SECTION XII

WATER RESOURCES POLICIES #30-40, 44

A. INTRODUCTION

This section of the LWRP comprises twelve policies that address surface waters, wetlands and groundwater protection.

Water resources, both groundwater and surface waters, have been a critical focus of the LWRP. As an island waterfront community, existing on a sole-source aquifer and bounded on three sides by marine environments crucial to its resort and commercial fishing economy, East Hampton Town has an overwhelming interest in preserving and protecting its water resources.

Early development paid little attention to water resources, which originally must have seemed limitless. However, as development has increased, abundant supplies of pure drinking water can no longer be taken for granted, and formerly pristine harbors have had shellfish closures imposed because of pollution.

Ensuring a viable future of clean drinking and surface waters will be difficult. Groundwater must be carefully monitored, as pipelines carry water from one end of the Town to the other to alleviate shortages, maintain quality, and address salt water intrusion in low-lying areas. Increasing numbers of new golf courses, swimming pools and other high-volume users may contaminate or deplete groundwater tables, and stress on local aquifers is unlikely to diminish.

Non-point sources of pollutants enter ground and surface waters from septic systems, road and agricultural run-off, boats and other sources. They must be halted or mitigated to reverse the progressive trend of shellfish closures, wetland degradation, decreasing finfish populations, algal blooms and a perceived decline of recreational attractiveness. Remediation of polluted groundwater and surface waters, restoring damaged wetlands and terrestrial and marine ecologies, are daunting tasks. Yet they must be undertaken to avoid even more costly and complex solutions in the future.

This report surveys the Town's water resources and suggests policy initiatives to further these objectives. It includes an Inventory and Analysis of the extent, function and importance of the Town's surface water, wetland and groundwater resources within the waterfront study area. Existing standards and legislation for protecting water resources are inventoried, as are present sources of pollution and pollution abatement efforts. Results and recommendations of a 1990 boater and marina survey conducted as part of the LWRP were also used in preparing the report.

The Town is putting great effort and substantial resources into improving water quality. Several LWRP recommendations have been implemented or are in the process of being translated into local law or new initiatives. A *Harbor Protection Overlay District (HPOD)* was adopted in 1995 to reduce pollutants entering harbors (Appendix C). A bill is being considered for the State Legislature to permit localities to offer tax abatement incentives for pollution related improvements to private property. The Town applied for a *No-Discharge Zone* in July 1997 to reduce boat pollution in the enclosed harbors, and is pursuing a variety of non-point pollution abatement projects to reduce road run-off and other overland and subsurface pollutants.

These and other initiatives will continue as part of the LWRP implementation (see **Projects**).

B. SURFACE WATERS, TIDAL AND FRESHWATER WETLANDS, TOWNWIDE OVERVIEW

1. Distribution and site types

The Town of East Hampton is surrounded on three sides by water: the Atlantic Ocean to the south, Block Island Sound to the east and Gardiners Bay, Napeague Bay and Block Island Sound to the north, as the easternmost extension of the Peconic/Gardiners Bay system. There are 69 miles of outer coastline and 36 miles of protected harbor shorelines. In addition, the numerous coastal embayments, lagoons and creeks create vast tidal and freshwater wetland systems.

Several surface water and wetland systems exist throughout the Town. Of the twelve site types identified in the Comprehensive Plan (see **Significant Habitats Policy #7**), four of them, *Estuarine, True Groundwater Table Pond, True Groundwater Table Streams, and Perched Water Table*, are directly related to surface water, freshwater wetland and tidal wetland systems. Two others, *Moorlands and Downs*, are commonly associated with seasonal ponds and wetlands.

With the exception of Georgica Pond, and the water bodies located on Gardiners Island, *Estuarine* site types are distributed mainly along the north shore. Some of the more extensive *Estuarine* waters, from west to east, include: Northwest Harbor and Northwest Creek, Gardiners Bay, Three Mile Harbor, Accabonac Harbor, Napeague Bay and Napeague Harbor and Lake Montauk. *Groundwater Table Ponds* and *Perched Water Table* ponds are dispersed throughout the Town and include: Wainscott Pond, Scoy Pond, Fresh Pond (Hither Woods), Fort Pond, Tuthill Pond, Big Reed Pond and numerous smaller ponds. Brackish and fresh *Groundwater Table Ponds and Streams* may be located farther inland from coastal systems, but are related hydrologically to the current or former shoreline.

Tidal Creeks are distributed in much the same manner as the estuarine waters. They are located mainly along the north shore of the Town with extensive distributions in Northwest Creek, Alewife Brook, Accabonac Harbor, Three Mile Harbor, Napeague Harbor and Lake Montauk. These systems are made up of littoral zones, coastal shoals, mud flats and salt marshes and are subject to tidal flow twice a day.

Fresh Ponds, Coastal Ponds, Streams, Springs and Seeps are linked to both the saltwater/tidal interface and to the underground aquifers, the sole source of drinking water for the Town. *True Groundwater Ponds*, including *Fresh Ponds and Coastal Ponds,* and *True Groundwater Table Stream* systems occur throughout the Town in low lying depressions in the immediate coastal environment. *Perched Water Table* systems occur over areas of impermeable clay deposits.

The New York State Department of Environmental Conservation (NYS DEC) has identified tidal and freshwater wetland boundaries according to the Tidal Wetlands Act (Article 25 of the NYS Environmental Conservation Law) and the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law) respectively. Wetlands are found in all twelve reaches of the Town. Their characteristics and dominant vegetation are defined in Table 1, and their locations

noted on Map XII-1. Note that additional categories, brackish meadows (Johnson, 1985), floating aquatic, and seep communities are defined in Table 1 to include other systems not defined by NYS DEC, but found in the Town.

Maps that describe the distribution of these wetland systems are referenced in each reach discussion. These maps were produced in various Town and County studies of the watersheds in each reach. In addition to these studies, the reader is referred to the NYS DEC Tidal and Freshwater Wetland Inventory Maps and to the Department of the Interior National Wetland Inventory, presented on Map XII-1.

2. Function, Importance and Use

The Town's surface waters link wetland and upland habitat, and support a myriad of biological activity. Wetland systems are tremendously fertile and productive habitats. Their ability to filter pollutants, recycle nutrients, produce primary food sources and shelter breeding and larval marine life is essential to the coastal food chain. Numerous endangered, threatened and special concern species identified by state and federal agencies depend on the Town's aquatic and wetland habitats (see **Significant Habitats Policy #7**).

Inner harbors and coastal embayments connect the wetland systems to the oceans and sounds surrounding Long Island. These coastal environments are characterized in *Aquatic Site Types* in **Significant Habitats Policy #7.** Such systems also provide the pathways for nutrients, plant and animal organisms to circulate, and buffer wetland and upland habitat from the direct influences of storms.

Table XII-1: Local Wetland Types

WETLAND TYPE	CHARACTERISTICS
MARINE	
Intertidal Marsh	lies between daily tides dominant vegetation: salt marsh cord grass *(Spartina alterniflora)*
High Marsh Wetland	just inland of tidal fluctuation, only inundated by Spring tides dominant vegetation: saltmarsh hay *(Spartina patens)*
Formerly Connected Wetlands	roadways or impoundments block normal tide flow marine plant community often infiltrated by common reed *(Phragmites communis)*
Brackish Meadow	slightly higher margins of salt marsh to dune heath grassy community dominated by switch grass *(Panicum virgatum)*, other species

FRESH	
Coastal Freshwater Marsh	transition zone where tidal species are interspersed among freshwater wetland vegetation typical vegetation: freshwater cord grass *(Spartina pectinata)*
Emergent Freshwater Marsh	standing water/waterlogged soils near edges of freshwater surface waterbodies rich diversity of species; e.g. *Typha* and many others.
Flooded Deciduous	flooded or saturated soils or open water with deciduous trees and/or shrubs (often occurs behind salt marsh as well) predominant vegetation: red maple, tupelo, swamp azalea, sweet pepperbush
Cranberry Bog	acidic, oxygen depleted "peaty" soil bog mat vegetation, predominant species include cranberry and red maple
Floating Aquatic	pond and sluggish streams with floating and/or submergent vegetation *(Nymphaea, Nuphar)*, water lilies
Seep Communities	groundwater seepage along banks or bluffs *Juncus, Equisetum,* speckled alder, iris

The Town's waters support valuable commercial and recreational fin and shellfisheries, and also serve as breeding and nursery grounds that provide an essential link in the marine food chain. The local fishing industry is of county, state and national importance, and all levels of government endeavor to conserve and maintain the resource. East Hampton and New York State cooperate through the Town Shellfish Hatchery and its restocking program to maintain hard clam, oyster and scallop populations in Town waters and the State waters of the Peconic Estuary (see **Commercial Fishing Policy #10**).

New York State has included many of the Town's surface waters in the list of State Significant Coastal Fish and Wildlife Habitats (see **Significant Habitats Policy #7**). Other unique attributes of Town waters include alewife spawning areas, harbor seal "haulout" areas, a smallmouth bass fishery, and a blue claw crab fishery.

Surface waters support several sectors of the Town's economy. In addition to their food chain importance, the Town's waters provide safe harbors and moorings for the commercial and recreational fishing and boating fleets. The Town's resort status also fuels popular waterborne recreational activities like boating, swimming, windsurfing, and surfing (see **Public Access and Recreational Resources Policies #9 & #19-22**).

3. Standards and Legislation

Legislation exists at the Town (Zoning, Natural Resource Special Permit, Site Plan Review, Subdivision Review, Trustee Review); County (Health Services, Planning Commission); State (Wetlands Permits, Coastal Erosion Hazards Area Permits, Environmental Quality Review, Waterfront Revitalization consistency review); and Federal (Army Corps of Engineers permits)

levels to protect surface waters and wetlands. However, with increasing development pressure the quality and quantity of surface water and wetland resources are becoming increasingly compromised.

NYS DEC has classified the marine and fresh waters of the state according to their potential best usage, has adopted water quality standards for each classification, and has identified Priority Water Bodies. Table 2 summarizes these water quality standards. These classifications are referenced in the discussion of surface waters for each Reach, and are denoted on Water Resources Maps XII-2A/-2B. NYS DEC has a coliform testing program used to maintain water quality standards under the National Shellfish Sanitation Program (NSSP), discussed below.

Permit review procedures are intended to ensure that designated standards are maintained. However, many pollution sources predate the review procedures, variances can be obtained, and violations are not uncommon. NYS DEC often issues permits for uses incompatible with the assigned water quality classification, e.g. intensive resort development or excessive residential dock construction in SA waters. In addition, non-point discharges of pollutants are difficult to control.

Table XII-2: NYS DEC Water Quality Classifications

CLASSIFICATION	
FRESH WATER	***BEST USAGE***
AA	source of water supply for drinking, culinary or food processing purposes and any other usages.
A	source of water supply for drinking, culinary or food processing purposes and any other usages.
B	primary contact recreation and any other use except as a source of water supply for drinking, culinary or food processing purposes
C	suitable for fishing and fish propagation; the water quality shall be suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose.
D	secondary contact recreation, but due to intermittent of flow, water conditions not conducive to propagation of game fishery; stream bed conditions will not support the propagation of fish.

MARINE WATER	***BEST USAGE***
SA	fishing, primary and secondary contact recreation and shellfishing for market purposes; water quality standards are the highest for any marine waters
SB	primary or secondary contact recreation and any other use except for the taking of shellfish for market purposes.
SC	fishing; not suitable for primary contact recreation or shellfishing; dissolved oxygen standards are the same as SA; permissible coliform levels substantially higher than for SA
SD	all waters not primarily for recreational purposes, shellfish culture or the development of fish life and because of natural or manmade conditions cannot meet the requirements of these uses

Classes are defined according to best usage

Primary contact recreation examples: swimming, diving, surfing

Secondary contact recreation examples: fishing, boating

4. Pollution Sources and Abatement Efforts

(a) Water quality overview

While the Town contains an abundance of intact wetland systems and arguably the cleanest surface waters on the East End, overall water quality has deteriorated, as indicated by numerous area closures to shellfishing. Shellfish closures due to coliform bacteria contamination, as of January 1998 have removed 36% of the Town's harbor bottomlands from the shellfish resource base (see Table 3, and Water Resources Maps XII-2A/-2B). As pollution increases, these ecosystems are under increasing stress and their ability to maintain equilibrium is decreased. Pollution abatement projects, described below and in **Projects**, have begun to reverse this trend, and some improvements to water quality have been detected.

However, another stress on shellfish populations has been the Brown Tide, an algal bloom of *Aureococcus anophagefferens* which decimated the bay scallop population and eelgrass beds from the mid-80's through the mid-90's. Although the Brown Tide has not returned consistently every year and some harbors have been reseeded with scallops, the harvest has not recovered. Although extensive research has been undertaken, the causes of Brown Tide have not been established and future events may well recur.

Table XII-3: Areas Closed to Shellfishing due to Coliform Bacteria Contamination Town of East Hampton, January 1998

Reach	Waterbody	Total Acreage	Closure	%
1	Sag Harbor	50	50 acres year round	100%
1	Northwest Creek	137	59 acres year round 78 acres conditional harvest	43% 57%
1	Alewife Creek	32	32 acres year round	100%
2	Three Mile Harbor (incl Hands Creek)	1025	10 acres year round 352 acres seasonal	1% 34%
2	Hog Creek	37	3 acres seasonal	8%
3	Accabonac Harbor	310	10 acres year round 102 acres seasonal (incl some conditional)	3% 33%
3	Fresh Pond	12	12 acres year round	100%
4	Devon Yacht Club	3	3 acres seasonal	100%
4	Napeague Harbor	885	0	0%
6	Lake Montauk	1085	150 acres year round 130 acres seasonal	14% 12%
7	Oyster Pond	115	115 acres year round	100%
11	Georgica Pond	350	350 acres year round	100%
	TOTAL	**4,041.0**	**788 acres year round** **668 acres seasonal or conditional** **1456 Total acres**	**19%** **17%** **36%**

Source: NYS DEC

There is considerable debate and uncertainty over specific causes of the algal bloom and increased concentrations of coliform bacteria. Non-point sources of pollution and nutrients are by definition diffuse, diverse and, upon release, can undergo complex interactions that are poorly understood. Nitrogen loading in particular has been identified as a primary ingredient in surface water degradation.

A number of these interactions are being studied as part of the Peconic Estuary Program (PEP, see below), and new standards are expected to be presented in the Comprehensive Conservation and Management Plan (CCMP). Brown Tide has been a principal concern of the PEP and a Brown Tide initiative is bringing together research efforts of several institutions and levels of government.

Within the Town, a number of pollutant sources have been identified: leaking fuel storage tanks, waste leachates, pesticides, fertilizers, stormwater runoff, chemical residues from treated wood structures, siltation, faulty septic systems and boats. Boat wastes include: human wastes, paints, cleaners, fuel and petroleum derivatives. More visible and region-wide threats include ocean current-borne medical and other waste, and the sewage treatment plant (STP) effluent that enters the

Peconic/Gardiners Bay system from point sources at the following six facilities: Brookhaven National Lab, former Grumman Aerospace at Calverton, Riverhead Town, Sag Harbor Village, Shelter Island Heights Association, and Plum Island Animal Disease Center. The Sag Harbor STP is probably the most immediate point source of nutrient loading for Town waters, affecting Northwest Harbor in Reach 1.

The surface water quality programs described below cover only some of the known sources of pollutants. The ability to test for all pollutant parameters, or to determine precise pollutant sources is limited by insufficient resources. Town efforts to control surface water pollutants are not intended to place blame or emphasize particular sources, but to identify programs and the best available technology to improve water quality townwide. For example, the amount of discussion about boaters in this report does not imply they have a proportionately larger impact on surface water quality, but simply that there are readily available means to remediate boating impacts.

(b) Coliform bacteria analysis

Coliform bacteria derive from decaying organic matter, soil, and feces contributed by plants, wildlife and humans. Septic systems, the most common source of human fecal coliform bacteria, use surrounding soil to filter out contaminants. When septic systems are too near wetlands or surface waters (horizontally), or the vertical distance to groundwater is insufficient, they do not adequately filter contaminants and act as sources of coliform pollution. Coliform bacteria counts are used as an indicator for pathogens.

The National Shellfish Sanitation Program (NSSP) defines acceptable bacteria levels for waters where shellfish are harvested for human consumption. Regulations allow shellfishing if samples from a water body are consistently below the following standards: 70 MPN/100ml for total coliform and 14 MPN/100ml for fecal coliform bacteria. In addition, the New York State Department of Health Services regulates swimming and other "primary contact recreation", and allows beaches to stay open where the log average of a minimum of five samples collected within a thirty day period is less than 2,400 MPN/100ml for total coliform and less than 400 MPN/100ml for fecal coliform bacteria. Shellfish closures in the Town are identified on Water Resources Maps XII-2A/-2B.

There is an extensive database documenting coliform bacteria levels in Town surface waters. In all Town harbors there are consistently high values between May and August and consistently low values between January and April. Individual analyses of coliform bacteria concentrations within each harbor are provided in the reach discussions below.

Other water quality indicators such as nitrates, heavy metals, suspended sediment, hydrocarbons, viruses and phosphates are not commonly measured in NYS DEC water testing protocols, although some correlations can be drawn between contaminants. For instance, where coliform levels are high, nitrates and viruses are often at similarly elevated levels. However, high nitrate levels may also derive from overland runoff of excess fertilizers. These other contaminants are omitted from further discussion because of a lack of data. However, they may pose significant contributions to water quality problems.

Town efforts to control coliform sources include proper siting and maintenance of septic systems (discussed in the Groundwater Regulation and Protection section below), stormwater abatement projects control of hazardous materials, a continuous water quality monitoring program, and *No-Discharge Zones* and accompanying pumpout facilities for boaters. For instance, in its *Harbor Protection Overlay District* the Town requires more restrictive standards for septic systems than the Suffolk County Department of Health Services (SCDHS). These efforts are discussed in the sections that follow.

(c) Water quality monitoring

A consistent water quality monitoring program is essential to prevent additional productive bottomlands from being lost to shellfishing, for two reasons. First, NYS DEC assumes that waters must be closed to shellfishing if they are not tested. This leaves areas of bottomlands in the Town vulnerable to closure for no other reason than lack of NYS DEC testing resources. In January 1990, shellfish closures were imposed by the NYS DEC due to lack of testing and compliance requirements of the NSSP. Second, some measure of evaluation is needed to determine if water quality protection policies and regulations are effective. If they are effective, presently closed areas can be reopened to shellfishing; if they are ineffective, other means of improving water quality should be investigated. NYS DEC should continue the current practice of sampling all of East Hampton's high priority shellfish growing areas. The Town and Town Trustees will continue to offer assistance in collecting water quality data.

(d) Boater pumpout facilities

Table 4 provides a list of existing boater pumpout facilities located within the Town as of 1997. A pilot study (Cameron Engineering, 1991) has confirmed that a modification to the Town's scavenger waste treatment plant will allow this facility to process pumpout waste even though it may contain high concentrations of formaldehyde and phenols. This modification addresses phenol processing even though they are banned in New York State, because phenols are allowed in other states and there is a high population of transient boaters in Town waters.

To assist scavenger waste plant operation, however, the use of enzymes, bacterial cultures or other biodegradeable treatments for marine sanitary devices is strongly recommended for private and public marinas during the various permit review processes and in educational material distributed to boaters by the Town. Regulation at the Federal level to require biodegradeable marine sanitary device chemistry is the most direct way to eliminate this problem.

The Town has also substantially increased its capacity to store marine sanitary waste, both at the two municipal pumpout facilities in Three Mile Harbor and Lake Montauk, and at the Town scavenger waste treatment facility. In late 1997, the Town Trustees purchased a pumpout boat and, in 1998, initiated free pumpouts in Three Mile Harbor. The boat operates primarily during the summer months when boat traffic is greatest. It has a 300 gal. tank which is emptied at the Town pumpout facility.

Table XII-4: Summary of Vessel Discharge Facilities, Town of East Hampton

Location	Hours of operation	Facility fee	Water depth	Draft limitations	Pumpout capacity and disposal/treatment
Three Mile Harbor					
Town Dock, Gann Road	24 hrs self service 8am-4pm with attendant	Free	6 ft	0%	2,725 gal capacity. 1 fixed + 1 portable pumpout unit. Waste is emptied and disposed of by contractor.
Harbor Marina	8^{30}am-4^{30}pm daily	$25	7 ft	0%	30 gal. portable unit. Trickle feeds waste from pumpout into on-site Bio-Robi septic system. Pumpouts performed as part of marina's boat care and cleaning service on hourly rate. Adjacent to free municipal facility.
Maidstone Harbor (Duck Creek)	9am-5pm wknds 5/1-10/31	$20	7 ft	0%	Fixed unit, 500 gal. sealed septic tank. Waste is emptied and disposed of by contractor.
East Hampton Point Marina	8^{30}am-4pm daily May-Oct	$5	7 ft	0%	50 gal. portable unit emptied into 1000 gal. sealed septic tank. Waste is emptied and disposed of by contractor.
Shagwong Marina	9am-5pm daily	$5	6 ft	0%	60 gal portable unit emptied into 1000 gal. sealed septic tank. Waste is emptied and disposed of by contractor.
Montauk Harbor					
Town Dock, Star Island	24 hrs self service 8am-4pm with attendant	Free	10 ft	0%	2,725 gal capacity. 2 fixed pumpout units. Waste is emptied and disposed of by contractor.

Location	**Hours of operation**	**Facility fee**	**Water depth**	**Draft limitations**	**Pumpout capacity and disposal/treatment**
Gone Fishing Marina	8am-5pm daily	$5	6 ft	5%	60 gal portable unit emptied into 1000 gal. sealed septic tank. Waste is emptied and disposed of by contractor.
Captains Cove Marina	Daily, by appointment	Variable	5 ft	10%	Contracts with a local septic waste hauler to pumpout docked boats on request into a septic pumpout truck. Fee set with boat owner by contractor.
Montauk Sportsman's Dock	9am-5pm daily	$5	6 ft	5%	60-80 gal portable unit emptied into 1000 gal. sealed septic tank. Waste is emptied and disposed of by contractor.

