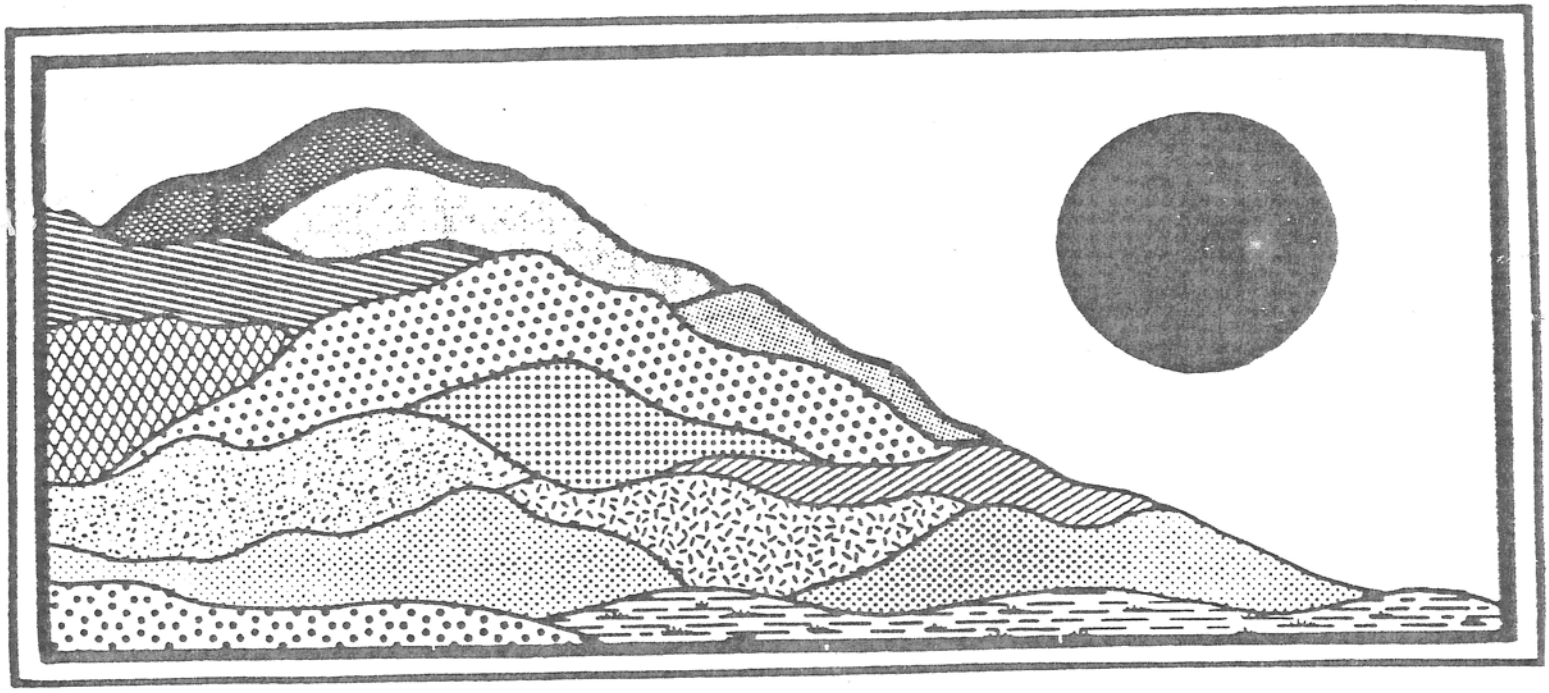
Rechannelization of Noname Brook

Waterford, Connecticut

November 1985



ENVIRONMENTAL REVIEW TEAM REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Rechannelization of Noname Brook

