. Located on

virtually every waterway in the state (BA, 1987). Where several marinas providing fuel are located in close proximity, a provision could be made allowing those operators to jointly fund and operate a pumpout facility, avoiding unnecessary duplication of facilities.

Advantages of this option are that fueling facilities are relatively stationary providing for easier enforcement, most provide an attendant who could oversee the facility's use and assist boat owners, and fuel docks are easily accessible to large craft.

The major drawback of this proposal involves sailing vessels which may not require in-water fueling, requiring those vessels to go out of their way to access a pumpout facility. It is unlikely under this scenario, however, that such a trip would take the captain more than one mile off course.

4) In addition to siting adequate pumpout facilities in useful and useable locations, consideration should be given to requiring these facilities to be open to transient vessels and keeping the cost to would be users reasonable. The State may wish to subsidize the initial cost of purchase and installation of the facilities which would not only ease the financial burden on the marina owner, but would also provide a mechanism whereby the State could oversee the pumpout location, require the facility to be available to transient boaters and keep the price per use reasonable.

5) Live-aboard vessels provide overnight residence to its occupants thereby having a productivity to generate greater volumes of waste than recreational boats. Without the provision of continuous sewer service to

these vessels, the incidence of overboard disposal is expected to increase. All marinas providing live-aboard arrangements may be required to provide continuous or regular interval slipside pumpout service.

6) Since, as a matter of convenience, many boat owners will empty portable toilets overboard rather than transport the waste home and a substantial number of boaters utilize portable toilets, each marina should provide a dedicated location for the emptying of portable toilets. It may be left to the marina operator's discretion whether a restroom stall is dedicated or a special collection device is installed, as it is ultimately the marina operators who are responsible for maintaining their bathrooms.

7) The requirement for public restrooms at all new or expanded marinas should be continued. This requirement may be applied to condominium docks as well as to traditional marinas, since there are undoubtedly incidents where slip space is sublet or friends not possessing a key to the home will use the dock. Restrooms should be provided in proportion to the number of slips available.

8) Due to the obvious difficulty in enforcing sewage disposal regulations and the manpower such an effort would demand, there is an acute need for public education in this area. Boaters should be informed of the locations and operation of pumpout facilities and portable toilet emptying locations as well as the environmental degradation produced by overboard disposal. The Department should work with the New Jersey Marine Trade Association, New Jersey Sea Grant and others to create a brochure for

distribution at marinas and with boat registration forms. Such a campaign should enhance the use of sewage collection facilities.

9) The DEP's Division of Coastal Resources should continue to enforce previously issued permits requiring pumpout facilities to ensure those facilities are on line prior to new slip occupation.

10) The State should consider prohibiting the installation of "Y" valves on vessels equipped with Type III MSDs which allow the discharge of untreated sewage into New Jersey's coastal waters. This would require new Legislation.

11) The DEP should continue to pursue the application to the US EPA for the designation of the Morris Canal Basin as a "No-Discharge" area under the Clean Water Act. The DEP should also continue to assess all waters of New Jersey to determine which require greater water quality protection, and apply to the US EPA for a "No-Discharge" designation to afford that protection.

The DEP will continue to explore these and other ideas in consultation with the New Jersey Marine Trades Association, the New Jersey Sea Grant Marine Advisory Service, the U.S. Environmental Protection Agency and all interested citizens. Specific plans for administrative action and recommendations for legislative actions aimed at reducing the impact of boating on water quality will be presented in a subsequent report to the Legislature as required by the 1988 Marine Sewage Treatment Act before May 1, 1989.

The Department welcomes comments and suggestions on this issue. Please respond to:

New Jersey Department of Environmental Protection

Division of Coastal Resources

CN 401

Trenton, New Jersey 08625

Attn: Lawrence Baier

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Kenton Pers. Comm. - Mr. William Kenton, owner, KECO Inc., pumpout unit manufacturer, San Diego, CA, personal communication

Laurita Pers. Comm. - Mr. John Laurita, Acting Section Chief, NJ DEP Division of Water Resources, Bureau of Municipal Waste Management
Trenton, NJ, personal communication

Mueller Pers. Comm. - Mr. Gell Mueller, NJ DEP Division of Solid Waste Management, Registration and Permits
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O'Malley Pers. Comm. - Ms. Marria O'Malley, U.S. Environmental Protection Agency, Anapolis, MD, personal communication