Source: TOEH Application for *No-Discharge Zone*, April 1997

(e) Boater and marina survey

Shellfish closure areas around marinas are determined by the NSSP established by the Food and Drug Administration. The NSSP formula is based on assumptions describing the worst case scenario for generation of contaminated waters. In an effort to test these assumptions as well as the efficacy of boater pumpout facilities, a marina and boater survey was conducted at Town marinas in the summer of 1990.

The main conclusion drawn from the survey is that actual boat occupancy at marinas is significantly lower than the NSSP assumptions suggest, with less potential for coliform pollution. Proportionately less area should therefore be closed around them. Although the number of people per boat is higher in the survey, all other occupancy factors are much lower.

The survey also indicated several ways to reach the boating population with effective education that could significantly decrease pollutant discharges. These include the following:

- Distribution of educational pamphlets at local marinas (the Town is distributing 20,000 copies of a "Boaters Guide to Water Protection in East Hampton Town").
- Public service announcements in local media.
- Prominently displayed signs at harbor entrances and marinas.
- Increase the number of Harbor Masters.
- Create a new pamphlet that specifically targets boat fueling practices.
- Increase availability of shoreside sanitary facilities and signage directing people to them.

Regarding the use and availability of pumpout stations, the survey indicated that the location of existing facilities should be more prominently advertised and that additional public facilities were needed (two municipal pumpouts have since been installed in Three Mile Harbor and Lake Montauk, see Table 4 above). As noted, additional shoreside sanitary facilities are also needed, and the existing infrastructure to treat scavenger waste requires a SPDES permit to accept boater pumpout waste.

With proper management and enforcement, marine pollution can be corrected. Environmentally safe cleaning products and head products exist. The first steps have been implemented with the distribution of public education flyers and letters to marina owners. Most survey respondents indicated a willingness to keep surface waters clean.

These recommendations and others have been incorporated into **Policies #31 and #34** covering surface water quality classifications and discharge of vessel wastes.

(f) *No-Discharge Zones*

Although boat discharges are not the principal contributor to coliform pollution, the Town and the local marine industry are working to limit all possible sources of surface water pollutants. As part of this effort the Town has received designation of its enclosed harbors as *No-Discharge Zones* from US EPA.

Existing federal law already prohibits the discharge of untreated vessel wastes within the three mile jurisdictional limit. However, federal law allows the discharge of wastes treated by federally approved marine sanitation devices. In addition to allowable levels of fecal coliform bacteria (1000 per 100 ml for Type I and 200 per 100 ml for Type II Marine Sanitary Devices), treated wastes may contain chemical additives such as formaldehyde, phenyls, and chlorine which can adversely affect water quality. Within *No-Discharge Zones*, the discharge of any vessel septic waste, *treated or untreated*, is prohibited.

Although the *No-Discharge Zone* prohibits discharge of marine septic waste from any type of marine head or marine sanitary device (MSD), it does not otherwise affect regulation of other vessel discharges such as clean bilge water, gray water, fuel spills, boat cleaners or other waste.

The federal Clean Vessel Act (CVA) of 1992 (P.L. 102-587, Subtitle F) established a five year $40 million matching (75% federal/25% participant) grant program for construction, renovation and operation of vessel waste pumpout and dump stations for holding tanks and portable toilets. A New York State Clean Vessel Act Plan (August 1996) implements the CVA, and a number of grants have been received by the Town and local marinas under this program to install pumpout facilities in Town waters.

Under Section 312(f)(3) and (4)(A) of the federal Clean Water Act the Environmental Protection Agency (US EPA) may approve the designation of vessel waste *No-Discharge Zones* where the State has identified the need for a *No-Discharge Zone*, and where there are sufficient pumpout facilities to support the designation. East Hampton Town was deemed to have a sufficient number of such facilities in the State Clean Vessel Act Plan.

Recent legislation (1995) amending the State Navigation Law (Section 33-c.10) provides that if the State petitions the US EPA for a determination regarding the adequacy of the number of vessel waste pumpout facilities in a water body to support a *No-Discharge Zone*, and the US EPA determines that the water body meets the criteria for a *No-Discharge Zone* or contains an adequate number of pumpouts, it is automatically a State designated *No-Discharge Zone*. In July 1997 the Town applied to the NYS DEC to obtain a federal *No-Discharge Zone* designation for Town harbors from US EPA. It was approved in January 1999. A local law implementing the *No-Discharge Zone*, **§149-60 to -67 et al** of Town Code, was approved by the Town Board in June 1999.

An extensive public awareness campaign including brochures, signage, public meetings and advertisements in various media has commenced to educate the boating public. In anticipation of increased usage the Town has augmented capacity of its stationary public pumpout facilities, and is trying out various public and private enterprise strategies for pumpout boats.

The *No-Discharge Zones* cover all of the Town's enclosed harbors, including the following:

Reach 1	Northwest Creek
Reach 2	Three Mile Harbor, Hog Creek
Reach 3	Accabonac Harbor
Reach 4	Napeague Harbor

Reach 5 Fort Pond Bay
Reach 6 Lake Montauk

The Town is an active participant in the Peconic Estuary Program (PEP, see below), and expects that as part of the Comprehensive Conservation and Management Plan (CCMP) for the Estuary, *No-Discharge Zones* will be established for the entire Peconic/Gardiners Bay system including the open waters of the Town, Northwest Harbor, Gardiners Bay, Napeague Bay, and Block Island Sound. As these waterbodies encompass multi-jurisdictional boundaries and include State waters, *No-Discharge Zones* would be better designated on a regional basis. Depending on the time frame of a PEP *No-Discharge Zone*, the Town may on its own initiative seek to extend the *No-Discharge Zone* to its jurisdictional boundaries.

(g) Septic systems

Leachate from sewage waste may have an adverse affect on coastal waters through subterranean flow of nutrients, pathogens and toxins into surface water and groundwater. Soils in the waterfront areas of Reaches 1, 2, 3, 4, 10 and 11 are generally highly permeable sand over a shallow and fluctuating groundwater table. Contamination in these areas results primarily from vertical migration of septic effluent to groundwater and groundwater recharge into coastal embayments. Soils in remaining Reaches 5, 6, 7, 8, 9 and 12, the Montauk peninsula and Gardiners Island, can contain large quantities of clay with resulting perched water tables. Contamination in these areas results primarily from lateral migration of septic effluent between confining layers of clay.

Alternatives to the standard septic tank/leaching pool system used throughout Suffolk County range from a zero discharge approach to better management of existing systems. Holding tanks for all wastes generated on site is the most extreme example and constitutes zero discharge. However such systems are costly due to the volume of discharges that would require pumping and hauling.

Separation of blackwater (toilet waste) from graywater (other wastewater) by using holding tanks for blackwater or composting toilets could significantly decrease pollutant loading of nitrogen and pathogens. Widespread adoption of such an approach would require planning for additional scavenger waste treatment capacity. In certain sensitive areas of the Town, such as Louse Point Road in Reach 3, an innovative septic system approach may be necessary if any meaningful improvements in water quality are to be realized.

While composting toilets and septic holding tanks are possible solutions for septic waste infiltration into surface waters from low lying parcels, 10NYCRR Appendix 75-A, "Wastewater Treatment Standards - Individual Household Systems", as cited by NYS Department of Health, does not allow the use of holding tanks, except for temporary use, and composters, where water is not available or too scarce to economically support flush toilets or where there is a need or desire to conserve water. According to the Department of Health, if a composter is used it must be in conformance with Appendix 75-A requirements, which includes National Sanitation Foundation Standard 41 or equivalent and also the installation and use of a greywater system. Since most of the State has more than adequate water resources it is unlikely that prevalent use of composters would be allowed. In the sand spit or wetland areas typical of the Town the problem is not a dearth of water, but

insufficient distance to groundwater, with the result that septic contaminants migrate more rapidly into surface waters than in normal recharge areas. These regulations may need to be reexamined to solve such septic waste problems. The New York State Building Code may also need to be revised to allow general and less restricted use of composters.

Suffolk County Department of Health regulations have recently been amended to allow for installation of innovative septic treatment systems. However, the regulations require a conventional system as backup, rendering the cost of such double-plumbed systems prohibitive. The Health Department standards for development and use of innovative sanitary waste systems should be periodically reviewed to determine whether they are needlessly restrictive, or whether any deleterious or beneficial effects have resulted from use of innovative septic systems. Whatever regulations are adopted or proposed, permitting of innovative septic systems should not be construed so as to allow new development in areas where requirements for conventional systems cannot be met.

Other recommendations to improve regulations and reduce impacts of septic waste treatment systems on water quality include:

- As recommended by several researchers (see Brown, 1980) and as adopted by other jurisdictions a minimum of 4 feet between septic system discharge points and the groundwater table should be required to protect shellfish resources and bathing beaches from coliform bacteria contamination. This standard has been adopted by the Town as as requirement for new construction within the *Harbor Protection Overlay District*. It should also be considered as a condition of granting a Natural Resource Special Permit in other sensitive areas surrounding wetlands or other waterbodies. Where this separation cannot be achieved, an innovative sanitary system should be investigated.

- Utilize innovative systems for public toilet facilities in sensitive areas where public access to the waterfront is provided. With partial funding from the Peconic Estuary Program the Town is constructing a public composting toilet facility for its municipal beach at South Lake Drive in Montauk, which may serve as a model for future installations.

- Investigate expansion of community facilities for treatment of scavenger waste, boat pumpout waste and recreational vehicle waste. The Town has installed a holding tank for boat pumpout waste , and has experimented with using the scavenger waste plant to accept boater pumpout waste.

- Investigate an impact fee + incentive system for septic system upgrades. Fees could be used to fund low interest loans to individuals who can meet a set of need-based criteria for low or fixed incomes to help them install innovative or upgraded septic systems. State legislation should be considered to permit municipalities to offer property tax incentives for septic system improvements and other water quality measures on private property.

(h) Stormwater abatement program

Precipitation that falls on land is redistributed in the following ways. About 50% of it reenters, and is dispersed, in the atmosphere by the processes of evaporation and evapo-transpiration, 40 to 50% infiltrates down into the aquifer and recharges the groundwater, and from 10% to less than 1% runs off into nearby surface waters. The runoff carries with it a variety of chemical contaminants including nitrogenous products and other nutrients, heavy metals, petroleum residues, pesticides and herbicides. These chemical contaminants degrade the receiving surface waters to varying degrees. Runoff also carries particulate matter that suspends in the receiving surface water increasing turbidity, taking up oxygen and shading out bottom vegetation. When these suspended particles settle out, they coat aquatic animal membranes and aquatic plant surfaces causing further damage. Runoff also carries with it microbes (viruses, bacteria, protozoans, fungi, etc.) that can be harmful to aquatic regimes, and can be biomagnified in filter feeders eaten by humans, especially shellfish, creating a health hazard.

Ideally, this contaminant-laden runoff should be filtered or otherwise pretreated before it enters any surface waters. The Town's *Open Marsh Water Management (OMWM)* program is designed to pretreat and filter runoff before it reaches receiving waterbodies. Such pretreatment and filtration may not be economically feasible or practical, in which case the most efficacious method of keeping runoff from directly entering surface waters is to first retain it, and then discharge it into the ground by way of leaching catchment basins (LCB's). For all new development or redevelopment situated in the immediate watersheds of Town harbors, and especially those parcels within the *Harbor Protection Overlay District (HPOD)*, and around embayments, tidal creeks and coastal ponds, LCB's or appropriate substitute devices (e.g., sumps), with sufficient capacity to handle all on-site runoff, are required under Town law.

Prior to 1980 runoff from residential subdivisions, commercial sites and roadways was, unfortunately, often handled in a different matter. Runoff was collected from roads and adjacent surfaces, parking lots and other hard surfaces and shunted by way of pipes, ditches, swales or a combination of such hydraulic devices into the nearest depression or sink. In coastal areas these sinks were usually the surface waters, the majority of which were tidal. Consequently every coastal water body in the Town is ringed with one or more up gradient pipes or ditches that carry runoff into it. Most roads peripheral to coastal waters contain one or more culverts that allow runoff to pass under on its journey downgrade.

In 1988 the Town initiated a Townwide runoff pollution abatement program in order to trap runoff from all of the roads situated in proximity to its seven major tidal embayments. Coliform levels of shellfish growing waters in those embayments were regularly exceeding safe thresholds to the degree that more and more waters were becoming closed to shellfishing because of unsanitary conditions. Since that time the Town has installed approximately 100 new LCB's in road right-of-ways surrounding six embayments, all tributaries of the Peconic Estuary. Of these six, Three Mile Harbor has received the most relief from runoff by way of LCB installation. In July 1998, 156 acres of Three Mile Harbor formerly closed were reopened by NYS DEC to shellfish harvesting. Runoff abatement for Lake Montauk has gone more slowly because of the difficulty of terrain and soil conditions, but is the next priority area. The money from two recent grants, a State Clean Air/Clean

Water grant for $100,000 to be matched by the Town, and a Federal ISTEA grant for $170,000 to be matched with $75,000 from the Town, have been specifically earmarked for alleviating runoff problems around Lake Montauk.

The Town's runoff abatement program is complicated by the fact that about a third of the road runoff running into Town coastal water bodies is generated from State and County roads. The State has recently installed LCB's at several spots along its two arteries in the Town, NYS Route 27 and NYS Route 114. Catchment installations on the latter road will handle runoff running into Little Northwest Creek and Northwest Creek in Reach 1. The few LCB's installed on NYS Route 27 in the vicinity of Georgica Pond (Reach 11) will handle only a small amount of the runoff generated along that stretch of highway. Runoff from other sections of NYS Route 27 reaches Napeague Harbor, and Fort Pond and Lake Montauk in Montauk. The ISTEA funded project at the south end of Lake Montauk will handle most of NYS Route 27's contribution of runoff to that body of water. Presently there is no provision to provide relief from State-highway generated runoff to Napeague Harbor and Fort Pond, although a Town plan for alleviating the State highway runoff to Fort Pond has recently been drafted and awaits funding and implementation.

Suffolk County has three major arteries peripheral to Town coastal waters: Three Mile Harbor Road along the south and east sides of Three Mile Harbor, Edgemere and Flamingo Avenues along the east side of Fort Pond and Flamingo Avenue, and West Lake Drive along the west side of Lake Montauk. The Town has installed a sufficient number of LCB's to handle runoff generated by Three Mile Harbor Road, and almost enough LCB's to handle runoff generated on the eastern part of Flamingo Avenue draining into Lake Montauk. West Lake Drive's chronic runoff problems are to be addressed with State Clean Air/Clean Water Act grants awarded to the Town and County, and funds to be matched by them, as part of the Lake Montauk Runoff Pollution Abatement Plan.

There are no funds presently earmarked to alleviate runoff from Edgemere and Flamingo Avenues into Fort Pond. A Town Fort Pond Pollution Abatement Plan addresses the Edgemere-Flamingo runoff problem, but awaits funding. In 1997 the Town completed an inventory of road-ends (see **Projects**), resulting in a series of recommendations and prototype designs for mitigating stormwater runoff at a number of locations.

(i) Harbor Protection Overlay District

The Town established a *Harbor Protection Overlay District (HPOD)* in 1995 to protect the surface waters of the Towns inner harbors by regulating the most immediate contributing areas surrounding them. The eventual goal of the HPOD is no additional losses of bottomlands to shellfish closures and reopening of as many areas as possible that are closed to shellfishing at present. The *HPOD* covers an area approximately one lot deep around the harbors (see Water Resources Maps XII-2A/-2B). Requirements include measures to control runoff, improve septic systems, provide vegetative buffers, and to reduce use of fertilizers and pesticides in affected areas. *HPOD* also incorporates a public education component which is important to fulfilling the voluntary goals for individual homeowners and property owners. See **Appendix C** for the full text of the *HPOD* local law.

Harbors included in the *HPOD* are:

Reach 1	Northwest Harbor, Northwest Creek
Reach 2	Three Mile Harbor, Hog Creek
Reach 3	Accabonac Harbor
Reach 4	Napeague Harbor
Reach 5	Fort Pond
Reach 6	Lake Montauk
Reach 11	Georgica Pond, Wainscott Pond

If *HPOD* measures prove effective in improving water quality, the Town should consider expanding the district areas to cover the primary and contributing watersheds of all Town waterbodies, including the open harbors and bays.

Among the measures included in the *HPOD*, or otherwise recommended to prevent additional losses of bottomlands to shellfishing, and to reopen as many areas as possible that are presently closed to shellfishing, are the following:

(a) Distribute educational materials to all property owners regarding proper maintenance of septic systems including use of biodegradable cleaners, water conservation fixtures, removal of garbage disposals, regular inspections and service and opportunities for septic system upgrades.

(b) Limit the use of inorganic fertilizers, biocides and other persistent toxic chemicals such as oils for driveway maintenance.

(c) Designate native or other appropriate species for bank and bluff stabilization that do not require pesticides, excessive irrigation or fertilization.

(d) Require a minimum buffer area of 50 feet of native vegetation to remain in place or be re-established upland of wetlands or surface waters when a site is reviewed for development.

(e) Require drywells for all swimming pool discharges and locate drywells and pool chemical storage structures no closer than 100 feet upland of wetlands and surface waters. Prohibit the discharge of pool cleaning acid wash which has not been neutralized.

(f) For building materials in contact with surface waters, only permit chemically treated wood when structurally sound alternatives do not exist (see appendix 9).

(g) Check existing underground residential fuel tanks for leaks, and replace defective tanks.

(h) Utilize clearing and turf restrictions similar to the Water Recharge Overlay District.

(i) Investigate an impact fee/incentive program to upgrade septic systems to current standards, and encourage use of innovative or alternative sanitary systems. Such a program could be established in the following fashion:

(1) Inspection of current system (using a dye test or other method) by Sanitation Inspector to establish need for upgrade to current standards.

(2) If at current standards, no impact fee is assessed.

(3) If below current standards, a two year deadline after inspection is provided to upgrade and if upgraded, property tax credit or reduction would be given to property owner. If system is not upgraded, an annual impact fee is assessed.

(j) When a variance to wetland setback requirements is considered on pre-existing single and separate lots, the septic system would be inspected and if it is below current standards, brought up to current standards or replaced with an innovative or alternative system.

(j) Hazardous material spills

In addition to pathogens, metals and hydrocarbons in the stormwater runoff waste stream, other hazardous materials pose direct risks to ground and surface waters and wetlands. These include fuels (storage, spills and fuel dispensing on land and over water on the docks), waste oil, pesticides and herbicides, and chemicals and solvents, both households and commercial, used for painting, refinishing, cleaning and degreasing all manner of natural and synthetic materials.

Regulatory controls on the release of these materials into surface waters and groundwater come from several sources. Regulations of the Suffolk County Sanitary Code, Article 12, which went into effect in 1980, established standards for noncorroding, secondary containment for all hazardous material storage facilities. All single walled underground fuel and other hazardous materials storage tanks were required to be upgraded or removed by January of 1991. With stiff daily fines and no extensions being offered to operators not in compliance, all single walled tanks were systematically replaced by double walled fiberglass below ground tanks or by single walled above ground tanks. Existing heating oil tanks did not required replacement, but those over 1,100 gallons require testing every five years. According to the Hazardous Waste Management Division of the Suffolk County Department of Health Services (SCDHS), plain steel heating tanks do not corrode or leak, pose no threat to groundwater, and are therefore not regulated by Article 12. In East Hampton this has been found not to be the case, and heating tanks have been known to corrode and leak, and have consequently been regulated in the HPOD. Further testing and study is recommended.

Data compiled by the Town of reported hazardous material spills between 1987 and 1990 indicate that the majority of reported spills are petroleum related and have occurred predominantly in the

Montauk portion of the coastal area. This pattern of spill incidents may reflect the exclusion of other central business areas from the coastal area in the western portion of the Town, as well as the concentration of commercial activity and marinas around the water in Montauk.

As noted in **Flooding and Erosion Policies #11-17**, certain flood hazard areas in Montauk such as Industrial Road between Fort Pond and Fort Pond Bay, and the area surrounding the docks in Coonsfoot Cove, should be inventoried for hazardous materials and remedial measures taken to insure they do not pose unacceptable risks for release of such materials in the event of storm flooding. Other locations may also require specific remediation. At the former military installations at Camp Hero, where a leaking fuel tank caused a devastating spill into Oyster Pond in January, 1991, potential hazards should be surveyed and remediated by New York State as part of a management and reuse plan (see also **Significant Habitats Policy #7, and Public Access and Recreation Policies #9 & #19-22**). Given this and other data the Town decided to regulate fuel tanks in the HPOD.

(k) Peconic Estuary Program (PEP)

In 1995 the Peconic/Gardiners Bay Estuary was approved for nomination into the National Estuary Program (NEP) by the US EPA. The Peconic Estuary Program was initiated by a coalition of federal, state, county and local government agencies and citizens in April 1996, and with federal financial assistance, has assembled an array of scientific information designed to culminate in a Comprehensive Conservation and Management Plan for issue in mid-1998. PEP has emphasized water quality and related land use and natural resources issues, especially related to the Brown Tide, and expects to recommend a series of actions to the county and five local town governments encompassing the Peconic/Gardiners Bay system.

East Hampton Town has been an active participant in the PEP. The Town Supervisor chairs the PEP Local Government Committee, the Town Planning Director chairs the PEP Technical Advisory Committee, and a number of citizens are active on the PEP Citizens Advisory Committee. The Town expects a spectrum of regional water quality measures to be implemented as a result of PEP, including upgrades of the Riverhead and Sag Harbor Sewage Treatment Plants, non-point source remediation, regional vessel waste *No-Discharge Zones*, stormwater runoff remediation, upland land use reforms, and extensive public education to encourage best management practices (BMP's) by homeowners and recreational and commercial users of the estuary.

(l) Other Town water quality initiatives

In addition, the Town and Town Trustees have undertaken a number of projects to improve and monitor ground and surface water quality, and others are proposed in **Section XIV, Projects**. Some of these initiatives are:

Open Space Plan

Completed September 1995, this report provides recommendations for remaining undeveloped parcels, many bordering enclosed harbors. Open space accomplishes a multitude of planning objectives including water recharge and filtration, habitat preservation and recreation. The plan proposes a variety of public and private planning alternatives

including acquisition, open space cluster development, easements, management agreements, etc.