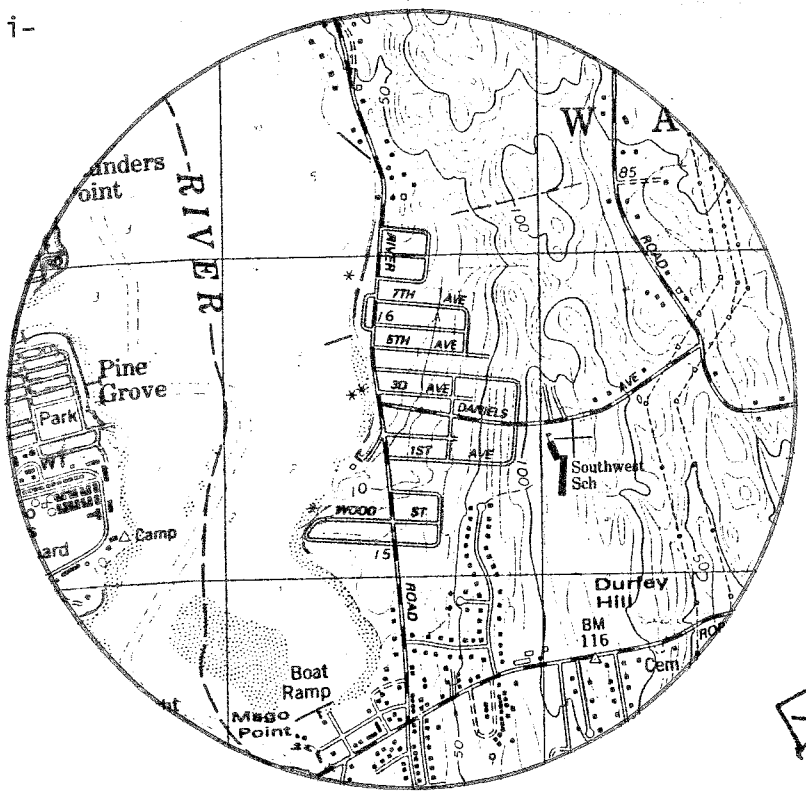
Waterford, Connecticut

Review Date: AUGUST 15, 1985

Report Date: NOVEMBER, 1985

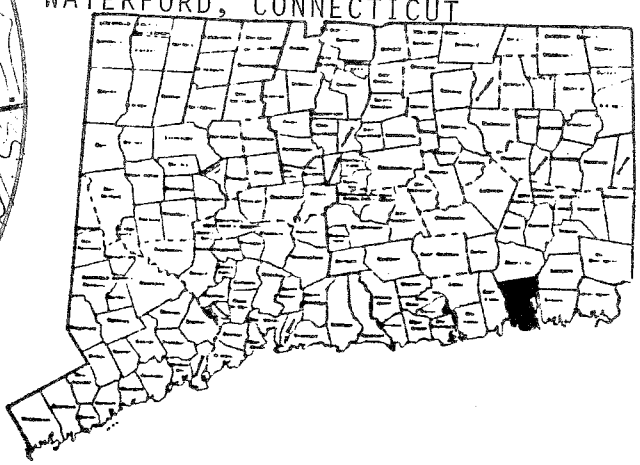
RC&D

ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN CONNECTICUT 06234



Site Location

RECHANNELIZATION
OF
NONAME BROOK
WATERFORD, CONNECTICUT



EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

TABLE OF CONTENTS

TABLE OF MAPS

ENVIRONMENTAL REVIEW TEAM REPORT
ON
THE RECHANNELIZATION OF NONAME BROOK
WATERFORD, CONNECTICUT

This report is an outgrowth of a request from the Waterford Conservation Commission to the New London Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Thursday, August 15, 1985. Team members participating on this review included:

Mark Alexander	-	Marine Biologist-DEP, Marine Fisheries Program
Don Capellaro	-	Sanitarian-CT Department of Health
Richard Carpino	-	Principal Environmental Sanitarian-Mosquito and Vector Control Section, CT Department of Health
Linda Gunn	-	Marine Biologist-DEP, Marine Fisheries Program
Jackie Lappen	-	Biologist-DEP, Coastal Area Management
Maria Martinez	-	Soil Conservationist-USDA, Soil Conservation Service
Ron Rozsa	-	Biologist-DEP, Coastal Area Management
Dwight Southwick	-	Engineering Specialist-USDA, Soil Conservation Service
Elaine Sych	-	Coordinator-Eastern CT Environmental Review Team
Bill Warzecha	-	Geologist-DEP, Natural Resources Center

Prior to the review day, each team member received a summary of the proposed project, a list of the Commission's concerns, a soils map, a location map, and a description of the Public Works proposal. The Team met with, and were accompanied by members of the Conservation Commission, Public Works Department, the Waterford/East Lyme Shellfish Commission and a representative of the engineering firm. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