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Torlini Pers. Comm. - Mr. Rudolph Torlini, Assistant Director, NJ Division
of Motor Vehicles, Trenton, NJ, personal communication

Uzar Pers. Comm. - Mr. Doug Uzar, Envirovac Inc., Slipside pumpout manufacturer
Rockfield, IL, personal communication

APPENDIX 1

PUMPOUT FACILITY KEY

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	HUDSON RIVER/NEW YORK HARBOR	
0)	Arcorp Properties Pershing Road Weehawken, NJ 07887	84-0798-1 Hudson River
1)	Newport City Newport Assoc. Development Co. 2 Sixth Street Jersey City, NJ 07302	86-0780-1 87-0001-1 Hudson River
2)	Harsimus Cove South c/o National Bulk Carriers 1345 Avenue of the Americas New York, NY 10105	86-0695-1 (pending) Hudson River Luis Munoz Marin Boulevard Jersey City
3)	Harborside Financial Center c/o Exchange Place Ltd. Partners 34 Exchange Place Jersey City, NJ 07302	87-1006-1 (pending) Hudson River
4)	Liberty Harbor Marina 100 Marin Boulevard Jersey City, NJ 07302	86-1015-1 (confirmed) Morris Canal Basin
5)	Liberty Park Marina Liberty State Park Jersey City, NJ 07302	88-0121-1 (pending) Morris Canal Basin
	RARITAN RIVER	
6)	Aqua Marine Development Inc. P.O. Box 1122 New Brunswick, NJ 07901	88-0352-1 (pending) Highland Park Raritan River Donaldson Street

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	RARITAN BAY	
7)	Twin Towers Marina Wagner, Michael & Joan 165 Cliffwood Avenue Cliffwood, NJ 07721	86-0154-1 483 Amboy Road Aberdeen on Matawan Creek
8)	Gateway Marina 5 Port Monmouth Road Port Monmouth, NJ 07758	(confirmed) none Pews Creek
	SANDY HOOK BAY	
9)	Highlands Condo Assn. 68 5th Street Highlands, NJ 07732	87-0897-1 Sandy Hook Bay Condo's
	SHREWSBURY RIVER	
10)	Skipper's Landing Alfonso, Grace & Mark Scerbo 52 Shrewsbury Avenue Highlands, NJ 07732	87-0468-1 Shrewsbury River
11)	Gaiter's Restaurant/ Scudiery Enterprises Airport Plaza, Highway 36 Hazlet, NJ 07730	88-0286-1 (pending) Ocean Avenue Sea Bright on Shrewsbury River Condo's
12)	Long Branch Ice Boat & Yacht Club Renwick Place Long Branch, NJ 07740	88-0402-1 (pending) Manhassett Creek
13)	Seawinds Boatowners Assn. 31 Sunset Avenue Long Branch, NJ 07740	87-0743-1 Shrewsbury River Condo's

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	NAVESINK RIVER	
14)	Shrewsbury River Yacht Club P.O. Box 85 Fair Haven, NJ 07701	87-0108-1 (pending) 925 River Road Fair Haven on Navesink River
15)	Monmouth Boat Club Union Street Red Bank, NJ 07701	86-1028-1 Navesink River
16)	Assoc. at the Bluffs 68 West Front Street Red Bank, NJ 07701	86-1027-1 Navesink River Condo's
17)	Shrewsbury Manor Inc. P.O. Box 757 Red Bank, NJ 07701	86-1030-1 Navesink River Condo's
18)	Mara Vista Condo Assn. 130 Bodman Place Red Bank, NJ 07701	86-1029-1 Navesink River Condo's
19)	Bodman Arms 138 Bodman Place (Bodman Arms) Red Bank, NJ 07701	86-1031-1 Navesink River Condo's
20)	Molly Pitcher Assoc. 88 Riverside Avenue Red Bank, NJ 07701	87-0052-1 Navesink River
21)	Sullivan Partnership (Oyster Point) 151 Bodman Place Red Bank, NJ 07701	86-0092-1 Violation 7/20/88 Navesink River