Open Space Acquisitions

The Town has acquired large amounts of open space, much of it in watershed areas of its harbors and bays, by direct purchase funded by local bond issues, or purchased in cooperation with other levels of government. Examples of larger tracts include the Grace Estate and Barcelona Neck in Northwest, Hither Woods in Montauk, and many smaller parcels including sensitive pieces surrounding Northwest Creek, Three Mile Harbor, and Accabonac Harbor. The Town also works closely with non-governmental organizations such as The Nature Conservancy and Peconic Land Trust, and has an active Open Space Committee engaged in identifying and prioritizing open space purchases and funding.

Open Marsh Water Management (OMWM)

The Town Natural Resources Department (NRD) has constructed small dams to block mosquito ditches through saltmarsh areas surrounding the harbors, in order to impound pollutants and allow them to be naturally filtered through the saltmarsh. Reintroduction of natural predators also is an effective and more desirable method for mosquito control, and helps to restore the nursery productivity of the harbors.

Stormwater Abatement

Stormwater abatement work (see above) has been performed for many locations around Accabonac and Three Mile Harbors. The Town has received funding for stormwater remediation around Lake Montauk under the State Clean Water/Clean Air Bond Act. Catchment and marsh filtration areas, including for the poorly flushed marina area of Coonsfoot Cove, are being designed by the Town in a cooperative effort by the Natural Resources and Highway Departments and the Town Engineer.

Marsh Pond Filter System for South Lake Montauk (Oceanside Drain Project)

This project is designed to impound and filter pollutants emanating from the low lying Oceanside subdivision at Ditch Plains, which has been a documented source of coliform in South Lake Montauk. Design, engineering and permitting for the project is largely complete and work is projected to be completed in 1998.

Composting Toilet, South Lake Drive, Montauk

Utilizing partial funding from the Peconic Estuary Program, the Town is designing and constructing a composting toilet at a public bathing beach to demonstrate use of waterless toilets in preventing pollutants from entering the harbors.

Road-ends Survey and Redesign Project

Under an Environmental Protection Fund matching grant obtained through the NYS Department of State, the Town Natural Resources Department surveyed road-ends leading to surface waters, and designed prototype solutions to control stormwater runoff, flooding and erosion.

Water Quality Testing Program

In response to shellfish closures based on inadequate water quality testing, the Town has conducted its own water testing program in conjunction with Cornell Cooperative Extension and NYS DEC Stony Brook. The objective is to quantify water quality in order to maintain open shellfish areas, to identify sources of pollutants and problem areas in the harbors.

Boater Education

The Montauk Harbor Association, in cooperation with the Concerned Citizens of Montauk, has published brochures promoting environmentally sound boating practices, e.g. using pump-outs, bio-degradable detergents, etc. In 1997, in anticipation of establishing a *No-Discharge Zone*, the Town published 20,000 copies of a Boater's Guide to Water Protection. Town Harbormasters also conduct regular presentations to students and other groups on safe boating and other boating procedures. A *Clean Waters, Better Boating* promotional campaign has been inaugurated in 1998 to publicize the *No-Discharge Zone* and other Town clean water initiatives. The Town intends to amplify and continue these efforts in coordination with the local marine industry and the Peconic Estuary Program.

C. Surface Waters and Wetlands, Reach Inventory and Analysis

Reach 1 - Northwest

In 1983, the Generic Environmental Impact Statement Concerning Future Development at Northwest Harbor noted that "the Northwest Harbor has one of the most extensive and pristine salt and freshwater wetland systems in Suffolk County." This remains true today and was further assured due to the Town acquisition of the Grace Estate property in 1986, NYS DEC purchase of Barcelona Neck in 1989, and The Nature Conservancy's Mashomack Preserve on Shelter Island.

A detailed descriptive inventory of the surface waters and wetlands in this reach is provided in the above mentioned study. The shoreline is relatively undisturbed with minimal development. There are, as a result, hundreds of acres of undisturbed tidal and freshwater wetlands. The upland surface and subsurface freshwater are divided into three watershed systems which flow into two separate receiving basins.

The watersheds are summarized as follows:

UPLAND WATERSHED	RECEIVING BASIN	REPRESENTATIVE WETLAND TYPES
Little Northwest Creek	Sag Harbor Bay	intertidal marsh high marsh coastal freshwater marsh
Northwest Creek	Northwest Harbor	intertidal marsh high marsh coastal freshwater marsh brackish meadow
Alewife Pond-Scoy Pond	Northwest Harbor	all marine and freshwater types except seep communities

Water quality classifications in Reach 1 are generally of a high standard. The waters of Sag Harbor Bay, Northwest Harbor and Northwest Creek are all classified as SA waters (see overview), the highest for any marine waters. However, measurements of coliform bacteria have exceeded NSSP standards for shellfishing in portions of Northwest Creek and Alewife Brook. Following NSSP regulations, Northwest Creek is designated as Uncertified for shellfishing by NYS DEC. The northern portion is open conditionally to shellfishing and the boat basin and the southern portion are closed year round (see Water Resources Maps XII-2A/-2B. The opening of the northern portion is conditioned on not more than .25 inches of rainfall recorded in a 24 hour period, after which the area is closed for a week. The Alewife Brook/Alewife Pond system is also closed year round to shellfishing. For these reasons, the highest drainage abatement priorities recommended for Reach 1 are to address significant stormwater runoff inputs to Northwest Creek and Alewife Brook.

Little Northwest Creek and the Alewife Brook/Alewife Pond system are classified SC. Except for an unnamed pond south of Scoy Pond, classified as D, the other freshwater bodies in this Reach, Rattlesnake Creek, Little Northwest Creek, Scoy Pond and tributaries to Alewife Pond are classified as B.

Several of the areas of poor water quality in Reach 1 are adjacent to Suffolk County parklands. Possible sources of contamination in these areas include drainage ditches, culverts, illegal dumping, parkland activities and toilet facilities, wildlife and a small cemetery on Swamp Road. With very limited flushing in the Alewife Brook and Northwest Creek systems, even small sources of contamination may have dramatic impacts on water quality.

To test the contribution of coliform bacteria from the vector control ditches leading to the harbor, Cornell Cooperative Extension has been gathering data on total and fecal coliform levels in the ditches of Northwest Creek (Reach 1) and Accabonac Harbor (Reach 3). This data has been used to pinpoint areas that require drainage abatement structures, septic system upgrades or some type of *Open Marsh Water Management (OMWM)*. Approximately eighteen ditches leading to Northwest

Creek have been dammed by the Town Natural Resources Department. Whereas vector control ditches shunt water quickly from wetlands to the harbor, these dams have allowed the wetlands to collect and filter the water with high coliform bacteria levels before reaching the harbor. The dams have allowed the water to remain in the wetlands which has effectively reduced the coliform bacteria levels in the harbor. In other instances, ditches may be connected to increased flushing of high coliform areas (Hasbrouck, 1991).

The secondary sewage treatment plant (STP) in Sag Harbor has an effluent outfall pipe leading into Sag Harbor Bay. This plant, having a 150,000 gallon daily capacity, is the only sewage treatment plant that discharges into surface waters within the boundaries of East Hampton. During summer months when sewage generation is high the system exceeds treatment capacity in heavy rain events. At these times, an additional 50,000 gallons of untreated liquid waste can be retained in an equalization tank as part of an emergency backup system. Upgrades are needed for this plant to reduce the nitrogen loading in the effluent and to accommodate the waste flow. On the ebb tide effluent from the Sag Harbor STP is released into Northwest Harbor.

Prior to the Brown Tide algae bloom of 1985, 1986 and 1987, which decimated scallop stocks, the Peconic/Gardiners Bay typically accounted for about one-quarter of all bay scallops harvested in the United States (Suffolk County Planning Department [SCPD], 1987). As part of the Peconic/Gardiners Bay system, Northwest Harbor was one of the best scallop producing areas on the east end. The relatively undisturbed uplands in Reach 1 contribute to otherwise high water quality in the harbor. On this basis bay scallop reseeding activities of the Green Seal Management Committee have focused on sites in Northwest Harbor and Northwest Creek respectively (U.S. Army Corps., 1989). Many of the planted scallops successfully overwintered in 1988/89 and produced offspring in the 1989 and 1990 summer seasons. Unfortunately, cell counts of *Aureococcus anophagefferens*, the Brown Tide algae, reached 500,000 cells per milliliter from mid June through early July of 1991 and the scallops were threatened once again. In an effort to protect the scallops from the 1991 Brown Tide, 30 bushels were transplanted from Northwest Harbor to Lake Montauk on July 4th, 1991. Scallops were also relayed by NYS DEC to Moriches Bay (18 bushels) and Shinnecock Bay (20 bushels). The data provided by the SCDHS regarding the high level of *Aureococus anophagefferens* helped to develop a timely response for relaying the scallops.

Although bay scallops are the most important fishery, Northwest Harbor also supports oysters, hard clams, conch, eels, mussels and a variety of finfish. Human and natural impacts also affect these fisheries.

Reach 2 - Three Mile Harbor/Hog Creek

This reach encompasses the westernmost basin of Gardiners Bay within Town jurisdiction as well as the Three Mile Harbor and Hog Creek watersheds. Three Mile Harbor is a 1,125 acre embayment fringed by 83 acres of tidal wetlands (SCPD, 1983). Hog Creek is a considerably smaller waterbody, 37.2 acres, with a thin wetland fringe along its border that is situated on residential properties and has been partially bulkheaded (see **Flooding and Erosion Policies #11-17**). Both water bodies are tidally connected to Gardiners Bay.

The largest freshwater wetland in this reach, an emergent marsh, is located south of Soak Hides Dreen. The majority of the wetlands in this reach are tidal. The natural resources inventories prepared for the Three Mile Harbor Watershed (SCPD, 1983) and the Accabonac Watershed (SCPD, 1987) describe the extent and distribution of the wetlands in Three Mile Harbor and Hog Creek respectively. Although not noted in the 1983 study, *Seep communities* (see Table 1) are found along the steep banks of the Springy Banks and Hands Creek areas.

Water quality in the reach has historically been very good. Gardiners Bay, Hog Creek and Three Mile Harbor are classified as SA. Hands Creek, a tidal creek contiguous with Three Mile Harbor, is designated as SC, and Soak Hides Dreen, a freshwater tributary that drains into the southern portion of Three Mile Harbor, is designated as B. Good water quality contributes to prime habitat for wintering waterfowl, nesting shorebirds and the threatened osprey. See **Significant Habitats Policy #7**. However, pollution evidenced by coliform bacteria levels and the recurrent Brown Tide have placed the ecosystem in jeopardy, and although Brown Tide has receded, eelgrass beds and bay scallop populations have yet to rebound in Three Mile Harbor.

Water Resources Maps XII-2A/-2B denotes the areas in Reach 2 now closed to shellfishing under NSSP guidelines. **Policy #34** provides recommendations on how this closure may be diminished or avoided.

Coliform data for Three Mile Harbor show that coliform bacteria reach their maximum levels in the summer season in the areas where there is both poor flushing and a concentration of marinas and stormwater runoff. These areas include the head of the harbor north of Soak Hides (Tan Bark) Creek and the southeastern side of the harbor. Many sources contribute to coliform contamination including stormwater runoff, marine head waste, poor flushing of tidal creeks, and malfunctioning septic systems situated in filled wetland areas that rest in the groundwater.

The Town is pursuing all available means of remediating pollution. Table 4 lists pumpout stations located throughout Three Mile Harbor. Acquisition of sensitive lands at the head of the harbor has contributed to the reduction of septic leachate by removing marginal land from development. Stormwater abatement efforts to date in Reach 2 have included installation of catchment basins to collect and filter stormwater runoff. Three Mile Harbor is surrounded by extensive residential development with many sources of stormwater runoff. Many of these inputs have either had remedial drainage work completed or are targeted for future drainage abatement projects.

The portion of Hog Creek is surrounding the Clearwater Beach marina is closed seasonally to shellfishing from April 1 to December 14 (NYS DEC, 1998). See Water Resources Maps XII-2A/-2B. The remainder of the Creek is open. As in the Three Mile Harbor watershed, Hog Creek is surrounded by dense residential development and high volume stormwater runoff, a high priority for drainage abatement requirements, and considerable abatement work has been completed to date.

Reach 3 - Accabonac

Reach 3 extends from Hog Creek Point to Devon and includes the eastern basin of Gardiners Bay to where it connects with Napeague Bay to Block Island Sound. It includes Accabonac Harbor and

Fresh Pond. Two upland watersheds drain into Accabonac Harbor, with the Fresh Pond drainage system to the south. The 14.7 acres of Fresh Pond were given the highest rank among several environmental criteria that assessed water quality in the 1984 Town Comprehensive Plan (TOEH, 1984) and is designated as a Locally Significant Coastal Fish and Wildlife Habitat (**Significant Habitats Policy #7**). NYS DEC has classified Gardiners Bay and all of Accabonac Harbor under a water quality standard of SA.

The 306.0 acres of Accabonac Harbor is surrounded by approximately 275 acres of relatively undisturbed wetland habitat (SCPD, 1987). Over 634 acres surrounding Accabonac Harbor has been permanently protected by acquisition by New York State, Suffolk County, the Town, and The Nature Conservancy.

The areas directly influenced by the daily tides contain intertidal, high marsh and formerly connected wetlands. Four categories of freshwater marsh occur as well, including coastal freshwater, emergent and flooded deciduous wetlands, and cranberry bog wetlands. All wetlands types are described in the overview above. The extent of the tidal and freshwater wetlands is mapped in the 1987 Accabonac Harbor Area Study (SCPD, 1987).

The water quality in the harbors and ponds of this reach is generally very good. However, coliform bacteria data from Accabonac Harbor show several areas of fair to poor water quality including the area receiving discharge from Pussy's Pond, East Harbor and the area receiving stormwater runoff from Landing Lane. Fecal coliform values consistently exceed standards in these areas. In accordance with NSSP standards, NYS DEC has closed the entire southern end of the harbor seasonally (May 1 to November 30) to shellfishing. From December 17 to April 30, East Harbor is open conditionally, depending on rainfall. If more than .30 inches of rain falls within a 24 hour period the conditional area is closed for a seven day period following (NYS DEC, 12/97). See Water Resources Maps XII-2A/-2B.

High coliform counts in the above areas result from a number of factors. Due to restricted outflow, contaminants are circulated on the daily tides within, rather than flushed out of, the harbor, (SCPD, 1987). Complete flushing has been estimated to take from five days (Pritchard and Gomez-Reyes, 1986) to ten days (SCPD, 1987), up to 14 days (Welker, 1976/77). In addition, contaminants reach the harbor through stream flow, stormwater runoff, boat waste, vector control ditches and groundwater seepage that entrains septic effluent.

Drainage improvements have been installed to collect and filter stormwater before it reaches Accabonac Harbor at Landing Lane, Louse Point Road, Shipyard Lane, School/Cross Street and Springs Fireplace Road. Priority projects, both completed and pending, are concentrated at the southern end of the harbor where shellfish closures are already in effect. As noted in the Reach 1 discussion above, the vector control ditches of Accabonac Harbor are being tested by Cornell Cooperative Extension for sources of coliform bacteria contamination (see Reach 1 discussion). A pilot *Open Marsh Water Management (OMWM)* project to dam up the vector control ditches and impound contaminants, has met with some success (see **Projects**).

The land immediately surrounding Fresh Pond is entirely owned by the Town and is designated parkland. However, high coliform counts in Fresh Pond, as taken by NYS DEC in January, 1986, resulted in a year round closure of the pond to shellfishing. Contamination can be attributed to several factors including limited interchange between the bay and the pond, a public restroom leaching field in proximity to the pond, and pollutants from the up-gradient residential area, which are directed into the pond by Vector Control ditches traversing a large wetland system. With such a long term water quality problem in an area surrounded by parkland, the Fresh Pond watershed is a high priority for drainage abatement.

Reach 4 - Napeague North

Reach 4 is defined by the north shore of a sandy isthmus that connects the Montauk headland with the rest of the south fork at Amagansett. This area, along with Reach 10, is known as Napeague, a Montauk Indian word meaning "waterland". The surface waters in the reach include Napeague Bay and Block Island Sound; Napeague Harbor, a large shallow embayment; Napeague Pond (Pond of Pines), a brackish pond tidally associated with Napeague Harbor; and Fresh Pond, a true groundwater table pond situated to the east of Napeague Harbor.

Water quality in this Reach is very good and supports several diverse plant and animal communities of commercial, ecological and recreational importance. The NYS DEC designates all waterbodies in the reach with "SA" classifications, except for Fresh Pond, a fresh/brackish coastal pond designated "C".

Coliform bacteria sampling in Napeague Harbor indicates the best water quality in any of the Town's harbors. Napeague Harbor supports the largest self-sustaining bay scallop population in the Town. However, the coliform data suggest that several areas should be monitored closely to protect against future contamination. These include the southeast corner of the harbor adjacent to several septic systems, road end stormwater runoff areas, the area adjacent to Crassen Boulevard and the mooring area.

The wetlands in this reach are also extensive and diverse. There are many freshwater cranberry bogs and a large salt marsh known as Napeague Meadows. This marsh is located between the bay and ocean dune lines and open to the tides from the southwest corner of Napeague Harbor. Two sources, Johnson (1985) and TOEH (1989), provide a map of the extent and distribution of these wetlands and surface waters.

The tidal wetlands of the Napeague Meadows were ditched and drained in the 1930's and sprayed with DDT for mosquito control. The ecological response for two decades (end of World War II to mid-1960) was the near disappearance of the osprey in the 1960's. While the ditches are still maintained by Suffolk County Vector Control, DDT was banned in the early 1970's, and by 1983 the ospreys started nesting again at Napeague.

Reach 5 - Hither Woods/Fort Pond Bay

The wetlands and surface waters in this reach are primarily associated with the northern shoreline of the Montauk headland starting at the east end of the Napeague isthmus, and extending to Culloden

Point at the north end of Fort Pond Bay. In addition, several freshwater ponds collect surface runoff and groundwater seepage from the surrounding upland and drain into Fort Pond Bay.

The NYS DEC has classified the marine surface waters in this Reach as "SA". However the freshwater ponds, Fort Pond and Tuthill Pond are classified as "B" and "C" respectively. Tuthill Pond is frequently subject to overwash by saltwater in storm conditions.

Fort Pond Bay is an exceptionally pristine body of water that is very deep near shore (47') and well flushed by open tidal connection to Block Island Sound. For these reasons, the Town chose Fort Pond Bay for the site of a municipal aquaculture facility for hatching and growing out shellfish. The shellfish are used to stock Town and nearby State waters.

The majority of the Fort Pond Bay shoreline is steeply sloped, resulting in few areas of tidal marsh. There are freshwater wetlands associated with Tuthill Pond and Fort Pond located primarily down-gradient, i.e. between the ponds and Fort Pond Bay. Other freshwater wetlands are found in this reach in kettlehole depressions near Culloden Point.

Opportunities exist along the southernmost curve of Fort Pond Bay for reclamation and creation of wetland habitat previously lost by regrading and fill deposition during construction of roads, the railroad, and other structures.

The greatest threat to surface water ecosystems in Reach 5 is degradation due to increased pressures for commercial and marina development. Existing zoning in this area allows for Residential, Commercial Industrial, Neighborhood Business, Central Business, Waterfront and Resort uses.

Reach 6 - Lake Montauk

Reach 6 includes the 1102.0 acres of Lake Montauk, and its watershed, which includes Big Reed and Little Reed Ponds, Stepping Stone Pond, and numerous freshwater and tidal wetlands. It extends into Block Island Sound to include Washington Shoal and Shagwong Reef. The north end of Lake Montauk, Montauk Harbor, is best known as the heart of the commercial and recreational fishing industry in East Hampton.

NYS DEC has classified all the marine surface waters in this reach as SA. However as shown on Water Resources Maps XII-2A/-2B, several areas of Lake Montauk are closed to shellfishing. Coonsfoot Cove is closed year round and areas east of Star Island and at the southern end of the Lake are closed seasonally (NYS DEC, 12/97).

Tidal flushing in Lake Montauk occurs through the 500-foot wide inlet at the lake's northern end. While the northern two-thirds of the lake are generally well mixed, Star Island is situated directly south of the inlet and directs currents to the east, limiting flushing of the south end of the Lake. Coonsfoot Cove, to the west of Star Island, is rendered virtually stagnant due to the Star Island causeway that connects the former island to the western mainland. In addition to this poor circulation, pollution sources in Coonsfoot Cove include boat cleaners and waste, stormwater runoff,

septic waste from malfunctioning systems, dredging that can resuspend contaminants in the water column, fuel spills, leaking fuel tanks and bilge evacuation.

Several studies of water circulation patterns within Coonsfoot Cove have shown that without providing a significant new opening into the Cove (such as replacing the filled causeway with a bridge) only minor improvements, if any, would result to water quality. Should a project be undertaken to improve water circulation and water quality of Coonsfoot cove be considered in the future, a full impact analysis of the changes in water quality in the southern portion of the lake should be conducted.

The coliform bacteria data show that areas within Lake Montauk have the highest levels of fecal and total coliform bacteria Townwide. Bacterial contamination at the southern end of the lake is highest, exceeding standards year round. Contributing sources are stormwater runoff and high density upland use, coupled with sluggish tidal circulation which limits flushing. Faulty septic systems, boat wastes and wildlife all contribute to deteriorating water quality.

A proposal for natural treatment for stormwater runoff from the Oceanside-Ditch Plains Drainage System subdivisions into the south end of the Lake will redirect runoff to a pre-treatment marsh system before it enters Lake Montauk. However, this system has been in the design phase for some years and awaits construction. Meanwhile, this runoff continues to flow directly into southern Lake Montauk. Correction of this problem is assigned the highest priority for drainage abatement because of the severity of the coliform bacteria contamination in this area. Adjacent areas, contributing to stormwater runoff at the southern end of the Lake are also given high priorities for drainage abatement efforts.