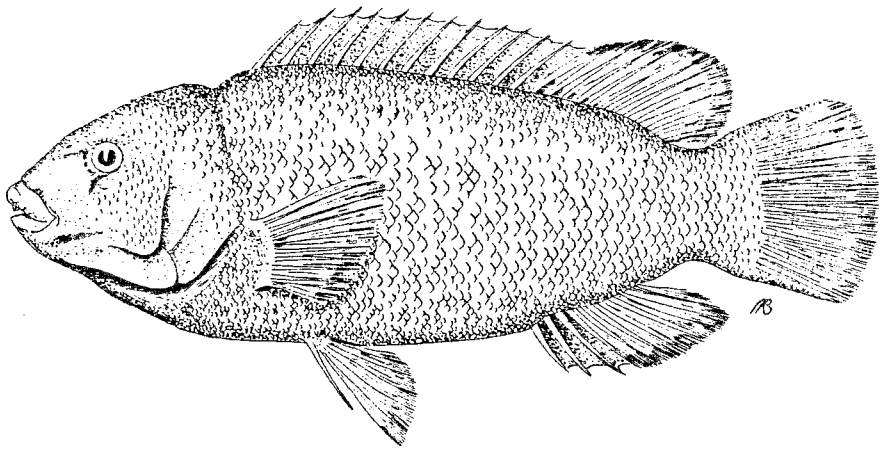
This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this subdivision.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P.O. Box 198
Brooklyn, CT 06234
(203) 774-1253

INTRODUCTION



The Waterford Conservation Commission has asked for Environmental Review Team assistance in reviewing the Public Works Department's plans to rechannelize an unnamed brook (Noname Brook) along Niantic River Road. This work will be done in conjunction with the town's Roadway Construction Program which involves reconstructing existing roadways and upgrading stormwater drainage facilities. Activities being proposed to improve the brook's flow characteristics and control sedimentation include: replacing existing cross culverts; reshaping the channel bottom; construction of a modified riprap channel; and placement of riprap at inlets, outlets and along the trapezoidal shaped channel. One segment of the brook will require filling.

The subject project area is primarily located on the east side of Niantic River Road between 7th and 1st Avenues. The watercourse subsequently crosses Niantic River Road, discharging into a tidal wetland area connected to the Niantic River. The noname stream originates from a pond located just above 7th Avenue. There is approximately 100 acres of underdeveloped pond watershed area. The avenues that would be involved are, however, extensively developed on relatively small lots. Most of the development apparently began [early 1900] as seasonal dwellings with most of the properties now occupied on a year-round basis. In conjunction with stream rechannelization, the town is in different phases of installing public sewers, upgrading storm sewers and reconstructuring roadways. It is the intent to more or less have these major improvement projects undertaken during the same time frame in order to expedite services and/or benefits with a shorter period of disruption and inconvenience and hopefully, lower overall costs.

It has been recognized that malfunctioning on site waste disposal systems in the area have contributed sewage effluent either directly or indirectly by surface water runoff to the stream. In turn, the water quality in the tidal marsh and the Niantic River for some distances from the point of stream outlet, has been affected to some degree. As a result of evaluating the sanitary quality of the water along with sanitary surveys of the land areas for possible sources of pollution, the area has been found to be unacceptable for the taking of shellfish and as a precautionary health measure, a portion of the river has been closed for this purpose.

It is apparent the normal flow of the noname stream is restricted and impeded due to a number of factors such as: Alignment of stream course; size(s) of roadway cross-culverts, disposition of organic matter. Thus, by reducing the stream capacity, various physical nuisances from unsightliness to offensive odors of putrification can arise. Also, there can be localized flooding and possibly mosquito breeding in stagnant pockets during certain periods of the year. A better volume of stream water should also enhance its oxygen and dilution capacity which should improve its self-purification ability. Limited channel improvements along its lower discharge area (from Niantic River Road to the Niantic River), should allow for better tidal flushing and oxygen balance. As observed, the brook outlet area contained deposits of black organic matter.