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	SHARK RIVER	
22)	Seaview Marina Condo Assn. Sea Spray Lane & Rte. 35 Neptune, NJ	87-1257-1 (confirmed) Shark River
23)	Belmar Marine Basin Rte. 35 & Marina Avenue Belmar, NJ 07719	(confirmed) Shark River
	MANASQUAN RIVER	
24)	Brielle Yacht Club 201 Union Lane Brielle, NJ	(confirmed) Manasquan River
25)	Northeast Sport Fishing 602 Green Avenue Brielle, NJ 08730	87-0713-1 Point Pleasant Beach on Wills Hole Thorofare
26)	New Jersey Yacht Club P.O. Box 1009 Pt. Pleasant Beach, NJ 08742	88-0166-1 Manasquan River
27)	The Mooring Rt. 70 & River Road Pt. Pleasant, NJ 08742	88-0248-1 (pending) Manasquan River
28)	Sportsman's Island Marina (Shoremarine) Barnegat Bay Assoc. Painter's Ridge Prof Plaza, Rt. 34 P.O. Box 418 Brielle, NJ 08730	87-0548-1 Riverside Drive Brick on Manasquan River

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	UPPER BARNEGAT BAY	
29)	Bay Point Harbor (Johnson Bros.) Bay Avenue Pt. Pleasant, NJ 08742	(confirmed) Barnegat Bay
30)	Pelican Cove c/o Trendor Corp. 2133 Bridge Avenue Pt. Pleasant, NJ 08742	86-0279-1 (appeal) Brick Township on Barnegat Bay
31)	Winter's Yacht Basin 5 Mantaloking Road W. Mantaloking, NJ 08738	(confirmed) Barnegat Bay
32)	Deauville Landing 134 Evergreen Pl. East Orange, NJ 07018	87-0271-1 (appeal) Brick Township on Ellis Tide Pond
33)	Ocean Beach Marina 3245 Route 35 Lavallette, NJ 08735	87-0133-1 Lagoon off Barnegat Bay
34)	Bayberry Cove Condominiums 1901 Bay Boulevard Ortley Beach, NJ 08751	88-0464-1 (pending) Barnegat Bay Condo's
	BEAVER DAM CREEK/METEDECONK RIVER	
35)	Arnolds Yacht Basin 1671 Beaverdam Road Pt. Pleasant, NJ 08742	(confirmed) Beaver Dam Creek
36)	Wehrlen Brothers Marina 197 Princeton Avenue Brick Town, NJ 08723	(confirmed) Metedeconk River

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
37)	Masthead Marina Rt. 70 & Metedeconk Road Brick Town, NJ 08723	(confirmed) Medtedconk River
	CENTRAL BARNEGAT BAY	
38)	Good Luck Point Marina - Roy and Gail Voss Roy D. & Gail T. Voss P.O. Box 8 Ocean Gate, NJ 08740	86-0161-1 Lake Dorrance & Barnegat Bay
39)	Holiday Harbor Marina - Lange and Mahr Robert G. Lange & Joel Mahr 73 Tiller Drive Waretown, NJ 08758	85-0734-1 (confirmed) 88-0093-1 Marina Lagoon off Barnegat Bay
40)	Waretown Fishing Station - Slivoski Alan Slivoski 96 Bryant Road Waretown, NJ 08758	86-1092-1 Barnegat Bay
	TOMS RIVER	
41)	Fossal Corporation - Dillon's Creek Marina 16 River Bend Drive Toms River, NJ 08753	87-0520-1 (confirmed) Dillon's Creek & Toms River
42)	Trend Homes Inc. 2133 Bridge Avenue Pt. Pleasant, NJ 08742	86-0135-1 East Water Street Dover Township on Toms River

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
43)	Riverbank Marina 1 Corrigan Avenue P.O. Box J Bayville, NJ 08721	86-1068-1 (confirmed) Toms River
44)	Stump Creek Shipways 207 Chelsea Avenue Bayville, NJ 08721	(confirmed) Mill Creek off Toms River
	LOWER BARNEGAT BAY	
45)	Shore Marine - Barnegat Bay Assoc. P.O. Box 426 Marine Road & Bay Point Waretown, NJ 08758	86-0914-1 (confirmed) Lagoon off Barnegat Bay
46)	Lighthouse Marina 6th Street & Bay P.O. Box 705 Barnegat Light, NJ 08006	87-0653-1 Barnegat Bay
	LITTLE EGG HARBOR	
47)	Brant Beach Yacht Club 59th and Bayview Avenue Brant Beach, NJ 08050	86-0367-1 Little Egg Harbor
48)	Shelter Harbor Marina Harbor Wharf Inc. 317 11th Street Beach Haven, NJ 08008	86-0501-1 (confirmed) Little Egg Harbor
49)	Lands End Marina - Jim Garabo 102 Roosevelt Avenue Holgate, NJ 08008	87-1152-1 Little Egg Harbor