High levels of coliform bacteria also exist in Coonsfoot Cove, the east side of Star Island and the northeastern shore of the Lake resulting from dense commercial development, particularly marinas, and high volume overland runoff. Some levels exceed standards well into November at sampling stations closest to Star Island. A proposed *No-Discharge Zone* for the Town's harbors, in conjunction with planned upland drainage remediation, is expected to substantially alleviate these problems.

Tidal wetlands, as defined in the overview, border the perimeter of Lake Montauk, the majority of which are of relatively recent origin. As noted below in the section on dredging, the northern inlet of the Lake was permanently opened to Block Island Sound in the 1920's. Consequently, there is relatively little peat buildup in the tidal wetlands. The most extensive tidal wetlands are located in the outwash delta of the Oceanside drainage system. In addition, the east shore of the Lake is subjected to wave action associated with the prevailing summer winds. The tidal wetlands on the west side of the Lake are, therefore, likely to increase more rapidly than on the east (Inter-Science Research Associates, 1983).

Freshwater wetlands are abundant in this area, as may be seen on Map XII-1, and on the Natural Resources Map in the County study (SCPD, 1981). These wetlands occupy streams, drainage

ditches, and kettle depressions and are connected overland or through underground seepage (Inter-Science Research Associates, 1983).

Peter's Run, a *True Groundwater Stream* entering the west side of Lake Montauk, has historically been one of the tributary sources of contaminants into the Lake. Tests by the Suffolk County Health Services Department and the Town Natural Resources Department indicate high coliform levels and high concentrations of nitrates coming into Lake Montauk from Peter's Run. In 1996 the Natural Resources Department and the Concerned Citizens of Montauk sampled Peter's Run monthly and found similarly high coliform and nitrate levels. However, tests for pesticides presumed to come from the Montauk Downs Golf Course were inconclusive.

On the east side of Lake Montauk, Big Reed Pond and its associated freshwater wetlands provide important habitat for waterfowl and other wetland species. This pond feeds Little Reed Pond through a *True Groundwater Stream*, but Little Reed Pond is itself an *Estuarine* waterbody tidally linked to Lake Montauk.

Reach 7 - Oyster Pond/North Montauk Point

The surface waters in Reach 7 include Oyster Pond, a large *Coastal Pond*, and the easternmost extent of Block Island Sound before it merges with the Atlantic Ocean at Montauk Point. Oyster Pond drains the upland *Downs* in this Reach and is intermittently opened to the Sound across a bay mouth sand bar.

The sandbar that separates Oyster Pond from the Sound influences the ecology and water quality of this coastal pond. The wetlands fringing the *Estuarine* pond are brackish and fresh rather than intertidal or *High Marsh Wetland* (see the overview descriptions). As a result, there is an abundance of rare and endangered species (see TOEH, 1991 and **Significant Habitats Policy #7**). With only sporadic tidal flushing, the pond is predominantly fresh. Not only do coliform bacteria survive longer in fresh water than in saline, but coliform input to the pond derives from several sources. There is considerable upland use by horses, recreational vehicles, and campers throughout the summer, abundant waterfowl in the pond itself throughout the year, and episodic septic waste overflow from the Camp Hero treatment plant.

In 1984 and 1985, the community septic system serving the 27 homes in the Camp Hero affordable housing neighborhood failed. The pumps designed to transport the liquid waste to the leaching fields broke down and sewage overflowed into a stream leading to Oyster Pond. Following the second incident, an overflow tank was installed to contain septic wastes in the event of a malfunction of the system. The East Hampton Department of Sanitation now maintains the sewage system serving Camp Hero and there have been no further failures.

Another episodic event occurred in February of 1991 when approximately 2500 gallons of heating (No. 2) oil from a disused fuel tank in the southwest quadrant of the former Camp Hero military base leaked into the watershed and headwaters of Oyster Pond. Some oil was cleaned up by the East Hampton and eventually State Haz-Mat teams, but a large amount of oil contaminated the

headwaters and entered Oyster Pond. More than 50 reptiles and amphibians were killed and large amounts of oil were trapped in the bottom sediments of these streams (Penny, 1993).

Oyster Pond is designated under a water quality classification of SA but was permanently closed to shellfishing in 1985 due to high coliform levels. Notwithstanding this closure, the Town of East Hampton still uses the pond as a seed farm for oysters. Every second year the Town Shellfish Hatchery, Natural Resources Department, Bay Constables and Town Baymen harvest between 250-500 bushels of oysters from the pond and "relay" them to the various harbors throughout the Town. Once relocated in cleaner waters, a depuration period is required for the oysters to flush bacteria from their systems before any harvest is allowed.

Reach 8 - Montauk Bluffs

Reach 8 extends from Montauk Point to the westerly limit of Montauk Shores trailer condominium at Ditch Plains. The upland area is almost entirely *Moorlands* underlain by thick clay lenses of up to 75 feet. The unusual surface geomorphology produces a complex drainage network and a land surface that is almost 60-65% *Perched Water Table* wetlands including ponds, bogs and streams. These wetlands systems are diverse and fragile. They support an abundant variety of plant and animal species including many rare and endangered plants and animals (TOEH, 1981, 1991; see **Significant Habitats Policy #7**).

The shoreline is exposed to the open Atlantic Ocean with resultant erosive forces. Additional erosion occurs as a result of freshwater seepage from the face of the bluffs (see **Flooding and Erosion Policies #11-17**). Wetland *Seep Communities* exist at the freshwater sources but heavy rains can also cause loss of clays, silts and sometimes large boulders. Old *Perched Water Table* wetlands near the edge are drained as the bluff face erodes landward. Offshore fishery resources are abundant and ocean water quality is excellent; it is classified "SA" by the NYS DEC.

Reach 9 - Hamlet of Montauk

Starting at the western end of the eroding bluffs, Reach 9 extends along the southern ocean beach shoreline to the eastern boundary of Hither Hills State Park, and includes the downtown Montauk business district.

Perched Water Table wetlands are associated with the *Moorland* topography at the eastern end of Reach 9 (TOEH, 1988). Drainage from these and many other wetland systems in the reach has been altered with development of the Ditch Plains/Oceanside subdivisions, the Montauk Central Business Area, resort and residential development south of Old Montauk Highway, and along the shorefront. So much of the natural drainage pattern has been changed that the Generic Environmental Impact Statement concerning Surfside Estates (TOEH, 1988) recommended all remaining wetlands be preserved in their natural state.

There are fewer wetlands between the western edge of the Hamlet of Montauk and the western boundary of Reach 9 due to lesser amounts of clay in the subsurface.

As in Reach 8, offshore fishery resources are well utilized and the ocean waters are classified SA, the highest water quality for marine waters.

Reach 10 - Napeague South

Reach 10 extends from the east boundary of Hither Hills State Park along the ocean shore of the Napeague isthmus, westward through Amagansett to the east boundary of East Hampton Village. It includes the Atlantic Double Dunes system, an unusual complex of primary and secondary dunes, swales, wetlands and bogs.

The wetlands found along the inter-dunal swales in this reach are generally freshwater. Characteristic vegetation includes the common reed, freshwater rushes, sedges and grasses, sphagnum moss and cranberry (TNC, 1978; Johnson, 1985). Distinct from the *Perched Water Table* wetlands to the east, these wetlands are *True Groundwater* systems. Not only do these systems provide important habitat for fish and wildlife (see TOEH, 1991), they also serve to absorb flood waters and thereby dissipate the impact of significant storm events.

The two most significant threats to the ecological systems in this reach are the extension of public water to the area and sea level rise. The most generalized impact of both events will be an overall increase in the amount and extent of existing wetlands. However, intrusion of salt water from sea level rise may transform freshwater wetlands to marine.

Recharge of imported public water to this area is likely to result in a higher freshwater table thus producing new freshwater wetlands and expanding existing ones. Many other impacts of the input of public water to Reach 4 are addressed in the Final Environmental Impact Study (TOEH, 1986) concerning extension of public water to Napeague. The reader is directed to that study for specific impacts to water quality, wetlands and other issues.

Reach 11 - Wainscott

Reach 11 includes Wainscott and Georgica Ponds and extends along the ocean beach from the western boundary of the Village of East Hampton to the Town line. Wetlands in Reach 11 include *Flooded Deciduous, Emergent Freshwater Marsh* and *Floating Aquatic* systems concentrated in the Georgica Cove area.

Wainscott Pond is a largely fresh *Coastal Pond* and is classified as C by the NYS DEC. This lower standard may result from surrounding agricultural land use. Approximately 80 per cent of the pond is surrounded by farmland with an *Emergent Freshwater Marsh* and wetland buffer most richly expressed along the southeastern shore.

Like Oyster Pond in Reach 7, Georgica Pond is a *Coastal Pond* separated from the ocean by a barrier beach which is breached periodically by storms, in addition to semi-annual openings by the Town Trustees. Unlike Oyster Pond, Georgica Pond is surrounded by developed property and the manmade channel is cut through the barrier beach, or gut, periodically to improve flushing, allow migration of anadromous fish and shellfish and, incidentally, to prevent flooding. If this channel were not opened periodically, Georgica Pond would be a predominantly freshwater system. The

channel provides at least twice yearly exchange with the ocean. The surface water quality is, therefore, classified as marine and is designated as SA.

Some of the drainage inputs to Georgica Pond are not within the Town's jurisdiction and are either in the Village or on private roads. One such input that is particularly large is the outflow pipe into Georgica Cove that drains from Route 114. The town should explore a multi-jurisdictional effort to reduce, improve or otherwise reduce this input (see **Projects**).

Of particular concern in the Town are road ends and pipes at the north end of the pond where the hydraulic gradient is very steep and culverts from the Georgica Association Road may be draining agricultural runoff into the Pond. The Wainscott Citizens Committee has identified additional sites in need of road runoff control before entering Wainscott or Georgica Ponds.

Reach 12 - Gardiners Island
Gardiners Island comprises Reach 12 and is surrounded by Gardiners Bay and Block Island Sound.

The surface waters and wetlands on the island are virtually untouched by development. Four *Coastal Ponds*, Great Pond, Tobaccolot Pond , Home Pond and Bostwick Creek are classified SA by the NYS DEC. Such high water quality supports rare and endangered fauna and provides migratory stopover, over-wintering and pristine breeding areas for varied wildlife species. Ten other *Estuarine* ponds and associated tributaries are found on the island and are all classified as SC by the NYS DEC.

Fifteen *Fresh Ponds and Streams* on the island are classified as D by NYS DEC. This low rating reflects the unsuitability of such shallow ponds to human-related recreation rather than poor water quality for wildlife. For instance, the *Perched Water Table Ponds and Streams* and the *Downs* site types on Gardiners Island were given the highest ratings for unique or exceptional habitat, migratory stopover areas, areas of scientific interest or research and observably pristine communities in the 1984 Comprehensive Plan (TOEH, 1984).

D. DREDGING - INVENTORY AND ANALYSIS

1. Introduction

Dredging within the waterfront area is performed for both public and private interests. Dredging of navigation channels deemed in the public interest is conducted by Suffolk County or, in the case of the Lake Montauk federal channel, by the US Army Corps of Engineers (ACOE). In the harbors and inlets basins of private marinas are dredged by the affected landowners. In addition to navigation, dredging is done to increase flushing and turnover of inner harbors, to remove contaminants or dilute existing contaminant loading, and to increase salinity. In all cases, environmental impacts associated with the dredging operation and the dredge spoil removal must be weighed against the social and economic impacts associated with not dredging, for example, navigational hazards, resuspension of contaminants and introduction of predatory saltwater species. The Town Trustees are the owners of the dredge spoil removed from their bottomlands. Any dredging project proposed for Trustee bottomlands requires Town Trustee approval.

2. Public Interest Dredging Operations

Suffolk County has developed several criteria for determining whether public or private interests benefit from a dredging project (SCPD, 1985). These criteria include, but are not limited to, public access points and public uses such as utilities and industry. Five sites in the Town of East Hampton presently meet these criteria and are dredged through the use of public funds. They are Accabonac Harbor, Lake Montauk, Napeague Harbor, Northwest Harbor and Three Mile Harbor. Two of these sites, Lake Montauk and Three Mile Harbor, are designated as high priority projects. However, dredging operations by the County have been curtailed in recent years, and even though the Three Mile Harbor channel, in particular, has severe shoaling, the County has not performed maintenance dredging there in over twenty years.

Table XII-7, page XII-34, (adapted from SCPD, 1985, and updated 1998) summarizes the public dredging operations conducted in the Town of East Hampton since the County began dredging in 1949. The quantities of material dredged have generally decreased in the last two decades as compared to the 1950's and 1960's. This is a reflection of stricter regulations protecting tidal wetlands from becoming dredge disposal sites, less available upland and a shift from channel modification to channel maintenance.

3. Private Interest Dredging Operations

Dredging operations conducted by private interests are concerned with marina or boat basin depth and small inlet maintenance. Quantities of dredge spoil approved for disposal under the Town's Natural Resources Special Permit process range from a few hundred cubic yards to 10,000 cubic yards over a ten-year period. However, the average amount removed is less than 1,500 cubic yards. It is anticipated that these average amounts will decrease in the future with installation of stormwater retention basins that trap sediments before they reach surface waters (see Stormwater Abatement in Introduction).

Methods of spoil disposal vary according to site conditions. Spoil is regularly tested for contamination as part of the Natural Resources Special Permit review process, particularly from marina basins. When contaminated, spoil must be disposed of offsite outside the Town.

Uncontaminated spoil is used in a number of ways including regrading and fill, backfill behind bulkheads, or for beach and dune nourishment. Clean spoil deposits have been used to augment habitat areas for shorebirds including the piping plover. Some spoil applications require planting of appropriate vegetation to minimize further erosion and siltation.

4. Environmental Impacts of Dredging and Dredge Spoil Disposal

Dredging and disposing of dredge spoil has physical, chemical and biological impacts on the environment. Physical impacts include changes in bottom topography, increased turbidity, and changes in the properties of sediments at the dredging and spoil disposal location. Chemical impacts include release of contaminants that may have been trapped in sediments, decreased oxygen levels in the water column and increased concentrations of nutrients. Biological impacts include destruction of habitats such as wetlands, shellfish beds, fin and shellfish spawning grounds and eel grass beds. Benthic sessile organisms can be buried, and filter feeders which consume suspended

contaminants can bioaccumulate them throughout the food chain. Physical and biological impacts can also interact, for example, accumulation of macrophytic vegetation in a deeper basin, ultimately resulting in anaerobic conditions.

For these reasons, dredging conducted with public funds and permitted by the Town by private interests should be the minimum necessary to maintain navigational safety, increase natural flushing and/or remove contaminants. The timing of dredging operations should be synchronized with the least critical periods of biological productivity; e.g., nesting or spawning. The period between September 15 and April 15 is usually the time of lowest sensitivity for reproduction. However, site specific conditions should be assessed on a case-by-case basis. For instance, winter flounder spawn in Lake Montauk between late January and June. Finally, the choice of spoil sites should take critical habitat and resuspension of contaminants into consideration. The Town should consider organizing an inter-agency workshop to consider environmental impacts of dredging with regulators, contractors and harbor interests.

Table XII-8 provides a descriptive comparison of dredge spoil disposal alternatives. The costs and constraints associated with each alternative are provided along with an indication of their frequency of use in East Hampton. Water Resources Maps XII-2A/-2B, identifies the location of recommended future dredge spoil disposal sites in the Town.

5. Dredging Analysis by Reach

Reach 1 - Northwest

Dredging in Reach 1 is confined to the inlet that provides access from Northwest Harbor to the estuary of Northwest Creek. A Town boat ramp, a Trustee mooring area, and a County dock are located in the inner harbor. This area is considered a public interest project by Suffolk County and is dredged by the Department of Public Works.

In 1961, the inlet was moved from a location at the east side of the harbor mouth to its present location on the west side of the channel; 357,000 cubic yards were dredged. The dredge spoil was used to close the original inlet and also placed on the barrier spit. Maintenance dredging has occurred twice since then, in 1965 and 1971, and the spoil has been placed on the barrier spit to the east and on the beach to the west. The spoil is clean sand and both spoil sites provide nesting habitat for colonial waterbirds.

Maintenance dredging was performed by the County in 1995 on the Northwest Creek channel, which had shoaled to the point of near impassability. The Town and County should consider reopening the original east channel, or instituting a two-channel inlet as at Hicks Island in Napeague Harbor, to improve circulation and prevent the rapid shoaling that has occurred in recent years (see **Significant Habitats Policy #7 and Flooding and Erosion Policies #11-17**). As shown on Water Resources Maps XII-2A/-2B, future spoil should not be placed on the spit, which is already built up, but placed on the west side of Barcelona Neck to lessen erosion and nourish the beach. Any disposal of dredge spoil at that site requires Town Trustee approval.

Reach 2 - Three Mile Harbor/Hog Creek
Public dredging projects in Reach 2 are required to maintain a navigable inlet to Three Mile Harbor, the channel within the harbor, and to maintain water quality with adequate flushing. Three Mile Harbor is the Town's second busiest center for the marine industry, and harbors a large number of resident and transient recreational boats in a wide range of sizes.

The channel goes all the way to the southern end of the harbor and periodic dredging is conducted where shoaling occurs. The Town proposed that the next County dredging project also deepen the channel to the east at the north end, known as Goose Creek, to increase flushing and circulation in the northeast portion of the harbor.

The south end of the channel was dredged in 1996, and in 1997 the Town contracted with the County to dredge the boat basin around Town Dock at the head of the harbor. At the time, the Town also requested the County to perform emergency dredging of the channel in the area opposite the Town Commercial Dock at Gann Road, where shoaling has caused several boats to run aground. Numerous complaints of shoaling in the channel near the mouth of the harbor have been heard in recent years, with requests to the County for maintenance dredging. The channel was dredged in the late spring and early summer of 1999, with spoil deposited in a large basin dug at Sammy's Beach.

In the past, spoil from the channel has been deposited on both sides of the inlet, at Sammys Beach and Maidstone Park, and at a designated spoil site at Marina Lane. This site receives spoil from the rest of the dredging projects in the harbor, and the Town is considering other compatible uses for it (see **Projects**). After the material has drained, the spoil from this site has been used for beach nourishment or dune enhancement. Some sand has been sold for this purpose by the Town Trustees, and it is sometimes used by the Town Highway Department. Future sites for spoil deposition are noted on Water Resources Maps XII-2A/-2B.

Private dredging is conducted at 12 marinas in Reach 2, 10 in Three Mile Harbor and 2 in Hog Creek. Two of the marinas in the reach are operated by the Town, at the Town Dock and the Commercial Dock. Maintenance dredging is conducted periodically to maintain sufficient draft for vessel use. The marinas are concentrated along the southern and eastern shores of Three Mile Harbor in areas of limited flushing and intensive upland residential use. Dredging is limited to periods of low biological productivity and according to site specific conditions, as evaluated in the Natural Resources Special Permit process.

Reach 3 - Accabonac Harbor
Publicly funded dredging of the Accabonac Harbor channel and boat basin are the only dredging activities in the reach. Fresh Pond is not dredged, although the Trustees have opened the gut to Gardiner's Bay periodically to improve water quality, and have applied to dredge the gut and remove or shorten the inlet groins to reduce shoaling.

In 1959 public funds were used to relocate the Accabonac Harbor inlet from 1/4-mile south of its present location near the present-day boat ramp on Louse Point Road. 205,000 cubic yards of dredged spoil was used to fill in the old channel and to extend Louse Point northward.

Maintenance dredging is conducted periodically (see Table XII-7) to remove material in Accabonac Harbor that is deposited at a shoaling rate of 3,850 cubic yards/annually (SCPD, 1987). Approximately two-thirds of the spoil from a 1985 channel dredging operation was added to two diked areas on Gerard Drive in order to create an area suitable for tern and piping plover nesting. The remaining third was added to Louse Point for the same purposes. Permits restrict dredging during the April to mid-August nesting period for least terns and piping plovers. Future spoil from Accabonac Harbor dredging should be used to nourish beaches south of Louse Point (see Water Resources Maps XII-2A/-2B). Any disposal of dredge spoil at that site requires Town Trustee approval.

Remnants of a sluice that formerly connected the northern section of Accabonac Harbor to the bay, under what is now Gerard Drive, are also indicative of the changes wrought by humans around this harbor. There should be a study to consider relocating the channel, and opening or reopening a sluiceway in the northern portion of the harbor to improve flushing. Further study is also warranted to determine whether dredging the silty muck sediments from the northern portion of Accabonac Harbor would increase flushing, circulation and biological productivity. Town Trustees support restoring the Accabonac Harbor channel to its original location and reopening the north end sluice along Gerard Drive.

Reach 4 - Napeague North

There are two current dredging locations in Reach 4, publicly funded dredging of the channel to Napeague Harbor, and private dredging of the boat basin and channel serving the Devon Yacht Club.

Access to Napeague Harbor is maintained by dredging the western inlet at Hicks Island. Spoil is used for beach nourishment on Hicks Island, and in the past, has been deposited on Goff Point to the east. Hicks Island has historically been a breeding area for the federally endangered roseate tern and the federally threatened piping plover. In future maintenance dredging projects, spoil should be considered for beach nourishment along Shore Road at Lazy Point (see Water Resources Maps XII-2A/-2B).

The inlet gives access to and from the harbor and allows boaters to use the Town boat ramp at Lazy Point. The channel should be dredged to a depth no greater than six feet below mean low water due to the environmental sensitivity of this area and the shallow draft of most boats using it.

Maintenance dredging is conducted by Devon Yacht Club on a regular basis. Dredge spoil has been placed to the south of the channel for beach nourishment, but should be available for use in other more essential areas, such as immediately to the north along Cross Highway (see **Flooding and Erosion Policies #11-17**).

Reach 5 - Hither Woods/Fort Pond Bay

There is no channel in Fort Pond Bay, as adequate deep water exists near shore for a wide variety of boating activities. In addition, the north shore of Hither Woods, at the west end of Reach 5, is entirely public parkland. Thus, there is no dredging in Reach 5 nor is any anticipated.