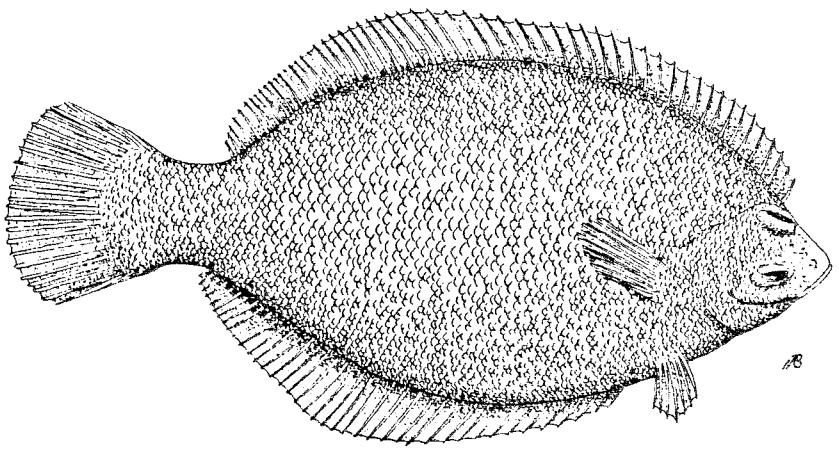
For various reasons, the program for stream rechannelization (along with public sewers), should achieve the objectives of desired improvements. The benefits to residents of the area and to all others using the recreational facilities of the Niantic River, would seem to justify the means.

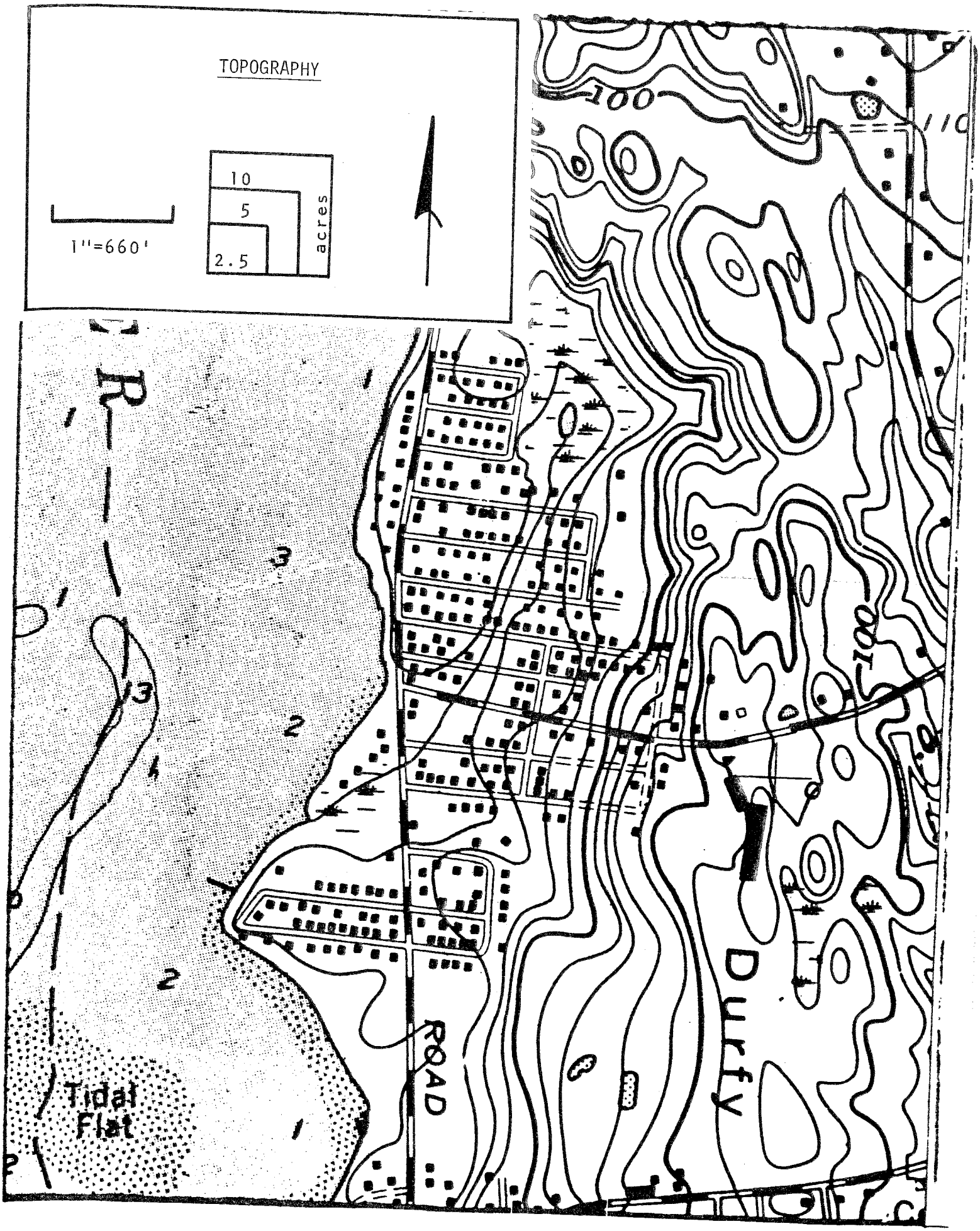
Certainly, in its implementation, every effort should be made to prevent or minimize erosion and sedimentation problems and otherwise lessen the impact on the environment, whether it be wetlands or wildlife.