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	TUCKERTON CREEK	
50)	Hayes Marina - Howard Goheen 458 S. Green Street Tuckerton, NJ 08087	87-0339-1 (pending) Tuckerton Creek
51)	American Boat Exchange 470 S. Green Street Tuckerton, NJ 08087	87-0236-1 (pending) Tuckerton Creek
52)	Ultima Cove Marina 500 S. Green Street Tuckerton, NJ 08087	86-0519-1 Tuckerton Creek
	GREAT BAY	
53)	Morning Harbor Condos Center Street Associates 88 East Anchor Drive P.O. Box 422 Tuckerton, NJ 08087	87-0815-1 Playhouse Road & Captains Drive Mystic Islands - Sail Cove Lagoon off Great Bay Condo's
54)	Snell and Gilbert 227 Allen Street Tuckerton, NJ 08087	88-0312-1 87-0667-1 Radio Road - Mystic Islands Lagoon off Great Bay Townhouses
55)	Center Street Associates 88 East Anchor Drive P.O. Box 422 Tuckerton, NJ 08087	88-0374-1 (pending) Lagoon off Great Bay Condo's
	ABSECON INLET/BAY	
56)	The Harbour at Harrah's 1725 Brigantine Boulevard Atlantic City, NJ 08401	(confirmed) Absecon Channel

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
57)	Senator Frank S. Farley State Marina 600 Huron Avenue Atlantic City, NJ 08401	87-0879-1 Clam Creek

LAKES BAY AND THOROFARES

58)	Ross Constantino South Boulevard Atlantic City, NJ 08401	87-0224-1 Inside Thorofare w/Condo's
59)	Omnivest Consortium Cambridge & Monmouth Sts. Ventnor City, NJ 08406	87-0868-1 (pending) Inside Thorofare w/Apartments
60)	Crown Key Residential Yacht Club Lipman Trust 3 Penn Center, Suite 1510 Philadelphia, PA 19102	86-0763-1 Burk Ave. & Howard Ave. Ventnor on Beach Thorofare
61)	Holiday Marina - Joel Krantz 2503 Beach Drivedg Longport, NJ 08403	86-0202-1 86-0203-1 Margate Toll Bridge Beach Thorofare
62)	Mariner's Cove Marina P.O. Box 137 Northfield, NJ 08225	88-0646-1 (confirmed) Dock Thorofare
63)	Bay Club Marina c/o Bay Properties Co. Suite 3200 Willow Grove Plaza Willow Grove, PA 19090	86-0168-1 Amhurst Avenue, Margate Beach Thorofare

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	GREAT EGG HARBOR	
64)	Harbour Cove Marina Bay Avenue Somers Point, NJ 08244	(confirmed) Ships Channel
65)	Bennett Brother's Marina 49 Lakeshore Drive Manahawkin, NJ 08050	87-1289-1 (pending) Goll Avenue, Somers Point Ship Channel
66)	John Fenstermacher 115 Brindle Road Mechanicsburg, PA	88-0552-1 (pending) Bay Avenue, Ocean City Rainbow Channel
67)	Blackman's Marina c/o Meadowlands Corp. P.O. Box 612 Longport, NJ 08403	88-0286-1 (pending) Ocean Heights Ave. & Blackmans Rd. Egg Harbor Twp., NJ Patcong Creek
68)	All Seasons Marina 34th Street at Bridge W. Ocean City, NJ 08223	(confirmed) Peck Bay
	LUDLAM'S BAY	
69)	Minmar II Inc. P.O. Box 134 Sea Isle City, NJ 08243	87-0945-1 (pending) Old Sea Isle Boulevard Sea Isle City Ludlam Thorofare
	TOWNSENDS INLET	
70)	Harvey's Port of Call 10th & Ocean Drive Avalon, NJ	(confirmed) Cornell Harbor