Reach 6 - Lake Montauk

Lake Montauk, or Great Pond, was historically a freshwater embayment subject to infrequent saltwater influx. Severe storms periodically breached the barrier spit that protected the northern shoreline. This northern spit was permanently opened in 1926 when two parallel stone jetties were installed 500 feet apart to make a permanent inlet. In 1927, the entrance channel between these jetties was dredged to a depth of 15 feet. A yacht basin in present day Coonsfoot Cove was also dredged at that time to a depth of 15 feet, and the spoil used to build up Star Island and connect it to the mainland.

Maintenance dredging of the Montauk inlet was conducted by Suffolk County between 1949 and 1974. Since that time the inlet has been maintained by the Army Corps of Engineers as a federal channel (see Table XII-7). Reach 6 has the highest concentration of private and commercial marinas in the Town, and dredging is conducted frequently in boat basins and adjacent to piers and bulkheads to maintain sufficient draft for yachts.

There has been no dredging south of Star Island for many years. The south Lake area is a designated State Significant Coastal Fish and Wildlife Habitat (see **Significant Habitats Policy #7**) dredging to allow deeper draft boats south of Star Island should be prohibited, due also to the restricted water circulation patterns in this portion of the Lake and deteriorating water quality conditions.

Although in the past spoil deposits have been placed on Star Island and the beach east of the jetties, the only active spoil disposal site for the Lake Montauk area is along the beach just to the west of the western jetty. This site should continue to receive any available spoil. Spoil nourishes the beach and spoil disposal easements have been granted by property owners for west of the jetty. There is virtually unlimited capacity at this site due to the scouring effect of the jetty. See **Flooding and Erosion Policies #11-17**. Spoil from public dredging of the channel is placed west of the jetty, as well as that from some private marina basin dredging operations. The remainder of spoil from private marinas is disposed of on-site or, depending on contaminant levels, in an acceptable landfill.

Reaches 7, 8, 9 and 10 - Atlantic Shoreline

These reaches comprise the Atlantic Ocean shoreline. There are no inlets, barrier beaches or embayments to be dredged. No public or private dredging projects are contemplated in Reaches 7, 8, 9 or 10.

Reach 11 - Wainscott

The barrier beach separating Georgica Pond from the Atlantic Ocean is opened semi-annually by the Town Trustees and is periodically breached by storms. These openings increase flushing, decrease flooding on surrounding properties, and allow for spawning and migration of anadromous fish species, blue claw crabs, etc. (TOEH, 1991). See also **Significant Habitats Policy #7 and Flooding and Erosion Policies #11-17**.

A proposal to dredge 150,000 cubic yards from flats near the Georgica Pond gut was proposed by the Town Trustees and approved by the Town Board, by resolution dated August 18, 1989. The Suffolk County Department of Public Works proposed to undertake the project, to dredge 150,000

cubic yards of sand flat and channel at the south end of the pond in order to facilitate the seasonal "letting" of the pond. Dredge spoil was to be used as beach nourishment for approximately 3,000 feet to the west. The project has not been funded. If it is reactivated, a SEQRA review should be undertaken.

Reach 12 - Gardiners Island

The only regularly dredging on Gardiners Island is a boat basin to the southeast of Home Pond. The most recent dredging operation occurred in 1989 and dredge spoil was deposited on the south side of the inlet. Spoil has previously been deposited on the north side of the harbor inlet and southeast of the inlet in the upland resulting in the creation of wetlands. All dredging on Gardiners Island has been private.

Table XII-5: Summary of Public Dredging Projects in the Town of East Hampton

Project Name	Dates Dredged	Cu. Yds. Dredged	Method of Spoil Disposal	Types of Water Dependent Facilities
Reach 1 Northwest Creek	1961 1965 1971 1995	357,000 49,000 18,000 20,000	Modified inlet orientation and placed spoil on barrier spit	Town launch ramp and informal mooring
Reach 2 Three Mile Harbor	1958 1961 1965 1974 1975 1996	82,000 35,000 106,000 83,000 90,000 21,000	Beach nourishment on both sides of inlet, upland spoil site at Marina Lane	10 marinas, Town commercial fishing dock, 3 Town launch ramps, slips at Town facility
Reach 3 Accabonac Harbor	1959 1965 1971 1976 1985 1989 1993 1996	205,000 74,000 17,000 30,000 30,000 15,000 11,000 14,000	Modify inlet location Beach and dune nourishment	2 Town launch ramps
Fresh Pond	Proposed	?	Fresh Pond inlet	Pond flushing

Project Name	Dates Dredged	Cu. Yds. Dredged	Method of Spoil Disposal	Types of Water Dependent Facilities
Reach 4 **Napeague** **Harbor**	1967 1987 1989	342,000 35,000 26,000	Upland on Hicks Island, beach nourishment	Town launch ramp
Reach 6 **Lake Montauk**				
Inlet	1926	?	Star Island ?	2 stone jetties, 500' apart
Entrance chnl.	1927	?	?	
Yacht Basin	1949	40,000	Upland on Suffolk	
Inlet	1959	100,000	Cty parkland and	Town commercial
	1969	110,385	offshore; beach	fishing dock, commercial
Boat Basin	1974	65,000	nourishment west	docks, 12 marinas,
	1976	25,933	of jetty	charter boat operations,
Inlet	1984	21,876	Upland (east of	Town launch ramp
Inlet	1987	5,800	jetty)	
Inlet	1991	15,307	Upland (west of	
Inlet+ CG Sta	1995	46,175	jetty)	
Inlet			Upland (west of jetty)	
			Upland (west of jetty	
			Upland (west of jetty	
Reach 11 **Georgica Pond**	Proposed	150,000	Beach nourishment	Anadromous fish migration; pond flushing; flood control

Table XII-6: Alternative Dredge Spoil Disposal Options

Type	Alternative Sites	Costs/Constraints	Frequency of Implementation in East Hampton
Open Water	a) deep ocean b) near shore c) in river/harbor	depends on transport distance; resuspension of sediments; transport barges often too large for local waterways; wastes clear resource	rare
Upland (excluding beach)	a) no further use intended b) for construction c) for habitat/recreation development	compatibility and future site management; legal right to use site; transport costs; cost of dikes; weir containment structures; dewatering requirements' contamination in dredge spoil; for habitat may require revegetation (e.g. no vegetation required for nesting habitat enhancement); erosion and siltation	common on dunes and after temporary disposal and curing
Beach Restoration		requires clean or detoxified material of sufficient grain size to limit resuspension; transport distance; must be similar in grain size to receiving beach	commonly used for public harbor inlet dredging projects and clean private spoil
Landfill		high cost; large quantities use up valuable space in lined cells of landfill; local landfills closed	sometimes required for contaminants from marina basins

Alternative Methods

Containment	a) construction b) for habitat or recreation	cost of dike and weir construction; generally limited to large projects	sometimes used for private disposal (e.g. as backfill behind a bulkhead after curing and drying)
Incineration		extremely high cost	rare
Resource Reclamation	a) duck sludge b) chemical	high costs associated with chemical nutrient recovery, waste lagoons landfill cover, soil enhancer	uncommon in East Hampton

E. GROUNDWATER RESOURCES - INVENTORY AND ANALYSIS

1. Introduction

The sole source of drinking water in East Hampton is its groundwater. On the South Fork, groundwater is recharged singularly by infiltration of precipitation through the unsaturated zone to the water table. From an approximate yearly rainfall of 45 inches, roughly half is recharged into the groundwater reservoir and the remainder is lost to evapotranspiration, seepage into waterbodies, subsurface outflow, flow of coastal springs and surface runoff. These proportions vary over time and space depending on precipitation type, frequency and intensity; slope of the land surface; soil permeability and soil moisture content; amount and kind of vegetative cover; and air temperature (Nemickas and Koszalka, 1982).

At the onset, this overview describes the basic principles of groundwater hydrology including aquifers, recharge and movement of groundwater and the location of the fresh water to saline water interface as predicted by the Ghyben-Herzberg principle. Major threats to groundwater quality and, to a lesser extent, quantity are described. Finally, a review of existing means to protect and regulate groundwater is provided.

It is important to recognize that theoretical relationships about groundwater location, movement and quantity are not as strictly applicable on the South Fork as on the main body of Long Island. For instance, the reliability of the Ghyben-Herzberg relationship, that predicts the thickness of the freshwater lens, breaks down completely in many of the low lying coastal areas found in the town. In addition, the aquifer in the Montauk Point area is relatively thin and extends only 90-100 feet below mean sea level. (AIPG, 1985).

2. Aquifers

Aquifers are geologic formations (rock layers), that can yield economic quantities of water. Aquifers can be very thin or hundreds of feet thick and can underlie a few acres or thousands of square miles.

On Long Island, these formations are composed primarily of sand and gravel. Water is stored between the particles that make up the formation and can move easily through it. Long Island has three major aquifers that are separated by layers of clay and silt. Water moves so slowly through the clay layers that they effectively separate the three aquifers from one another. The three aquifers serve as a storage area for large quantities of water and as a very slow-moving conduit which transmits water from areas where it enters the ground to points of discharge.

In descending order, the major aquifers on Long Island are the Upper Glacial, located in the Ronkonkoma moraine (in places there are two aquifers in this formation), the Magothy, located in a sand layer deposited during the Cretaceous, and the Lloyd, another sand layer that overlies bedrock.

3. Recharge: Fresh/Saltwater Interface

On the South Fork, only the upper two aquifers contain fresh- water and, in many areas of the town, only the Upper Glacial aquifer contains significant quantities of freshwater. The lower aquifer, the Lloyd, contains freshwater on western Long Island and salt water here. This difference results primarily from the properties of freshwater, the relative heights of the land above sea level in the two areas, and thus the location of the freshwater to saline water interface. This interface can be predicted by the Ghyben-Herzberg principle which predicts the height of the freshwater table above and below sea level based on the relative densities of fresh and salt water. This principle predicts that freshwater will extend 40 feet below sea level for every foot that the water table rises above sea level. The height of the water table tends to mirror the height of the surface of the land. Thus the areas of highest elevation on the land surface contain the deepest lens of freshwater. Land elevation on western Long Island is significantly greater than on the South Fork. The result is a deeper lens of freshwater on western Long Island that penetrates the deepest aquifer, the Lloyd.

The deepest groundwater recharge in East Hampton extends part way into the Magothy aquifer. Thus drinking water supplies are limited to the Upper Glacial and portions of the Magothy aquifers. The deep flow recharge areas are located in the central portion of the South Fork. Movement within the aquifers is lateral and vertical. In the deep recharge areas, water moves predominantly downwards and to a lesser extent laterally. Since the quantity of water is great and the movement slow, this water, if contaminated, would remain so for decades. Closer to the coastal areas, elevation drops, the lens is thinner and movement is predominantly lateral. Freshwater moves toward shallow flow streams and discharges directly to the ocean and bays across the freshwater-saline interface.

As noted above, the thickness and depth of the freshwater lens does not conform to theoretical norms in coastal areas. For instance, where the edge of the freshwater lens is low and gently sloped, the area of contact between freshwater and saline is broad and thick. Thus, in areas like Sammy's Beach (Reach 2) and Gerard Drive (Reach 3), this kind of low, gently sloping freshwater lens is highly susceptible to salt water intrusion especially when many wells are pumping from the aquifer. Where the lens is steep and high, the area where freshwater mixes with saline is more sharply defined and located closer to the sea. Thus, in Wainscott (Reach 11), a steep and thick freshwater lens meets saline water in a narrow band seaward of the dunes.

Most of the Town's waterfront areas obtain drinking water from private wells. In the Town's Water Resources Management Plan (TOEH, 1987) on-site wells servicing one residence are classified as private wells. On-site wells serving at least five connections to non-residential or seasonal residences are classified as non-community wells. Non-community wells serve a variety of land uses including: motels, hotels, cooperatives, recreational facilities, government structures, commercial uses and industrial uses. Most of the 84 non-community wells inventoried in East Hampton for the Water Resources Management Plan are located within the coastal zone. Parts of East Hampton north of the airport and along Route 114, and of Montauk and Amagansett are served by public water. Public mains have been extended through the Napeague area to Montauk, and to the Landfall area of Northwest to remedy chronic salt water intrusion and contamination problems, respectively.

4. Threats/Contamination

Further west on Long Island, the Upper Glacial and portions of the Magothy aquifers have been contaminated by high density development and improper waste disposal practices of the past. Drinking water must be drawn from the areas of the Magothy aquifer that remain uncontaminated and from the Lloyd aquifer. On the South Fork the lower portions of the Magothy contain salt water. Drinking water must be drawn from aquifers that are relatively near the surface. Contamination cannot be isolated from lower reservoirs in the aquifer, because there are no lower freshwater reservoirs.

Several areas of the upper aquifer are already contaminated with agricultural pesticides. Fortunately, most agricultural activity has occurred on the outwash plain where the aquifer is relatively shallow and flows toward the ocean. Water quality improvement districts in these areas are the preferred course of action, and are preferable to public water. However, in the future the extension of public water mains may still be required, at a considerable cost to the taxpayer.

Existing threats of contamination to the groundwater resources in East Hampton include nitrates and coliform from septic waste, pesticides, fertilizers, household toxic chemicals, landfill leachates, commercial and industrial discharges, leaking underground fuel storage tanks and salt water intrusion.

In coastal areas this groundwater contamination poses a threat to surface water quality because research indicates that nitrogen is generally not removed by conventional on-site septic systems (Nixon, 1982). In addition bacteria and viruses are capable of traveling rapidly over considerable distances in the highly permeable soils (Heufelder, 1988) such as those found along the sandy shorelines.

Near the waterfront, the shallower lens of freshwater holds less water. In these areas, the Upper Glacial aquifer is in direct contact with the ocean or bay floor at the shore and extends seaward, in contact with seawater offshore. Ordinarily, freshwater moves through the aquifer toward the sea, but if pumping on land is too great, salt water is drawn toward wells on the land. This phenomena, known as salt water intrusion, is a problem in portions of Reaches 1, 2, 3, 4, 5, 6, 8, 9 and 10.

5. Regulation/Protection

Several hydrogeologic zones define groundwater flow and its quality across Long Island. The major store of potable water is located in the western portion of the town in Hydrogeologic Zone V. This zone has been designated as deep flow recharge by the Suffolk County Sanitary Code, Article 7 Regulations. The remainder of the East Hampton groundwater supply is located in Hydrogeologic Zone IV. The entire LWRP coastal area is contained within Hydrogeologic Zone IV. In this zone, almost all of the freshwater is situated above the Magothy within the Upper Glacial aquifers. Potable freshwater is plentiful in regions where morainal deposits have created high elevations, ranging to virtually non-existent in low-lying areas close to sea level.

Particular areas of the Town are designated as Water Recharge Overlay Districts. They are illustrated on the official Town Zoning Map and on Water Resources Maps XII-2A/-2B. Regulations in these districts limit clearing of existing native vegetation, amount of fertilization and the use of certain chemicals, and mandate clustered development.

Certain regions of the Town have been designated as Pine Barrens and are under the jurisdiction of the Suffolk County Planning Commission. The Suffolk County Planning Commission reviews development within the designated Pine Barrens areas to protect the underlying water supply and ecology.

When proposals for new development are reviewed, septic systems must meet minimum setback requirements (150 feet from wetlands and surface waters) and SCDHS regulations require a minimum of three feet separation between the water table and the bottom of the discharge points. However, studies (Reveau, 1978; Brown et al, 1977; Hagedorn et al, 1978; Aulenback et al, 1975) reviewed in Brown, 1980 concluded that in Pinelands soils a minimum of 120 cm (approximately four feet) is required between the discharge point and the groundwater table.

The high sand and low clay content of Pinelands soils are very similar to the sandy soils near the shore in Reaches 1, 2, 3, 4, 10 and 11 of the coastal area. These coarse-textured soils facilitate movement of contaminants, bacteria and viruses. In addition, groundwater elevations in coastal areas fluctuate with daily and monthly tidal cycles and seasonal and annual precipitation trends. Maintaining adequate separation between leaching pools and the water table according to the range of anticipated conditions is not always achieved. The increased coliform bacteria contamination found in the harbors of these Reaches and resultant closures of bottomlands to shellfishing suggest that the three foot separation distance required by the Health Department is insufficient to keep septic effluent from reaching groundwater and contaminating adjacent surface waters. Consequently, the Town requires a four foot separation to groundwater within the *Harbor Protection Overlay District* (see **Appendix C** and **Development Policies #1-6**).

When lots with existing septic systems are reviewed for redevelopment, old faulty septic systems are often relocated to an area that maximizes wetland setbacks. On some of these lots and on other undeveloped lots that cannot meet current setback standards there is a need for innovative sanitary systems that do not discharge septic waste to the subsurface. In many of these cases depth to seasonal high groundwater is less than the 4 feet needed to protect groundwater, and surface water

setbacks cannot be realized either. Public funding is insufficient to purchase all such parcels, and innovative systems are needed to minimize current and future inputs of nitrates and coliform bacteria to surface waters. This approach must be pragmatic and not be allowed to encourage new development in sensitive, waterfront environments. Rather, it should be utilized to correct and limit sources of pollutants. Innovative sanitary systems are also needed for public facilities in areas near the shore such as bathing beaches and public access points to the waterfront.

6. Groundwater Analysis by Reach

Reach 1 - Northwest

Reach one is mostly parkland, contains very little development and is bordered on the south by a Town Water Recharge Overlay District. As a result, water is of good quality in this region. However, the water table is shallower on the northern half of the South Fork than the Ghyben-Herzberg relationship would indicate (Nemickas and Koszalka, 1982). Thus, if density permitted under current zoning were to increase, the water supply would be vulnerable to salt water intrusion.

Indeed, test wells in Northwest Harbor County Park (located at the Northwest Creek boat launching ramp) indicated high levels of chloride (Cl) manganese (Mn) and iron (Fe) in sampling from 1973 and 1982. Chloride, in particular, was rising steadily between 1978 and 1982, indicating salt water intrusion in the areas around Northwest Creek (LIRPB, 1983).

There are extensive areas surrounding Northwest Creek, Alewife Brook and the shore of Northwest Harbor which have seasonal high groundwater levels less than 4-feet below the surface (LIRPB, 1983). High groundwater levels such as this pose significant constraints for development. For instance, drainage structures and septic systems cannot function effectively and structural foundations must be raised to prevent flooding.

The majority of the groundwater in Reach 1 is recharged in areas inland of the coastal area boundary and discharged into the brackish wetlands surrounding Northwest Creek, several groundwater ponds and the surface waters of Northwest Creek and Alewife Brook. However, the western portion of this Reach contains Barcelona Neck. A potable groundwater lens beneath Barcelona Neck is an isolated island of water surrounded by saline groundwater.

Reach 2 - Three Mile Harbor/Hog Creek

Groundwater which is recharged from the interior region north of the groundwater divide flows north into Three Mile Harbor and Gardiners Bay. This groundwater supplies much of the freshwater reaching the harbor.

There are two areas within this reach where groundwater quality is degraded. These include Sammy's Beach and the headwaters near the southern portion of the harbor (Soak Hides Creek). Sammy's Beach, a baymouth spit at the northern entrance to Three Mile Harbor, is vulnerable to salt water intrusion. In addition, a well on Sammy's Beach Road, exceeded the 10 parts per million (ppm) standard for nitrate with a level of 20 ppm in 1983 (SCDP, 1983). These are significant

constraints, which contribute to the Town's view that new development in such areas should be minimized (see also **Flooding and Erosion Policies #11-17**).

In the Soak Hides/Springy Banks area at the southern end of Three Mile Harbor, coliform contamination affects well water and surface water quality in the harbor. This contamination results from a combination of two factors, dense residential development and a groundwater underflow of very high hydraulic potential. Deep water recharge areas are located upland of the Springy Banks area and the drop in elevation from deep recharge to surface water discharge is steep. The contour lines of the water table that describe the drop in hydraulic potential are very close together indicating a strong hydraulic pressure-head that entrains septic effluent and flushes it through the subsurface into the harbor. A test well, on Treescape Road in this area, exceeded the 2.2 MPN/100 ml standard for fecal coliform with a measured level of 15 MPN/100 ml (SCPD, 1983), reflecting the above description of contamination.

Closer to the head of the harbor, the depth to groundwater in the area surrounding Soak Hides Dreen is less than 4 feet. Older septic systems in this area sometimes sit directly in groundwater, carrying effluent directly into the harbor.

An additional source of contamination resulted from gasoline leaking from a service station near the intersection of Three Mile Harbor and Soak Hides Roads. Since late 1997, NYS DEC has been conducting a clean up effort to remove residual chemicals from groundwater in the area.

Reach 3 - Accabonac

Fresh groundwater in the area around Accabonac Harbor is entirely contained within the Upper Glacial aquifer. There are no public water mains in this region at present. Significant quantities of groundwater are recharged in the Stony Hill Road morainal deposits east of Accabonac Road. Groundwater flow is east/northeast toward Napeague Bay and Accabonac Harbor.

The groundwater quality is generally good except along the Gerard Drive and Louse Point Road spits that form the mouth of Accabonac Harbor. One private well located in this area exceeded the chloride standard of 250 mg/1 indicating salt water intrusion (SCPD, 1987). Alternative drinking water sources in this area include domestic water treatment systems (filtration), water delivery or bottled water.

A potential source of future contamination to groundwater and ultimately to surface waters in this reach is the leachate plume from the Town landfill on Accabonac Highway. Any migration of the plume would be toward the northeast and could reach Accabonac Harbor and contaminate private wells. To date, the extensive test well data has not indicated migration of the plume or contamination of private wells.

Another concern in this region is contamination from abandoned and antiquated fuel tanks. Three underground fuel tanks were leaking gasoline up-gradient of Pussy's Pond at the intersection of School Street and Springs-Fireplace Road (SCPD, 1987). These tanks were removed August 18, 1986 along with the contaminated soil around them.

Though located outside the coastal area, an unregulated golf course in the Stony Hill recharge area that flows to Springs is a potential source of groundwater contamination, due to the pesticides and fertilizers used for turf management.