Specifically, the Conservation Commission is concerned with the possible impacts this project will have on: degradation of tidal wetlands; the effects of altering stream volumes and velocities at this location in the watershed; and construction related impacts on the coastal habitat. The Commission is also interested in the possibility of restoring shellfish in this area.

For the purposes of this report the information has been divided into two parts. Part One deals with information, concerns and recommendations dealing with the topography, geology, hydrology, soils, engineering, mosquito control and fisheries. A brief summary follows which highlights major findings, concerns and recommendations for each topic area. Part Two contains the information from the Department of Environmental Protection's Coastal Area Management Unit covering such topics as wetland descriptions, jurisdiction, permits, coastal policies and recommendations.

PART ONE




TOPOGRAPHY
1"=660'
10
5
2.5
acres
100
110
R
R'
3
2
1
3
2
1
2
1
Tidal Flat
ROAD
Durfy
Rd.

TOPOGRAPHY AND SETTING

Noname Brook is a relatively small streamcourse located in the western part of Waterford. The first ±1,000 (approximately) feet of the streamcourse is tidal and, therefore, receives saltwater input. The stream is intermittent north of the area influenced by tidal action. Noname Brook originates as the outlet stream for a small pond east of Circle Street. It flows generally in a southerly direction from the pond for a distance of about 2,500 feet ultimately emptying into the Niantic River.

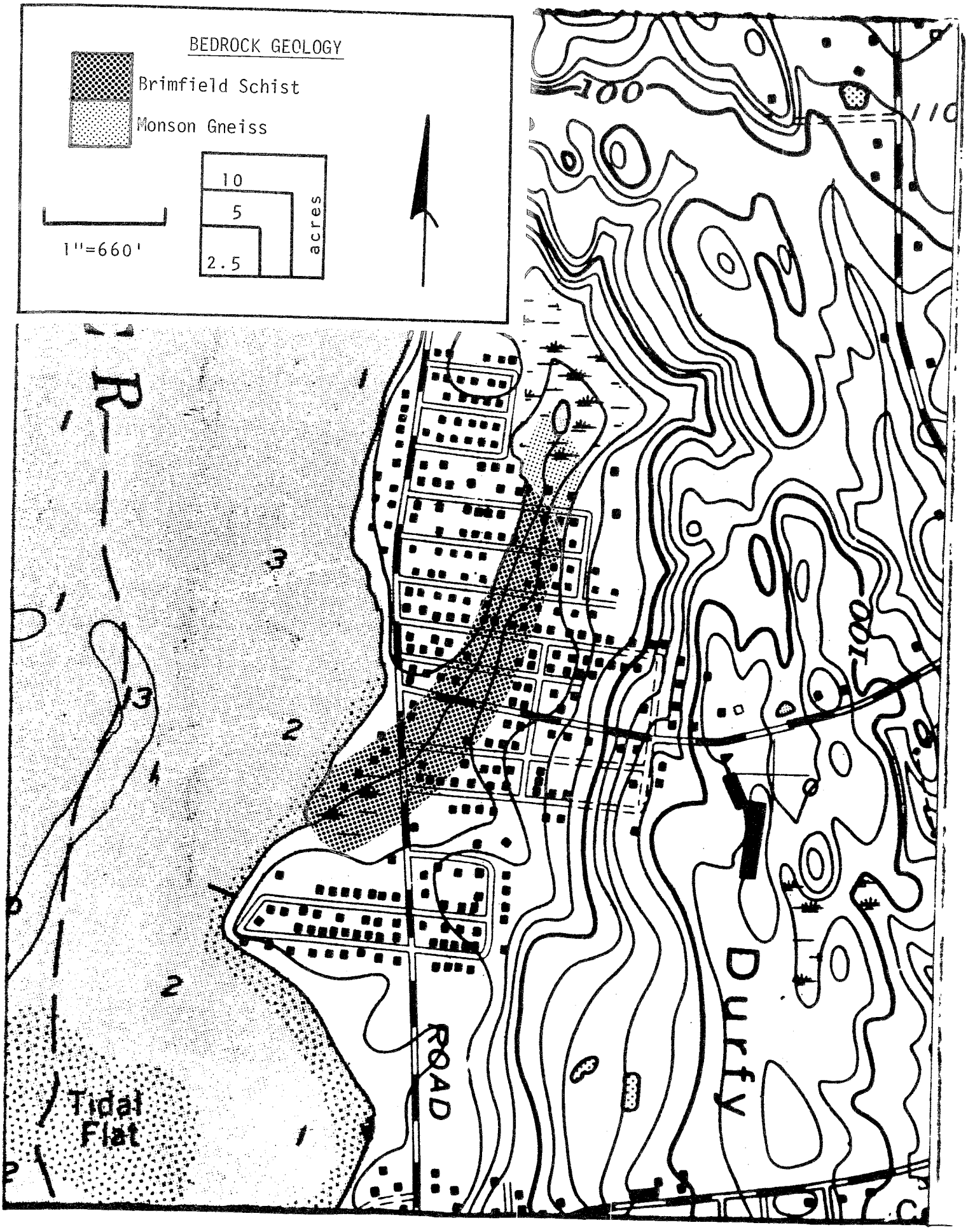
The watershed of Noname Brook is about 220 acres based on the natural topography. It should be pointed out that the boundary shown in the accompanying Watershed Boundary Map does not account for possible drainage re-routing through man-made structures, i.e., storm drainage for road systems. A watershed may be defined as the entire area that contributes surface runoff to a stream from the headwater region of the stream to a designated point of outflow (see the Watershed Boundary Map).