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	HEREFORDS INLET	
71)	Reuter's Marina 329 West 20th Street North Wildwood, NJ 08260	87-0287-1 Beach Creek
72)	Wildwood Yacht Basin c/o Beach Creek Inc. 5304 Lake Road Wildwood, NJ 08260	88-0064-1 Schooner Island Rio Grande Ave. Wildwood on Grassey Sound
	CAPE MAY HARBOR	
80)	Harbor Town Resort, Inc. P.O. Box 2426 Cape May, NJ 08204	87-0892-1 86-0651-1 Ocean Drive, Lower Twp. Cape May Harbor Canal
	DELAWARE BAY-BIDWELLS CREEK	
73)	Cape May Marina Inc. - Gant's Marina KYD Enterprises P.O. Box 4163 Brick, NJ 08723	87-0398-1 Route 47 Middle Township on Bidwells Creek
	MAURICE RIVER	
74)	Sam's Ebb Tide Marina Samuel L. Veach Box 29 Heislerville, NJ	87-0125-1 (pending) Maurice River
75)	Spring Garden Marina Spring Garden Road Port Elizabeth, NJ 08332	87-0105-1 (confirmed) Maurice River

Key No.	Applicant/Owner Address	Permit (status) Location (if different) Waterway
	DELAWARE RIVER-DREDGE HARBOR	
76)	Riverside Marina Norman Avenue Riverside, NJ 08075	(confirmed) Dredge Harbor
77)	Winter's Yacht Basin P.O. Box 266 Reserve Avenue Riverside, NJ 08075	86-0576-1 86-0961-1 Dredge Harbor
78)	Truesdale Maine Corp. 847 Arnold Drive Pt. Pleasant, NJ 08742	87-1111-1 St. Mihiel Drive Delran on Dredge Harbor
	UPPER DELAWARE RIVER	
79)	Trenton Marine Sales 1501 Lamberton Street Trenton, NJ 08611	86-0275-1 Delaware River

PUBLIC MARINAS

KEY

a)	Liberty Park Marina Liberty State Park Jersey City, NJ 07032	
b)	Elizabeth City Marina Front Street at Elizabeth Avenue Elizabeth, NJ 07201 Arthur Kill	20 slips
c)	Woodbridge Municipal Marina Cliff Road Sewaren, 07077 Smith Creek off Arthur Kill	10 slips
d)	Perth Amboy Municipal Boat Basin Front Street Perth Amboy, NJ 08861 Arthur Kill	96 slips
e)	Township of Middletown Public Dock Port Monmouth Road Middletown, NJ 07748 Compton Creek off Raritan Bay	200' dock
f)	Leonardo State Marina 2 Concord Avenue Leonardo, NJ 07737 Lagoon off Raritan Bay	185 slips
g)	Atlantic Highlands Marina Foot of First Avenue Atlantic Highlands, NJ 07716 Sandy Hook Bay	120 moorings 315 slips
h)	Red Bank Municipal Basin Wharf Avenue, Marine Park Red Bank, NJ 07701 Navesink River	30 slips
i)	Seaside Park Municipal Ramp & Boat Basin 13th Street & Bayview Avenue Seaside Park, NJ 08752 Central Barnegat Bay	small boat moorings
j)	Toms River Municipal Boat Slips & Ramp Riverside Drive Toms River, NJ 08753 Toms River	15 slips

k) Island Heights Marina, Docks & Ramp
Island Heights, NJ 08732
Toms River — 20 slips/moorings

l) Forked River Township dock
Lacey Road
Forked River, NJ 08731
North Branch Forked River — 11 slips

m) Forked River State Marina
311 South Main
Forked River, NJ 08731
North Branch Forked River — 109 slips

n) Parkertown Public Dock
Brook Street
Parkertown, NJ
Parker Run off Little Egg Harbor — 98 slips

o) Tuckerton Municipal Docks
Scow Landing & S. Green Street
Tuckerton, NJ 08087
Tuckerton Creek — 30 slips

w) Senator Frank S. Farley State Marina
600 Huron Avenue
Atlantic City, NJ 08401 — 432 slips

p) Pleasantville Municipal Marina
Bayview Avenue
Pleasantville, NJ 08232
Lakes Bay — 85 slips

q) Atlantic County Bulkhead
River Road
Mays Landing, NJ 08330
Great Egg Harbor River — overnight docking

r) Avalon Bay Park & Ramp
Ocean Drive & 54th Street
Avalon, NJ 08202
Long Reach — 32 slips

s) Stone Harbor Municipal Marina
Foot of 81st Street
Stone Harbor, NJ 08247
Great Channel — 72 slips

t) Matts Landing - Fish, Game & Wildlife Land
Anchor Marina, Driftwood Marina
Matts Landing Road
Heislerville, NJ 08324
Maurice River — 267 slips

u) Fortescue State Marina
Fortescue, NJ 08321
Fortescue Creek — 125 slips

v) City of Trenton
Trenton Marine Sales
1501 Lamberton Street
Trenton, NJ 08611

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