Reach 4 - Napeague North

Almost all of Reach 4 is a sandy isthmus of land composed of beaches, stabilized duneland and brackish wetlands. Groundwater elevations are 1 - 3 feet above mean sea level. The freshwater lens is found in the Upper Glacial aquifer and is relatively thin: between 20 and 80 feet thick. It is extremely vulnerable to intrusion of salt water and other contaminants when freshwater is pumped out of the ground.

Water quality problems observed in Napeague during the summer of 1983 included elevated chloride, iron, manganese, ammonia and coliform bacteria levels (SCDHS, 1984). In one non-community water supply system, high levels of volatile organic compounds were observed. These compounds were produced when chlorine was added as a disinfectant resulting from salt water intrusion and septic waste discharge.

In 1987, public water mains were extended across Napeague from the west. Development along the southern portion of Napeague Harbor now utilizes public water. Lazy Point, on the north shore of Reach 4, is now served by public water as well, and Suffolk County Water Authority has constructed a pipeline to the area. An Environmental Impact Statement (EIS) was prepared by the Town to evaluate the potential impacts and identify mitigation measures for this project. Concerns included alteration of the water table and spread of non-native vegetation, especially *Phragmites*. Mitigation measures include monitoring of the areal extent of *Phragmites*, management of the spread of *Phragmites*, and/or management actions to protect the viability of Natural Heritage elements. The Town Board will direct that these activities be undertaken by the Town Department of Natural Resources in cooperation with the OPRHP.

Reach 5 -Hither Woods/Fort Pond Bay

The Montauk headland, rising east of the Napeague isthmus, is composed of morainal deposits, and contains freshwater supplies in the Upper Glacial aquifer. Indeed, Reach 5 contains the largest freshwater storage area in the Montauk region and the second major storage area in the Town. The thickness of the freshwater lens reaches over 100 feet (Nemickas and Koszalka, 1982) and the entire area north of Montauk Highway is now protected from any future development through public acquisition for watershed protection purposes. Suffolk County Water Authority has proposed a well field in this area, although a pipeline to the mainland through Napeague has been installed to increase the Montauk water supply. The findings statement for the SEQR review of the pipeline extension issued by the East Hampton Town Board requires the Suffolk County Water Authority to continue to maintain and replace its Montauk infrastructure and to develop a well field at Hither Woods, as economically feasible and reasonable, by the end of 2002.

Significant potential pollution to groundwater in Reach 5 could result from the former Montauk landfill. A leachate plume would flow northeast from the landfill into Block Island Sound. However, no plume or contamination has been detected to date from test well monitoring. At the eastern end

of Reach 5, there is fairly dense residential and commercial development surrounding Fort Pond. A tertiary sewage treatment plant discharging wastes to the subsurface from the Rough Riders condominium complex on Fort Pond Bay, and a tertiary disposal system at Montauk Manor are also potential sources of contaminants. Much of the area is served by public water.

Reach 6 - Lake Montauk

In Reach 6, freshwater is available only in the Upper Glacial aquifer and is entirely underlain by a zone of saline water (SCPD, 1981). Perched freshwater is common on the surface and at shallow depths (from 5 - 35 feet) due to the widespread layers of clay and silt. However, the major source of freshwater is an artesian aquifer below the clay layers (Nemickas and Koszalka, 1982).

The area west of Lake Montauk is generally served by public water obtained from several public wells (SCPD, 1981). As the population nearly triples in the peak summer season in Montauk, the operation of the Montauk public water supply system must be carefully managed. In 1997 the Suffolk County Water Authority issued a phase one water alert for Montauk. However, this measure alone was not sufficient to prevent the overpumping needed to meet Montauk's potable water supply. Since the development and implementation of the Town's Water Resources Management Plan (TOEH, 1987), there has been significant deterioration in the water quality in Montauk public water supply wells as indicated by increases in the levels of chlorides and iron. To supplement the water required to meet this peak demand and to prevent further deterioration of the Montauk wells from overpumping, the Suffolk County Water Authority has installed an approximately four-mile pipeline connecting the water lines in Montauk to the water supplies in western East Hampton.

Groundwater contamination may also have occurred from fertilizers used on the Montauk Downs Golf Course. NYS OPRHP, which manages the course, has introduced more native species [which require less fertilizer] and a program of integrated pest management (IPM) to reduce pesticide applications.

The eastern side of Lake Montauk is not served by public water. Although the freshwater lens reaches a thickness of up to 100 feet east of the lake, the regions bordering the shoreline of the lake have a thin freshwater lens.

Freshwater supplies on the entire Montauk peninsula are vulnerable to salt water intrusion due to the proximity of saline water on all sides and in Lake Montauk. Water from private wells in the Montauk area generally contains between 25 and 45 ppm chloride (SCPD, 1981). Concentrations in excess of 45 ppm indicate salt water intrusion and 250 mg/l exceeds the drinking water standard for chloride.

Reach 7 - Oyster Pond/North Montauk Point

The thickness of the freshwater mound is less than 50 feet in most of Reach 7. However, most of this area is parkland and no public water is drawn from the subsurface. Oyster Pond is fed by *True Groundwater Streams* and surface waters.

There is no public water in Reach 7 and no wells have been drilled to test water quality in the subsurface.

Reach 8 - Montauk Bluffs

The freshwater lens is approximately 50 feet thick in Reach 8 and extends roughly 2 feet above mean sea level. Groundwater flows primarily to the south and, to a lesser extent, to the north where it is discharged into Oyster Pond. Widespread thick clay layers in the subsurface have created many *Perched Wetlands* in this area. There are also many *Freshwater Seep Communities* along the bluff face as groundwater flows laterally above the clay layers. Discharge of sanitary wastes to the subsurface is impeded by the extensive clay layers. As a result, development in Reach 8 is restricted to low density residential and often requires extensive septic system excavations. Thus even where development is reduced by the vast network of wetlands in this area, these constraints still pose significant problems for disposal of wastes. Public acquisition of undeveloped parcels in this area will best protect the environmental integrity of wetland systems and also negate the need for public water importation or other services in the future.

Reach 9 - Hamlet of Montauk

In Montauk hamlet and the eastern portion of Reach 9, the freshwater lens varies from 50 to 100 feet thick. This area also contains many *Perched Wetlands* due to the clay layers that are characteristic of the Montauk peninsula. High volumes of stormwater runoff occurs via many manmade ditches and lateral groundwater seepage above confining layers of clay.

West of the hamlet, morainal deposits rise from elevations of between 15 and 50 feet to heights of 50 to 100 feet. The groundwater divide is located just north of the Montauk Highway (in the area known as Hither Woods). Groundwater flow in this area moves south from the divide toward the Atlantic Ocean.

The eastern portion of Reach 9 is predominantly served by public water that is recharged from regions north of Montauk Highway. Likewise, all developments in the hamlet of Montauk are served by public water. To the west of the hamlet, there is no public water service.

Existing threats to groundwater include subsurface contamination from fuel storage tanks and salt water intrusion. However, Article XII of the Suffolk County Sanitary Code required replacement of fuel storage tanks with double walled structures by January, 1991. Salt water intrusion toward public supply wells is minimized by limitations on pumping and maximization of distances between well fields (SCPD, 1981).

Reach 10 - Napeague South

Reach 10 stretches from the western limit of the Montauk headland, across the Napeague isthmus and includes the southern outwash plain of the Ronkonkoma moraine to the Village of East Hampton boundary. Except for the Hither Hills State Park campground which is served by a non-community well, the majority of Reach 10 is served by public water derived from sources west of the Napeague isthmus.

As noted in the discussion of Reach 4, water supply on the Napeague isthmus is limited and subject to contamination from septic systems and salt water intrusion when pumping demand is high. Water supply in the fragile double dunes area south of the outwash plain is also subject to salt water intrusion problems and septic contamination due to high density development. This area is also served by public water.

Reach 11 - Wainscott

The area of deepest groundwater recharge is located in the region north of the Town airport, up-gradient of Reach 11. Groundwater flow southward, toward Reach 11, is approximately 300-feet annually (TOEH, 1987). The freshwater lens is therefore quite thick, up to 350 feet thick, and extends through the Upper Glacial and into the top portions of the Magothy aquifers (Nemickas and Koszalka, 1982).

This high velocity groundwater flow also produces a relatively thick lens of freshwater near the shoreline. Thus, salt water intrusion is of negligible concern in this reach. To the contrary, the high velocity groundwater flow contributes so much freshwater to Georgica Pond that shoreside flooding is a recurrent problem in this area. There are a number of wells in the Wainscott area that are contaminated above EPA threshold levels for aldicarb (Temik), carboflouron and vydate (Holzmacher et al, 1986).

Reach 11 is not presently served by public water. Due to existing low density residential development and the presence of sensitive environmental features, the Water Resources Management Report (TOEH, 1987) has recommended the creation of a water quality treatment district in this area if potable water supplies experience further contamination.

Reach 12 - Gardiners Island

Very little information is available on the quality and quantity of groundwater supplies on Gardiners Island.

According to the Suffolk County Soil Survey, the high prevalence of Montauk soils indicates that Gardiners Island was formed as part of the Ronkonkoma Moraine. It is assumed that available drinking water is found only in the Upper Glacial aquifer. However, amounts have not been verified with field data. Nor is data is available on the quality of the groundwater on Gardiners Island. However, the island contains only one residence, an airstrip and several out buildings. No groundwater quality problems have been reported to date.

Similar to the Montauk subsurface, underlying clay layers have produced several *Perched Water Table Ponds and Streams* on the northeastern portion of the island. The zone of deepest groundwater recharge is located in the region of undulating topography situated on the northern portion of the island. Any future intensification of development would be severely constrained by poor septic drainage, high potential for salt water intrusion and limited pumping capacity due to confining clay layers.

F. WATER RESOURCES POLICIES #30-44

POLICY 30 MUNICIPAL, INDUSTRIAL, AND COMMERCIAL DISCHARGE OF POLLUTANTS INCLUDING BUT NOT LIMITED TO, TOXIC AND HAZARDOUS SUBSTANCES, INTO COASTAL WATERS WILL CONFORM TO STATE AND NATIONAL WATER QUALITY STANDARDS.

Explanation of policy:
Municipal, industrial, and commercial discharges of pollutants include not only "end-of-the-pipe" discharges into surface and groundwater but also site runoff, leaching, spillage, sludge, and other waste disposal, and drainage from raw material storage sites. The designated best use of all groundwater in Suffolk County is for public and private water supply, and of most surface waters for food production, bathing and recreation. The policy of the County of Suffolk and Town of East Hampton is to maintain water resources as near to their natural condition of purity as possible to safeguard public health and the local economy. To that end, all necessary steps shall be taken to prevent water pollution and improve water quality which has degraded.

Point Discharges from Municipal, Commercial or Industrial Sources
In the Town of East Hampton, there are no point discharges into surface waters from municipal, industrial, and commercial sources (excluding the sewage treatment plant in the Village of Sag Harbor) nor are they permitted. There are three point discharges into ground water from: two high density residential sources located in the Town's coastal area which include the tertiary sewage treatment plants at the Rough Riders Condominium (Reach 5) and the Montauk Manor Condominium (Reach 6); and the Montauk landfill (Reach 5) which has not generated a groundwater leachate plume. These discharges are regulated by NYS DEC and the SCDHS.

Non-Point Discharges from Municipal, Commercial or Industrial Sources
Non-point sources of pollution are discussed in the Surface Waters and Wetlands, Inventory and Analysis. Generally, the major contributors of non-point source pollution include:

- Road runoff and drainage containing oil, gas, animal waste, sediments and other organics.
- Overland runoff from residential, agricultural and recreational lands that contain fertilizers, herbicides and pesticides.
- Septic systems including grease traps and denitrification systems.
- Livestock, animal and waterfowl waste.
- Boat waste such as sewage, oil and fuel.
- Marina waste such as fueling facilities, boat maintenance and fish by-products.
- Drainage from vector control ditches.
- Commercial fish packing operations.

Surface waters most affected by this type of pollution and the reaches where they are found are as follows:

Reach	Waterbody	Suspected Problem Sources
1	Northwest Creek	Septic systems, wildlife road runoff
2	Three Mile Harbor	Septic systems, marina waste, boat waste, wildlife, road and overland runoff
	Hog Creek	Septic systems, road runoff
3	Accabonac Harbor	Septic systems, road runoff, wildlife, livestock
	Fresh Pond	Septic systems, road and overland runoff, wildlife
6	Lake Montauk	Septic systems, road and overland runoff, marina waste, boat waste, wildlife, commercial fish packing
7	Oyster Pond	Upland recreational use (campers, horses), wildlife, episodic septic & pollutant spills from Camp Hero
11	Georgica Pond	Septic systems, overland runoff, wildlife

POLICY 31 STATE COASTAL AREA POLICIES AND THE PURPOSES OF APPROVED LOCAL WATERFRONT REVITALIZATION PROGRAMS WILL BE CONSIDERED WHILE MODIFYING WATER QUALITY STANDARDS; HOWEVER, THOSE WATERS ALREADY OVERBURDENED WITH CONTAMINANTS WILL BE RECOGNIZED AS BEING A DEVELOPMENT CONSTRAINT.

Explanation of policy:
Pursuant to the Federal Clean Water Act of 1977 (PL95-217) the State has classified its coastal and other waters in terms of best usage (for the public) and has adopted water quality standards for each class of waters. These classifications and standards are reviewable at least every three years for possible revision or amendment. The Town of East Hampton Local Waterfront Revitalization Program and the State Coastal Management policies shall be factored into such a review. However, such consideration shall not be less restrictive than any water pollution control requirement established by the State pursuant to the Federal Clean Water Act.

Good water quality is essential for the continued use and enjoyment of the Town's coastal resources to support recreational and commercial activity and sustain the Town's economy. Water quality in several reaches has already been adversely impacted primarily by non-point source contaminants, particularly malfunctioning septic treatment systems and runoff containing pollutants. Of particular concern are the levels of total and fecal coliform bacteria used as an indicator to determine whether shellfish harvesting will be restricted to protect public health. Improving coastal water quality in areas where shellfish harvesting is restricted is a Town priority. Activities that would cause a decline in existing water quality shall be prohibited. The overall goal of this policy is to minimize

additional losses of bottomlands to shellfishing closures, and to reopen as many areas as possible that are presently closed.

Classifications of Saline Waters
Current classifications of all saline waters in the Town of East Hampton are listed in the Inventory and Analysis of Surface Waters and Wetlands and are shown on Water Resources Maps XII-2A/-2B.

Most of the State salt-water classifications are consistent with existing and proposed land and water uses. However, as indicated by shellfish area closures, the water quality in several salt-water bodies does not conform to NSSP standards. These include portions of the following harbors and bays. Existing State classifications are noted in parenthesis.

Reach 1	Northwest Creek (SA), Alewife Brook (SC)
Reach 2	Three Mile Harbor (SA), Hog Creek (SA)
Reach 3	Accabonac Harbor (SA)
Reach 6	Lake Montauk (SA)

Classifications of Fresh Waters
Current classifications of fresh waters in the Town of East Hampton are listed in the Inventory and Analysis of Surface Waters and Wetlands and are shown on Water Resources Maps XII-2A/-2B.

Most fresh-water classifications are consistent with existing and proposed land and water uses.

Water Quality Protection Efforts
Three major efforts are being taken to improve surface water quality so it is consistent with its current classification:

(1) Designation of vessel waste *No-Discharge Zones* (see **Policy #34**).

(2) Establishment of a *Harbor Protection Overlay District* (HPOD) to ensure compatible land use activity within watersheds of certain surface waters (see **Policy #37**).

(3) Establishment of a consistent water quality monitoring program to ensure that no additional areas will be closed for the harvest of shellfish (see **Projects**).

POLICY 32 ENCOURAGE THE USE OF ALTERNATIVE OR INNOVATIVE SANITARY WASTE SYSTEMS IN SMALL COMMUNITIES WHERE THE COSTS OF CONVENTIONAL FACILITIES ARE UNREASONABLY HIGH, GIVEN THE SIZE OF THE EXISTING TAX BASE OF THESE COMMUNITIES.

Explanation of policy:
In the waterfront study area, individual septic tank and leaching pool systems are used to treat sewage waste for nearly all residential and commercial development with the exception of several

residential and commercial denitrification systems and two tertiary sewage treatment plants serving the Rough Rider Condominium complex in Reach 5 and the Montauk Manor Condominium in Reach 6.

A description of physical environments where installation of conventional septic tank/leaching pool systems can be incompatible with soil conditions and can cause adverse impacts is discussed in Groundwater Resources.

The US EPA (1991) describes five management measures, along with their effectiveness and cost, to limit the discharges from conventional on site sewage disposal systems. These measures include:

(1) limiting phosphate in detergents,
(2) installing water conservation fixtures,
(3) eliminating garbage disposal use,
(4) proper design and maintenance that includes appropriate setbacks based on soil type and periodic pumping and inspection, and
(5) removal of nitrogen through:
(a) intermittent sand filters,
(b) upflow anaerobic filter and sand filter,
(c) wastewater separation of toilet waste (in holding tanks) and graywater (in a conventional system), or
(d) site density controls to limit total nitrogen loading. Some of these measures are included in the standards for the *Harbor Protection Overlay Protection District* (HPOD), **Appendix C**.

Other alternatives to conventional on-site septic systems are available or being developed. These include wastewater separation and holding tanks in combination with composting toilet systems, elevated sand mound, shallow pressure dosing trench, alternating fields, sand lined trench, sand filter trench, evapotranspiration systems, artificial wetlands, greenhouse systems, and bermed infiltration ponds (US EPA, 1991, and Coastal Technology Inc., 1991).

There remains a need for greater regulatory flexibility in sewage system design to allow innovative systems. Of particular concern are areas with wet or clay soils, highly permeable soils near wetlands, steep slopes, and in low lying coastal areas where there is insufficient depth to ground water. Conventional septic tank/leaching pool systems, particularly if they are poorly operating systems, can cause contamination to ground and surface waters in these areas. Revised County standards for single-family residence sewage disposal fields recognize that some sites are not suitable for conventional septic systems. The regulations allow use of alternative systems on a limited basis, provided a conventional system is also included, and the system is designed by a professional. These regulations should be further broadened as systems are placed in use, to allow alternative systems without requiring dual-piped standard systems.

In order to encourage the development and use of alternative sanitary waste systems in the Town of East Hampton the following guidelines are recommended:

(1) As recommended by several researchers (see Brown, 1980) and as adopted by other jurisdictions a minimum of 4 feet between septic system discharge and the groundwater table should be required. See *Harbor Protection Overlay District*, Appendix C.

(2) Utilize alternative systems for public facilities in sensitive areas where public access to the waterfront is provided.

(3) Retrofit the Town Scavenger Waste Treatment Plant for boat pumpout waste and recreational vehicle waste.

(4) When a variance to wetland setback requirements is under consideration within the *Harbor Protection Overlay District* boundary on pre-existing single and separate lots, the septic system should be inspected and where it is below current standards, it shall be brought up to current standards or replaced with an innovative or alternative system.

(5) Investigate feasibility of a pollution mitigation requirement plus an incentive system for septic system upgrades. Create a revolving fund for low interest loans to individuals who can meet a set of need-based criterial for low or fixed incomes to help install alternative or upgraded septic systems. State legislation may be needed to permit the municipality to offer property tax incentives for septic system improvements and other water quality measures on private property. Lobby for State enabling legislation if required.

This policy shall not be construed to support development or increased density on unsubdivided land in the waterfront region. Rather it is intended to correct existing contaminant sources and to limit the increase of future sources in areas of high existing density and environmental sensitivity.

POLICY 33 BEST MANAGEMENT PRACTICES WILL BE USED TO ENSURE THE CONTROL OF STORMWATER RUNOFF AND COMBINED SEWER OVERFLOWS DRAINING INTO COASTAL WATERS.

Explanation of policy:
The Inventory and Analysis of Surface Waters and Wetlands, Stormwater Abatement Program outlines areas where stormwater runoff enters into surface waters and the types of pollutants being introduced into surface waters from runoff. There are no combined discharges of sewage and stormwater runoff in the Town of East Hampton since there are no municipal sewage systems. There are however, direct discharges of stormwater runoff to surface waters. Areas which would benefit from stormwater abatement efforts are noted for each waterbody particularly in reference to coliform bacteria contamination.

Best management practices to control stormwater runoff are outlined in **Policy 37/37A**.

POLICY 34 DISCHARGE OF WASTE MATERIALS INTO COASTAL WATERS FROM VESSELS WILL BE LIMITED SO AS TO PROTECT SIGNIFICANT FISH AND WILDLIFE HABITATS, RECREATION AREAS AND WATER SUPPLY AREAS.

POLICY 34A THE FOLLOWING HARBORS AND CREEKS OF THE TOWN ARE DESIGNATED AS STATE AND FEDERAL EPA *NO-DISCHARGE ZONES* AS OF JANUARY, 1999:

Reach 1	**Northwest Creek**
Reach 2	**Three Mile Harbor, Hog Creek**
Reach 3	**Accabonac Harbor**
Reach 4	**Napeague Harbor**
Reach 6	**Lake Montauk**

Explanation of policy:
All of the Town's creeks, harbors and bay areas are susceptible to pollution from the discharge of vessel wastes. The discharge of sewage, garbage and other solid and liquid materials from water craft and marinas into State and Town waters is presently regulated by the Federal Clean Water Act, State Navigation Law and Town of East Hampton local laws. In the Town of East Hampton, enforcement of these laws will be a priority in the following areas: shellfish beds, Significant Fish and Wildlife Habitats, beaches, and other areas which need protection from contamination by vessel wastes. The following areas were designated as State and Federal EPA *No-Discharge Zones* in January, 1999:

Reach 1	Northwest Creek
Reach 2	Three Mile Harbor, Hog Creek
Reach 3	Accabonac Harbor
Reach 4	Napeague Harbor
Reach 6	Lake Montauk

A local law, **§149-60 to -67** et al of Town Code, was passed to implement the State and Federal designation. As part of the Peconic Estuary Program the Town expects the Peconic Estuary, including all the Town's northern bays, harbors and creeks, to become a designated *No-Discharge Zone*. If other Peconic Estuary communities do not enact *No-Discharge Zones* expeditiously, the Town will consider expanding its *No-Discharge Zone* to its jurisdictional boundary in the bay. However, a *No-Discharge Zone* for all bays, harbors, and creeks in the entire estuary is preferable because:

- A single regulation would apply throughout the waterbody which joins all five East End towns, simplifying compliance for users, the marine industry and enforcement by Harbormasters, Bay Constables, the US Coast Guard or other marine personnel.