Development in the watershed, which is almost entirely residential, is concentrated in the southwest corner. Noname Brook bisects this densely developed area enroute to Niantic River. It is mainly in this area where Noname Brook will be upgraded, i.e., rechanneled, existing culverts replaced, etc. The land surface rises moderately to the north and east of the residential area to some flat-topped upland areas. The northern and eastern parts of the watershed are not developed at the present time.

GEOLOGY

Noname Brook and its watershed is located in an area encompassed by the Niantic topographic quadrangle. Bedrock and surficial geologic maps of the quadrangle have been prepared by Richard Goldsmith and published by the U.S. Geological Survey (Maps GQ-575 and GQ-329, respectively).

Bedrock underlying the section of Noname Brook to be upgraded is classified by Goldsmith as Brimfield Schist. These rocks consist of gray to dark gray schists, and gneisses composed mainly of the minerals quartz, feldspar, biotite, and garnet. "Schist" is a textural term given to rocks which under high pressure and temperature conditions were altered in such a way that most of its mineral constituents were aligned parallel to each other. Parting surfaces are usually numerous and give the rock a slabby appearance. "Gneisses" are also rocks which were altered under high pressure and temperature conditions; however, its mineral arrangement produces a banded appearance in the rock. The banding is due to layers of light granular minerals (quartz and feldspar) which alternate with relatively narrow bands of platy, flaky or elongate minerals (biotite) and which are usually dark colored. Often layers of schist and layers of gneiss may be found intermixed in an outcrop.


BEDROCK GEOLOGY
Brimfield Schist
Monson Gneiss
1"=660'
10
5
2.5
acres
100
110
100
Durfy
ROAD
Tidal Flat
3
2
1
3
2
1
2
1

Because the depth to bedrock along the section of Noname Brook to be upgraded is relatively deep (ranging from 10 to 40 feet), bedrock is unlikely to be a hindrance to the proposed project.

Those unconsolidated mineral andorganic particles overlying bedrock in the study area consist of stratified drift deposits and salt-marsh (tidal) deposits.

The entire length of Noname Brook to be upgraded is underlain by stratified drift deposits. These sediments, which consist of interbedded pebble gravel, sand and lesser amounts of cobble gravel, were deposited by glacial meltwaters. Stratified drift deposits were sorted by the flowing meltwater streams and were deposited in regular or irregular layers.

Thicknesses of the stratified drift deposits range from about 10 feet under the northern half of the stream up to about 40 feet of stratified drift under the southern half.