- Public education can be conducted on a regional scale.

- All discharges of vessel sewerage wastes, treated or untreated, would be prohibited, simplifying enforcement, and waste would not circulate across jurisdictional boundaries.

- Federal navigation charts would indicate the *No-Discharge Zone*, giving notice to both local boaters and transient visitors cruising in the area from other regions.

The *No-Discharge Zone* applies only to marine head waste or sewerage, and does not include water discharged from properly functioning engine cooling systems or raw salt water wash down of fishing vessels. However, boaters and marina operators are encouraged to follow best management practices (BMP's), and not to discharge any wastes into Town bays and harbors including: all sanitary waste including "porta-potty" and raw sewage discharges, wastes from marine sanitation devices (MSD's), bilge discharge, dishwasher and clothes washer (gray water) discharge, trash, fuel, oil and cleaning solvent-contaminated rinse water.

To realize the benefits of *No-Discharge Zones* in Town waters will require education and the cooperation of boaters, marina operators and Town officials. The Town intends to rely on public education more than enforcement in implementing the *No-Discharge Zone*. To that end, a public education program has been established in cooperation with the Town Trustees, marina owners, civic and environmental groups to include brochures, signs, media advertising, and public service announcements. In addition, municipal pumpout facilities in the two principal harbors have been expanded, and two pumpout boat services have been instituted. Marina owners are encouraged to voluntarily designate their facility as a No-Discharge Marina in accordance with an Empire State Marine Trades Association Program, and to provide adequate and accessible shoreside sanitary facilities for marina patrons.

Other BMP's for public and private marinas and docks include providing for the collection and proper disposal of waste oil from vessels, collection of solid waste and recyclable materials, and instituting fuel spill prevention measures such as those outlined in **Policy #36** as standard operating practice.

Vessel Mooring and Anchoring

The mooring and anchoring of vessels in Trustee harbors are subject to the supervision and control of the Town Trustees. To maintain water quality and minimize shellfish area closures, the following measures have been implemented for mooring and anchorage of resident and transient boats in Town waters:

- Transient overnight anchoring is prohibited in Northwest Creek (Reach 1), Accabonac Harbor (Reach 3) and Napeague Harbor (Reach 4), except in emergency conditions of extreme weather or equipment failure.

- Mooring areas for transients have been established in both Three Mile and Montauk Harbors, with an associated mooring fee. Once moorings are full, transients are encouraged to use private marinas.

- Floating homes are prohibited within the Town. According to **§149-34** no person shall place, moor, dock, store, use, or occupy a floating home in or on Town waters.

Boater Education
The Town, the marine industry and harbor associations provide educational materials to improve boating stewardship practices, including:

- Signs at harbor entrances discouraging vessel sewerage discharge.

- Brochures distributed at marinas noting location of pumpout stations.

- Promotion of non-polluting boat products including non-toxic cleaners.

- A public awareness campaign utilizing radio, television and newspapers on the special qualities of East Hampton's clean waters. See also *Boater Education* in **Projects**.

Marine Waste Initiatives by the Town of East Hampton
Efforts by the Town of East Hampton to prevent discharge of vessel wastes into coastal waters include:

- Installation of municipal pumpout facilities in Three Mile Harbor and Lake Montauk.

- Increased Harbor Master and Bay Constable personnel.

- Installation of holding tanks at the Town Scavenger Waste Treatment plant for boat and RV waste.

- Future LWRP **Project** initiatives including *Harbor Management Plans, Boater Education and Water Quality Monitoring.*

POLICY 35 DREDGING AND DREDGE SPOIL DISPOSAL IN COASTAL WATERS WILL BE UNDERTAKEN IN A MANNER THAT MEETS EXISTING STATE DREDGING PERMIT REQUIREMENTS, AND PROTECTS SIGNIFICANT FISH AND WILDLIFE HABITATS, SCENIC RESOURCES, NATURAL PROTECTIVE FEATURES, IMPORTANT AGRICULTURAL LANDS, AND WETLANDS.

Explanation of policy:
Periodic dredging is needed to maintain navigation channels at sufficient depths for commercial fishing and recreational vessels. Dredging projects may improve circulation and flushing in enclosed harbors; however, they may also adversely affect water quality, fish and wildlife habitats, wetlands and other important coastal resources as described in the Inventory and Analysis. Often, these adverse effects can be minimized through careful design and timing of the dredging operation and proper siting of the dredge spoil disposal site. Use of clean dredge spoil for beach nourishment or habitat enhancement is encouraged. See also **Flooding and Erosion Policy #15** regarding the effects of dredging on coastal processes and erosion, and use of spoil for beach nourishment.

Publicly Owned Inlets and Channels
Inlets and channels which require periodic dredging:

Reach 1	Northwest Creek	inlet
Reach 2	Three Mile Harbor	inlet and channels
Reach 3	Accabonac Harbor	inlet and channel
Reach 4	Napeague Harbor	inlet and channel
	Fresh Pond	"gut" to Gardiner's Bay
Reach 6	Lake Montauk	inlet and channel
Reach 11	Georgica Pond	"gut" to Atlantic ocean

Publicly Owned Marinas
The following public marinas also require periodic dredging:

Reach 2	Gann Road Dock
	Town dock at Head of Harbor
Reach 6	Commercial Dock

Privately Maintained Inlets and Marinas
There are various privately maintained inlets such as Hog Creek in Reach 2 and marinas such as Devon Yacht Club in Reach 4. Locations of private dredging projects are noted in the Inventory and Analysis.

Dredging Standards and Guidelines
Dredging permits will only be granted upon demonstration that adverse impacts satisfy Federal, State and Town dredging permit standards with respect to protection of coastal resources. For a dredging permit to be issued, the following standards must be met:

(1) The navigational need must be demonstrated. Dredging to improve water circulation and flushing or habitat improvements will also be considered. See **Projects**.

(2) Dredging must not be detrimental to beaches, dunes, bluffs, tidal wetlands or water courses and must not unduly interfere with tidal flow, littoral drift, marine life, or habitats.

No new dredging (other than maintenance dredging) shall be permitted to disturb tidal wetlands either by direct removal of vegetation or by alteration of adjacent slopes such that wetlands are disturbed, covered or degraded.

In recognition of the importance of eelgrass *(Zostera marina)* to the marine habitat, no new dredging proposal shall allow destruction of eelgrass in Town waters.

(3) Dredging shall not undermine existing waterfront structures.

(4) The amount of dredging for which a permit may be issued, shall be the minimum necessary in terms of channel or basin width and depth, physical effect, and cost. Generally, dredging shall not exceed a depth of 6 feet below the mean low water elevation and the side slopes of channels may not exceed 20% (a 1 foot vertical on a 5 foot horizontal slope). Guidelines for the channels and inlets in each reach are:

Reach 1	Northwest Creek	maintenance dredge to follow natural channel (4-6 feet)
Reach 2	Three Mile Harbor	accommodate existing usage (12-14 feet)
Reach 3	Accabonac Harbor	accommodate existing usage (4-6 feet)
	Fresh Pond	improve water quality and accommodate existing usage
Reach 4	Napeague Harbor	accommodate existing usage (4-6 feet)
Reach 6	Lake Montauk	accommodate existing usage (12-14 feet at inlet at north end), maintain existing extent of channel
Reach 11	Georgica Pond	accommodate existing usage (fish migration, water level control)

(5) Dredging windows (time periods when dredging shall be conducted) shall be established on a case by case basis such that the following site specific conditions are assessed and protected: abundance of bottom flora (e.g. eelgrass), finfish and shellfish habitat; spawning and nesting activity; toxicity and physical characteristics of bottom sediments; neighboring properties; and public use of the water. Dredging will not be permitted during vulnerable periods except in emergency circumstances.

(6) Dredging will not be permitted for sand mining or for providing fill.

(7) For any new dredging permit (new dredging does not include maintenance dredging) to be issued, an explicit finding by the agencies reviewing the project must be made that similar results are impossible through project modifications or alternative actions such as relocating or modifying docks or accommodating smaller boats. The Town Trustees will determine whether to approve a dredging project based upon their own standards in effect at the time of application. Any alternatives which would avoid or reduce impacts on marine or coastal resources must be investigated.

(8) The Town and/or Town Trustees shall be consulted on and shall approve the dredge spoil site and method of disposal before any dredging permit is issued.

Dredge Spoil Disposal
Recommended dredge spoil disposal locations are described in the Inventory and Analysis and on Water Resources Maps XII-2A/-2B. The following standards for dredge spoil disposal shall apply in the Town of East Hampton:

(1) Any contaminated spoil shall be disposed of in accordance with Town and State regulations.

(2) The use of clean dredge spoil is encouraged for beach nourishment in lieu of constructing hard erosion structures; to augment Town bathing beaches and to improve bird nesting habitat. See **Flooding and Erosion Policy #15** for priorities on use of dredge spoil.

(3) Dredge spoil placed upland, other than for beach nourishment, shall be contained by straw bales, berms, dike and weir or other means to prevent material from washing back into the water or onto adjacent areas not designated for spoil disposal. In no case shall dredge spoil be placed or disposed of over drinking water supply areas.

Dredging Mitigation
Where Dredging Standards (2) and (5) protecting shellfish for new and maintenance dredging projects cannot be met, compensation to the public shellfish resource should be considered to replenish the shellfish resource. Mitigation would correspond to replacing the equivalent of the entire affected shellfish population on-site if they were harvested as adults, or of reestablishing and stocking a similar habitat in open waters.

POLICY 36 ACTIVITIES RELATED TO SHIPMENT AND STORAGE OF PETROLEUM AND OTHER HAZARDOUS MATERIALS WILL BE CONDUCTED IN A MANNER THAT WILL PREVENT OR AT LEAST MINIMIZE SPILLS INTO COASTAL WATERS; ALL PRACTICAL EFFORTS WILL BE UNDERTAKEN TO EXPEDITE THE CLEANUP OF SUCH DISCHARGES; AND RESTITUTION FOR DAMAGES WILL BE REQUIRED WHEN THESE SPILLS OCCUR.

Explanation of policy:
This policy shall apply to commercial storage and distribution facilities and to residential and other users of petroleum products, radioactive, toxic or hazardous materials. Spills, seepage or other accidents which occur on or adjacent to coastal waters or which, by virtue of natural or man-made drainage facilities, eventually reach coastal waters, are included under this policy. The use and storage of petroleum products, radioactive and other toxic or hazardous materials, and the problems related to these materials, are discussed in the inventory and analysis.

Petroleum storage and dispensing to boats, at power generating stations such as the LIPS substation on Fort Pond, or other commercial or industrial sites, potentially threaten to contaminate coastal resources. To minimize potential damage from spills, the following standards and guidelines shall be met:

(1) Methods of storage and use of petroleum products in waterfront areas shall ensure that there are no discharges to coastal waters.

(2) Marinas shall provide facilities to collect petroleum, waste oil and other boat waste products generated by marina patrons, which shall be disposed of according to State and Federal law.

(3) Existing or proposed facilities within the coastal area that dispense, ship or store petroleum products and hazardous materials from marinas or docks shall incorporate best management practices (BMP's) for spill prevention, including:

(a) A minimum of two people must be available during fueling from mechanical dispensers and trucks. The boat owner, boat captain or individual responsible for the boat shall remain on the boat during fueling. A second person, trained in the use of containment booms and fuel spills, must remain at the fueling dispenser.

(b) Valves and filters in fuel dispensers shall be opened, adjusted and removed by trained marina personnel only.

(c) A fuel spill containment boom of a length long enough to encircle the dock or marinas' longest vessel shall be maintained on-site.

(d) On-site personnel shall be trained in the use of containment booms.

(e) Any spill to coastal waters shall be cleaned up at the expense of the individual or the fueling facility responsible for such spill. To the extent permissible by law, the costs of clean-up activities undertaken by any level of government shall be reimbursed by the originator of the spill.

(4) Fuel dispensed directly from trucks to vessels shall meet the same spill prevention measures listed in a-e above.

Although this policy addresses petroleum spills on the waterfront, upland dispensing facilities can affect surface water quality. Within the *Harbor Protection Overlay District*, Appendix C, there are also requirements for fuel storage tanks of less than 1100 gallons capacity. All petroleum and hazardous spills must be reported to the NYS DEC. See **Policy #39** for procedures.

The Town has submitted an Oil Spill Contingency Plan to the New York State DEC which provides a plan in the event of an oil spill in or off coastal waters to protect significant fish and wildlife habitats as well as recreational areas. The Oil Pollution Act of 1990 provides for the regulation of commercial carriers in coastal waters. In recognition of the fragility of the coastal environment and navigational hazards existing in Block Island Sound, the Town of East Hampton shall encourage the Department of Transportation to establish a Tanker Free Zone in the Block Island Sound waters between Block Island and Montauk.

POLICY 37 BEST MANAGEMENT PRACTICES WILL BE UTILIZED TO MINIMIZE THE NON-POINT DISCHARGE OF EXCESS NUTRIENTS, ORGANICS AND ERODED SOILS INTO COASTAL WATERS.

POLICY 37A BEST MANAGEMENT PRACTICES WILL BE USED TO ABATE AND ELIMINATE STORMWATER RUNOFF DRAINING INTO COASTAL WATERS.

Explanation of policy:
Problems from non-point sources of contaminants are most acute in the Town's harbors and creeks, and manifest to a lesser extent in the open harbors and bays of the north shore. Excess nutrients, organics and other contaminants emanate from upland sources through surface runoff and groundwater underflow. Identified sources include septic systems, lawn fertilizers and chemicals, stormwater and road runoff, wildlife, swimming pool chemicals, agricultural and landscaping pesticides and nutrients, leaking fuel tanks, and wastes from marinas and boatyards.

The Town has undertaken a number of best management practices (BMP's) to prevent these contaminants from reaching surface waters, including installation of numerous catchments and recharge basins for stormwater and road runoff abatement, open space purchases for water recharge, an open marsh water management (OMWM) program to degrade pollutants in saltmarsh, and a number of other public works projects.

Best management practices for stormwater runoff include both structural and non-structural methods of preventing or mitigating pollution. In both cases the goal is to recharge stormwater to the land and minimize runoff to surface waters. The use of structural approaches such as man-made retention basins or the installation of drainage pools to control all stormwater runoff is not practical nor is it economically feasible. Where structural approaches are not feasible, non-structural approaches such as minimized clearing and soil disturbance, and the avoidance of steep slopes should be used.

In the Town of East Hampton, the following best management practices shall be required for private development and public works projects to minimize the impact of stormwater runoff. Specific measures will be applied on a case by case basis. Additional regulations apply within the *Harbor Protection Overlay District*, Appendix C, or **§153-3-75** of Town Code).

(1) There shall be no new direct discharge of stormwater into fresh or marine surface waters or into freshwater and tidal wetlands. Stormwater runoff will be controlled, as noted below, so that wetlands or surface waters are not contaminated with sediments, nutrients, bacteria, organic chemicals or heavy metals, nor shall such runoff alter the hydrology of wetlands.

(2) All stormwater shall be contained on-site to prevent the direct discharge of runoff into coastal waters both during the construction phase when soils are more susceptible to erosion and after the project is complete. The amount and velocity of runoff from a site after development shall be equal to or less than its pre-development characteristics. To achieve this objective, the following measures shall be considered during permit review:

(a) When constructing impermeable paved surfaces for site improvements on lands located near surface waters and wetlands, particular attention should be paid to siting and adequate sizing of recharge drywells such that runoff is contained on site. Recharge drywells should also be provided for gravel or "unimproved" surfaces (sometimes called semi-permeable) to collect runoff and sediments that are generated by these surfaces.

(b) For development in areas adjacent to the edge of ponds, streams, rivers, bays, and wetlands, buffer areas of a minimum of 50-feet between the development and the protected area shall be established to absorb floodwater and trap sediments. Native vegetation shall be retained in such buffer areas and where it has been cleared, the re-establishment of a vegetative buffer shall be considered during permit review. Removal of non-native invasive species such as phragmites shall be permitted as part of such revegetation projects. The clear-cutting of vegetation is prohibited in buffer areas but this shall not be construed to prohibit or prevent pedestrian access to the water.

(c) Stream channels, natural flood plains and drainage swales shall not be altered in a manner which decreases their ability to accommodate and channel stormwater runoff and flood waters, except as part of an approved stormwater abatement plan.

(d) Disturbed soils shall be stockpiled and stabilized, or revegetated with quick germination grasses, such as rye and oats as soon as possible. During the interim, erosion protection measures such as straw bales, project limiting fences, temporary vegetation, retention ponds, recharge basins, berming, silt traps and mulching shall be used to ensure that erosion and sedimentation are minimized and mitigated.

(e) Project design shall use existing topographic drainage contours for on site recharge so as to minimize regrading requirements. Use of large excavated

sumps, or recharge basins, to accomplish on site recharge is unacceptable. Recharge basins have a number of drawbacks including that they require a substantial amount of vacant and subsequently unusable land. They also form barriers to transit by people and wildlife, are unsightly, and provide havens for invasive species such as bittersweet. Maintenance requirements are an additional burden, particularly if required to be performed as part of the Town Highway budget.

(3) Existing stormwater systems that currently discharge into surface waters shall be evaluated to determine whether these systems can be upgraded to minimize impacts to surface waters, wetlands and adjacent areas. Road repair and maintenance by the Town shall provide adequate maintenance of leaching pools, increased street cleaning, and reduced use of road salt.

(4) To control waste runoff from livestock, a buffer of at least 100 feet shall be established between the upland edge of wetlands and areas used for quartering of animals. Where slopes exceed 10% in these buffer areas, the buffer should be increased or runoff should be contained using berms or other retention measures. Manure piles should be setback 200 feet from property lines, wetlands and surface waters.

(5) Vector control ditches will not be used as drainage ditches for road runoff.

(6) Use of pesticides, herbicides, fertilizers or road salts shall be minimized within 200 ft. of a fresh water or tidal wetland and organic alternatives employed where such treatment is necessary.

Residential and other private sources of non-point pollutants are being reduced through a *Harbor Protection Overlay District* (HPOD) codified in the Zoning Code in **§153-3-71 through -75**. The HPOD local law essentially covers upland properties one lot deep surrounding the Town's enclosed harbors, and provides regulations for control of stormwater runoff, septic systems, clearing of vegetation, swimming pools, use of treated wood products, fuel storage tanks, and fertilizers, pesticides and herbicides. If HPOD proves effective, the boundary should be reevaluated to include a more comprehensive watershed as well as areas affecting other surface waterbodies including the open bays. The current boundaries of the HPOD are shown on Water Resources Maps XII-2A/-2B, and the text of the *HPOD* law is included in Appendix C. *HPOD* regulations are excerpted as follows:

§ 153-3-75. Regulations.

In addition to any other provisions of this chapter which may apply to them, lots, lands, buildings, structures, uses, and activities within the Harbor Protection Overlay District shall be subject to the following restrictions and regulations:

A. Control of stormwater runoff. The following regulations shall apply to structures or activities which produce or contribute to stormwater pollution of the Town's surface waters:

(1) No parking lot or private driveway shall hereafter be constructed unless it has either an unimproved surface (e.g., dirt, crushed shells) or an improved surface consisting of one or more of the following materials: poured concrete, hot plant mix asphalt, rapid-curing cut-back asphalt, or quartz gravel.

(2) No road, private driveway, or parking lot with an improved surface shall hereafter be constructed unless all stormwater generated by the said structure is directed into one or more catchment basins. The said catchment basin or basins shall have a combined volume (in cubic feet) equal to the surface area of the road, driveway, and/or parking area (in square feet), divided by six (6).

(3) Any road, private driveway, or parking lot which is hereafter constructed with an improved surface shall be maintained so that all stormwater generated by the said structure is actually directed into the catchment basin or basins required by the preceding paragraph. Any catchment basin required by the preceding paragraph shall be kept clean and maintained so that it recharges stormwater into the ground without overflowing.

(4) No pipe, culvert, drain, or similar conduit may hereafter be constructed or installed which discharges stormwater into wetlands (including surface waters).

(5) Every principal building or addition to a principal building which is hereafter constructed or erected shall be furnished with gutters and leaders to direct stormwater from roofs into one or more catchment basins. The said catchment basin or basins shall have a combined volume (in cubic feet) equal to the surface area of the roof (in square feet), divided by six (6).

(6) During construction work the disturbance of natural vegetation and land contours shall be minimized to the maximum extent practicable. Project-limiting fencing, siltation mesh, straw bales, or similar devices for limiting land disturbance and retarding erosion and siltation shall be used during construction work and during any land clearing or grading in preparation for or associated with construction work.

B. New sanitary septic systems. The following regulations shall govern the installation of all septic systems after this date, except for septic systems which are installed to replace legally preexisting septic systems:

(1) No such septic system shall be installed or constructed unless it is set back a minimum of two hundred (200) feet from the surface waters of Accabonac Creek, Fort Pond (including the arm of Fort Pond north of Industrial Road), Georgica Pond, Great Pond (Lake Montauk), Hog Creek, Napeague Harbor, Northwest Creek, Northwest Harbor, Stepping Stones Pond, Three Mile Harbor, Tuthill Pond, and/or Wainscott Pond and from the upland boundary of any wetlands contiguous to the foregoing bodies of water. To the extent that any provision of Article IV imposes a lesser wetland setback for septic systems, the requirements of this paragraph shall be controlling with respect to lands within the Harbor Protection Overlay District.

(2) No septic system leaching pool shall hereafter be installed unless the bottom of the leaching pool is situated a minimum of four (4) feet above the groundwater table.

C. Existing sanitary septic systems. Any septic system which legally exists on a residential property on January 1, 1996 shall be replaced or upgraded in the following circumstances and to the following extent:

(1) Every septic system regulated by this subsection shall be replaced or upgraded if:

(a) A natural resources special permit is required for work to be performed on the lot or parcel containing the septic system; and

(b) The work to be performed will increase the habitable floor area of a principal building on the lot, or will increase the number of bathrooms within a building on the lot; and

(c) The septic system in question does not meet the minimum requirements of the SCDHS for vertical separation to groundwater, for setback to surface waters, or for septic system capacity, or lacks a septic tank.

(2) Where this subsection requires that an existing septic system be replaced or upgraded, the new or upgraded septic system shall meet the following requirements:

(a) It shall comply with the requirements of SCDHS for new septic systems and shall be installed under the supervision of the Sanitation Inspector; and

(b) It shall be set back a minimum of one hundred fifty (150) feet from the upland boundary of all tidal wetlands (including tidal surface

waters) or, if that is not feasible, it shall be set back the maximum practicable distance from the surface waters of Accabonac Creek, Fort Pond (including the arm of Fort Pond north of Industrial Road), Georgica Pond, Great Pond (Lake Montauk), Hog Creek, Napeague Harbor, Northwest Creek, Northwest Harbor, Stepping Stones Pond, Three Mile Harbor, Tuthill Pond, and/or Wainscott Pond and from the upland boundary of any wetlands contiguous to the foregoing bodies of water, taking into consideration such factors as the physical constraints of the site and the location of nearby water supply wells.

D. Limited clearing of lots. Clearing of lots or parcels of land within the Harbor Protection Overlay District shall be restricted as set forth herein.

(1) The total area of a lot which may be cleared of indigenous natural vegetation shall not exceed the following amounts for any lot located wholly or partly within the overlay district:

Lot Area (square feet)	**Maximum Clearing Permitted**
<u>In Residence Districts:</u>	
Up to and including 39,999	10,000 square feet or 35% of lot area, whichever is greater
From 40,000 to and including 280,000	10,000 square feet + (lot area X 12.5%)
Greater than 280,000	45,000 square feet
<u>In Commercial Districts</u>:	
All lots	10,000 square feet or 50% of lot area, whichever is greater

In calculating the amount of clearing permitted on a flag lot by this subsection, the area of any flag strip shall be excluded from lot area. Likewise, any clearing for driveway purposes within the flag strip shall not be counted into the permissible amount of clearing.

(2) Clearing in excess of forty-five thousand (45,000) square feet on any lot in a residence district is prohibited unless the following requirements are met:

(a) The area of the lot, excluding the area of any flag strip but otherwise determined as set forth in § 153-1-20 hereof, exceeds three hundred thousand (300,000) square feet; and

(b) Site plan approval and a special permit have been first obtained from the Planning Board.

E. Swimming pools. The following regulations shall govern the construction or installation of swimming pools:

(1) No swimming pool shall hereafter be constructed or installed unless it is furnished with a system to reduce the use of chlorine disinfectant, such as an ozonator, ionizer, or ultra violet disinfectant system.

(2) No swimming pool shall hereafter be constructed or installed unless the bottom of the swimming pool is situated a minimum of two (2) feet above the groundwater table. The Building Inspector shall require proof of compliance with this provision before issuing a Certificate of Occupancy.

(3) No swimming pool shall hereafter be constructed or installed unless it is provided with one or more dry wells which are easily accessible for the evacuation of water from the swimming pool. In the case of a gunite or other evacuable swimming pool, such dry wells shall have a total volume at least equal to ten percent (10%) of the volume of the pool, and in any case not less than four hundred fifty (450) gallons (or approximately the volume of a three (3) foot deep by five (5) foot wide dry well). In the case of a vinyl-lined swimming pool, the total volume of dry wells shall be at least equal to one-half (1/2) the dry well volume required for a gunite pool of the same size.

(4) No swimming pool shall be drained or have its water discharged into a driveway, storm drain, public or private street, or into wetlands (including surface waters), nor shall any swimming pool be drained or have its water discharged into any receptacle other than a dry well installed as required by this subsection.

(5) The cleaning of swimming pools or swimming pool surfaces by means of an acid wash is prohibited unless the acids used are completely neutralized before discharge from the swimming pool.

F. Fuel storage tanks. On lots having one (1) or more fuel storage tanks, whose combined capacity does not exceed one thousand one hundred (1,100) gallons, the

installation of each fuel storage tank shall hereafter be subject to the following requirements and restrictions:

(1) If installed belowground, each tank shall be of double-walled fiberglass manufacture.

(2) If installed aboveground, each tank shall either:

(a) be installed within the cellar of a building having a poured-concrete floor, or

(b) be installed atop an impermeable flat surface, e.g., a concrete pad, which extends at least six (6) inches laterally beyond the outermost sides of the tank and any associated piping, and be installed so that it is open and accessible for inspection on at least three (3) sides.

In addition to HPOD the following BMP's are recommended to eliminate or reduce non-point discharges from agriculture and development:

Agricultural Cultivation Practices/Best Management Practices to Minimize Non-point Discharges

(1) Plow in the direction, usually parallel to the shoreline, that maximizes water retention.

(2) Where land is under cultivation directly adjacent to the wetland boundary, soil will be retained by a 50-foot buffer zone of indigenous vegetation (where possible), or by straw bales or silt cloth.

(3) Encourage the planting of crops with deep root systems in the upland area of wetlands (200-300 feet).

(4) Minimize the use of fertilizers, herbicides and pesticides.

(5) Implement controls noted in **Policy #33** for quartering of livestock.

Development Controls/Best Management Practices to Minimize Non-point Discharges.

(1) Limit impervious surfaces (see **Policy #33**).

(2) Minimize stormwater runoff (see **Policy #33**).

(3) Minimize vessel discharges and provide treatment services (see **Policy #34**).

(4) Minimize marina waste discharges from fueling facilities, boat maintenance and repair, and fish waste (see **Policies #34 and #36**).

(5) Upgrade faulty septic systems and encourage use of alternative sanitary systems (see **Policies #32 and #38**).

(6) Ensure proper techniques for road construction, maintenance and repair (see **Policy #33**).

(7) Discourage use of chemically treated wood in watershed tributary areas.

(8) Maintain and reestablish indigenous plant species within buffer areas.

POLICY 38 **THE QUALITY AND QUANTITY OF SURFACE WATER AND GROUNDWATER SUPPLIES, WILL BE CONSERVED AND PROTECTED, PARTICULARLY WHERE SUCH WATERS CONSTITUTE THE PRIMARY OR SOLE SOURCE OF WATER SUPPLY.**

POLICY 38A **MAINTAIN WATER RESOURCES AS NEAR TO THEIR NATURAL CONDITION OF PURITY AS REASONABLY POSSIBLE TO SAFEGUARD PUBLIC HEALTH.**

Explanation of policy:
Groundwater is the principle source of drinking water in the Town and therefore must be protected. Since Long Island's groundwater supply has been designated a "sole source aquifer", all actions must be reviewed relative to their impacts on the Long Island aquifer. Recharge areas and groundwater drinking supplies in the Town of East Hampton are discussed in the Inventory and Analysis of Groundwater and are shown on Water Resources Maps XII-2A/-2B.

The designated best use of all groundwater of Suffolk County is for public and private water supply. The entire waterfront study area is located in Hydrogeologic Zone IV, which is a water supply sensitive area established by Suffolk County. As a result of geological conditions in this zone, groundwater in most of the Town's waterfront area is vulnerable to salt water intrusion. Given the vulnerability of the Town's ground water supplies and its value as a sole source of drinking water, all available practical methods of preventing and controlling water pollution shall be utilized.

There are three potential point sources of pollution to groundwater in the Town: contaminants from the Montauk landfill (Reach 5) and the discharges from tertiary sewage treatment plants, one located in Reach 5, the other in Reach 6. All other potential pollution sources are considered "non-point" and include septic systems, recharge or catch basins receiving stormwater runoff and swimming pool discharge, agricultural chemicals, lawn and landscaping chemicals, leaking underground storage tanks, and incidental spills. The Inventory and Analysis summarizes the status of underground tank

removal and replacement, and spill clean-up. All other sources are associated with residential and commercial development as depicted on the land use map of the Town.

In addition to the other standards of the Water Resources Policies relative to ground water resources and the goals and objectives of the Water Resources Management Report (TOEH 1987), the following guidelines should apply throughout the Town's waterfront area:

(1) Test hole or test well data that is provided to determine depth to groundwater should be accompanied by the time and date so that it can be checked against tidal conditions. This is a requirement within the *Harbor Protection Overlay District* (HPOD).

(2) A minimum of four feet should be required between the bottom of any septic system discharge point and the groundwater table, except if this cannot be met in the waterfront zone. This is a requirement within HPOD.

(3) All construction should be equipped with water conserving fixtures, per State law.

(4) To the maximum extent practicable, native species requiring the minimum application of fertilizers, biocides and water shall be utilized for lawns and landscaping. This is a requirement within HPOD.

(5) When improved lots are redeveloped, existing septic systems should be upgraded to current standards and, where necessary, relocated such that setbacks from sensitive features are maximized. This is a requirement within HPOD.

(6) Where only minimum standards for septic systems can be met or cannot be met, alternative or innovative sanitary facility design should be considered. This is required within HPOD.

(7) Application of the Water Recharge Overlay District clearing restrictions and limitations on allowable fertilized turf in the Town's waterfront area. This is required within HPOD.

(8) Discourage the siting of commercial or industrial facilities with the potential for ground or surface water pollution. This is implemented generally through Town Zoning and Site Plan Review requirements.

POLICY 39 THE TRANSPORT, STORAGE, TREATMENT AND DISPOSAL OF SOLID WASTES, PARTICULARLY HAZARDOUS WASTES, WITHIN COASTAL AREAS WILL BE CONDUCTED IN SUCH A MANNER SO AS TO PROTECT GROUNDWATER AND SURFACE WATER SUPPLIES, SIGNIFICANT FISH AND WILDLIFE

HABITATS, RECREATION AREAS, IMPORTANT AGRICULTURAL LANDS AND SCENIC RESOURCES.

Explanation of policy:
The definition of terms "solid wastes" and "solid wastes management facilities" are taken from New York's Solid Waste Management Act (Environmental Conservation Law, Article 27). Solid waste means all putrescible and non-putrescible materials or substances that are discarded or rejected as being spent, useless, worthless or in excess to the owners at the time of such discard or rejection, including but not limited to garbage, refuse, industrial and commercial waste, sludge from air or water treatment facilities, rubbish, tires, ashes, contained gaseous material, incinerator residue, construction and demolition debris, discarded automobiles, and offal.

Hazardous wastes are unwanted by-products of manufacturing processes generally characterized as being flammable, corrosive, reactive, or toxic. More specifically, hazardous waste is defined in Environmental Conservation Law (Section 27-0901 (3)) as "waste or combination of wastes which because of its quantity, concentration, or physical, chemical or infectious characteristics may: 1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or 2) pose a substantial present or potential hazard to human health or the environment which if improperly treated, stored, transported, disposed or otherwise managed." A list of hazardous wastes has been adopted by NYS DEC (6NYCRR Part 371).

Examples of solid waste management facilities include resource recovery facilities, land fills, and solid waste reduction facilities. A major problem associated with the disposal and treatment of solid wastes is the contamination of ground and surface water resources.

Sites for the storage, treatment or disposal of solid waste in the Town of East Hampton are identified in the Town's Solid Waste Management Plan and GEIS (E and A Environmental Consultants, 1990). Two are located in Reach 5: the inactive Montauk landfill and the active Montauk transfer facility.

In order to facilitate best management practices to protect our ground and surface waters, the Town of East Hampton employs the following practices:

(1) Has halted land filling of solid waste and undertaken a program to promote complete recycling according to the Town's Solid Waste Management Plan (SWMP).

(2) Actively seeks markets for all its recycled refuse.

(3) Prohibits incinerators.

(4) Prohibits disposal or treatment of solid waste within the watershed of coastal waters.

(5) Disposes of contaminated soils in accordance with State and Federal regulations.

(6) Collects and disposes of "red bag" medical waste in accordance with State and Federal regulations.

(7) Prohibits the siting of new facilities with the potential for generating hazardous wastes (PCB's, petroleum by-products, pesticides and other chemical contaminants) within the coastal zone and encourages upgrading or relocating existing hazardous waste generating facilities.

Designated areas in the Town of East Hampton for the handling or transport of hazardous wastes are regulated by the NYS DEC. Under New York State 364 regulations, the handling or transport of hazardous or large amounts of solid wastes is prohibited by an individual without a license or permit.

Commercial users of hazardous materials should be encouraged to store such materials outside of the coastal zone. The Town should survey and monitor such activities involving hazardous waste storage to prevent surface or groundwater contamination in the event of a spill or a catastrophic storm.

Often, temporary or small quantity generators of hazardous waste such as photo processors, garages, landscapers farmers and homeowners are not regulated or scrutinized to the same degree as permanent larger facilities. A temporary storage facility, similar to those provided through the New York State Stop Throwing Out Pollutants (STOP) Program, is needed in the Town so small generators can dispose of their wastes.

The Town of East Hampton has acquired a permit to construct a S.T.O.P. facility. Until such time as funding permits its construction, the Town will be responsible for conducting two S.T.O.P. collection days per year on consecutive days at two collection stations, the Montauk Recycling Transfer Station in Reach 5 and the Town Recycling Center on Springs-Fireplace Road upland of Reach 3. All measures will be made to reclaim, reuse and recycle the substances collected. Examples of these substances include paint, photochemicals and oil pesticides, fertilizers and herbicides.

POLICY 40 EFFLUENT DISCHARGED FROM MAJOR STEAM ELECTRIC GENERATING AND INDUSTRIAL FACILITIES INTO COASTAL WATERS WILL NOT BE UNDULY INJURIOUS TO FISH AND WILDLIFE AND SHALL CONFORM TO STATE WATER QUALITY STANDARDS.

Explanation of why policy is not applicable:
This policy does not apply because there are no steam electric generating or industrial facilities existing in or planned for siting in the Town of East Hampton coastal area. Nevertheless, **Policy #27** concerning siting and construction of energy facilities contains recommendations for siting of non-renewable energy facilities and the encouragement of renewable energy facilities.

Should a major steam electric generating or other major industrial facility be proposed in the future, a Special Permit should be required designating standards for storage, and delivery of toxic chemicals, including fuel, oil, waste oil and transformer oil as well as discharges for waste heat, waste water, solid waste, particulates and noise.

POLICY 44 PRESERVE AND PROTECT TIDAL AND FRESHWATER WETLANDS AND PRESERVE THE BENEFITS DERIVED FROM THESE AREAS.

Explanation of policy:
The benefits derived from the preservation of tidal and freshwater wetlands include but are not limited to:

(1) Providing habitat for wildlife and fish, including rare and endangered species and a substantial portion of the State's commercial finfish and shellfish resources;

(2) Providing the foundation of and vital contributions to aquatic and terrestrial food chains;

(3) Controlling erosion and storm flooding through absorption of flood waters and dampening of wave action;

(4) Limiting pollution through absorption and filtering of contaminants;

(5) Groundwater protection;

(6) Recreational opportunities;

(7) Educational and scientific opportunities; and

(8) Esthetically pleasing open space in otherwise densely developed areas.

Tidal Wetlands
Tidal wetlands in the Town of East Hampton are extensive in Reaches 1, 2, 3, 4, 6, 7, and 12 in the protected harbors and streams tributary to Gardiners Bay, Napeague Bay and Block Island Sound. Steep topography in Reach 5 and exposed dunelands in Reaches 8, 9, 10, and 11 provide less hospitable conditions for saltmarsh formation, although these areas may nonetheless remain within the regulatory definition of tidal wetlands. Descriptions of these wetlands are provided in the Inventory and Analysis of these policies and **Significant Habitats Policy #7** and principal locations are illustrated on Freshwater and Tidal Wetlands Map XII-1.

In the Town of East Hampton tidal wetlands are defined as follows:

> All lands lying in the area inundated by tidal action and/or peak lunar tides exhibiting salt marsh peat and saline or brackish soils at their undisturbed surface; all estuaries, salt meadows, tidal flats and littoral zones; and all lands upon which grow one or more of the following plant species or associations: salt marsh hay *(Spartina patens)*, spike-grass *(Distichlis spicata)*, black grass *(Juncus gerardi)*, salt water cordgrass *(Spartina alterniflora)*, saltwort, glasswort *(Salicornia species)*, sea lavender *(Limonium carolinianum)*, salt marsh bulrush or chairmaker's rush *(Scirpus species)*, sand spurry *(Spergularia marina)*, groundsel bush *(Baccharis halimifolia)*, high tide bush or marsh elder *(Iva frutescens)*, cattail *(Typha species)*, spikerush *(Eleocharis species)*, bent grass *(Agrostis species)*, rockweed *(Fucus species)*, common reed *(Phragmites communis)*, marsh pink *(Sabatia species)*, sea blite *(Suaeda species)*, umbrella sedges *(Fimbristylis species)*, marshmallow *(Hibiscus palustris)*, and *Triglochin* species. Lands lying within or beneath tidal waters shall also be deemed to be "tidal wetlands" regardless of the type or amount of vegetation growing thereon or the absence of same.

Vector control ditches are considered wetlands and wetland setbacks are applicable.

Fresh Water Wetlands

Freshwater wetlands in the Town of East Hampton are widely distributed in Reaches 4, 5, 6, 7, 8, 9 and 10 on the Montauk peninsula and Napeague Beach due to the high clay content of the soils and low lying topography. However freshwater wetlands are also well represented in the remaining Reaches. Their distribution and the causes of their formation are described in detail in the Inventory and Analysis of surface waters and wetlands, and on Map XII-1.

In the Town Code of East Hampton in **§153-1-20**, freshwater wetlands are defined as:

> All lands lying within the boundaries of any watercourse; all fresh marshes, swamps, bogs, kettlehole bogs and the like, regardless of the particular types or amounts of vegetation growing thereon or therein or the absence of same; and all lands upon which grow one or more of the following plant species or associations: red maple *(Acer rubrum)*, tupelo *(Nyssa sylvatica)*, black willow *(Salix nigra)*, shining willow *(Salix lucida)*, Atlantic white cedar *(Chamaecyparis thyoides)*, swamp cottonwood *(Populus heterophylla)*, swamp azalea *(Rhododendron viscosum)*, sweet pepperbush *(Clethra alnifolia)*, winterberry holly *(Ilex verticillata)*, leatherleaf *(Chamaedaphne calyculata)*, swamp sweetbells *(Leucothoe racemosa)*, sheep laurel *(Kalmia angustifolia)*, cranberry *(Vaccinium macrocarpon)*, skunk cabbage *(Symplocarpus foetidus)*, jack-in-the-pulpit *(Arisaema triphyllum)*, cinnamon fern *(Osmunda cinnamomea)*, royal fern *(Osmunda regalis)*, marsh fern *(Thelpteris palustris)*, chain ferns *(Woodwardia virginica)*, sensitive fern *(Onoclea sensibilis)*, wetland sedges *(Carex species)*, wetland bullrushes *(Scirpus species)*, wetland spikerushes *(Eleocharis species)*, wetland soft rushes *(Juncus species)*, wetland beak rushes *(Rhynchospora species)*, wetland grasses *(e.g. Phragmites communis)*, wetland and aquatic herbs, cattails *(Typha angustifolia)*, and sphagnum moss. Freshwater wetlands are also deemed to include all

freshwater wetlands designated on the Freshwater Wetlands Map for Suffolk County promulgated by NYS DEC, effective May 26, 1993, and as may subsequently be amended.

Standards for Development Near Tidal and Freshwater Wetlands
Developments near wetlands are regulated by **§153-4** of the Town Code. The following standards shall be used to protect and preserve wetlands:

(1) All structures and uses, other than erosion protection structures shall be located on upland sites and in a location so that no wetland will be diminished in size, polluted, degraded or lost, or placed in peril in order to establish the structure or use (see minimum setback standards enumerated in item 4 below). If there is inadequate upland for the structure or use proposed, minimal exceptions to these requirements may be authorized, but only after:

(a) Public acquisition has been considered, and definitively rejected.

(b) Reasonable alternatives to construction of a primary structure are deemed to be an unreasonable use of the property.

(c) Alternative designs that consider smaller buildings, residences or structures, reduced yard or other setbacks, or smaller or reconfigured areas of use are not feasible, lawful, or effective in preventing wetlands filling or wetlands damage.

(2) Erosion protection structures may only be constructed if all criteria in **Policies #11-17** are met, and if the structure and the associated uses are not detrimental to tidal waters, wetlands or watercourses. No structure shall be permitted which would unduly interfere with tidal flow, with marine life or habitat, or which would destroy other than minimally practicable areas of existing wetland vegetation or beach grass.

(3) A structure will be deemed in violation of the preceding standards and ineligible for a permit if it, and all other structures likely to be sited in conjunction with it, would together cause undue interference with tidal flow, or destruction of marine life, habitat, or wetland vegetation or beachgrass.

(4) The following minimum setbacks from the upland boundary of all wetlands (including underwater lands) shall be adhered to on all lots:

(a) All wastewater disposal system structures including drywells collecting effluent and overflow from swimming pools, 150 feet.

(b) All other structures, 100 feet.

(c) Turf, landscaping or other clearing of natural vegetation: 50 feet for highest and best standard. See item 6 below for relief provision.

(5) For lots on which the minimum setbacks called for in the preceding standard can be met or exceeded, the setback of a structure, particularly if it discharges effluent to the subsurface, should be increased to the maximum extent practicable provided that it is sited in accordance with all other standards.

(6) For existing single and separate lots on which the minimum setbacks called for in the preceding standard cannot be met, even through reasonable reductions in yard setbacks or reductions in the size of the proposed structures, the setback of a structure may be less than otherwise required provided that the actual setback is as great as possible and the proposed structure is sited in accordance with all other standards.

(7) Whenever possible a common driveway shall be used to serve development so that clearing is minimized.

(8) In no cases shall wetlands be filled. Where no dry access to a property exists the owner shall first seek to obtain alternate access from an adjoining property owner and secondarily pursue a means to traverse the wetlands in accordance with all State and local regulations.