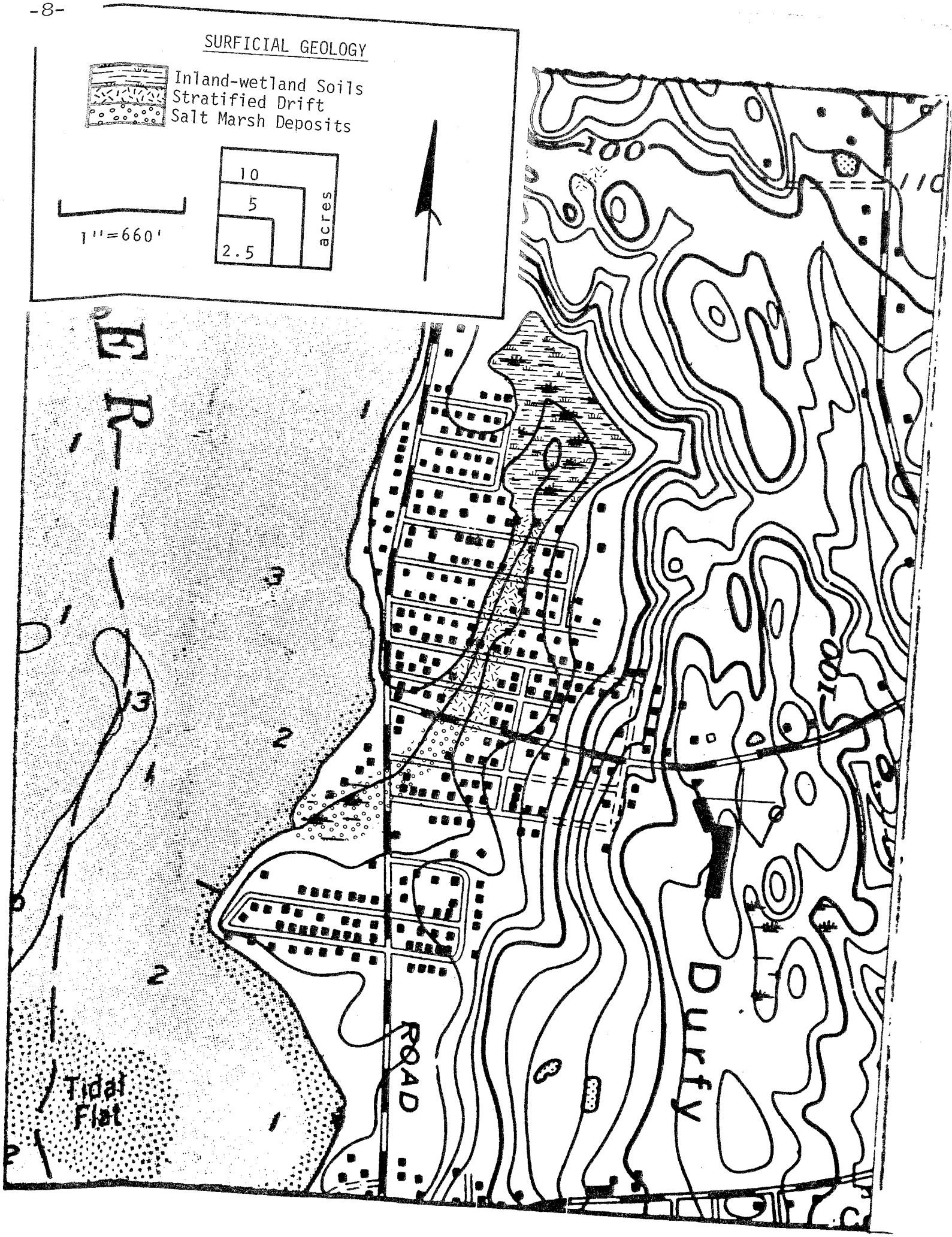
Salt-marsh deposits developed over stratified drift at the mouth of the Brook. These deposits appear to parallel the streamcourse from Daniel Avenue south to its outlet into Niantic River. "Salt-marsh" deposits consists of partly decomposed organic material mixed or interbedded with estuarine silt, mud and sand. Thickness of the organic material in these deposits may range from 16 to 51 inches.

Becuase tidal wetlands are affected by daily tides these soils are wet throughout most of the year. The salt-marsh soils are delineated as Pa (Pawcatuck muck peat) on the soils map, and would be considered regulated wetland soils. Because wetland soils (tidal or inland) in the State of Connecticut are regulated under Public Act No. 155, any disturbance or modification (filling, dredging, etc.) of these soils will first need all the necessary permits from the town or State. It should be pointed out that there may be pockets of seasonally wet soils astride Noname Brook north of the tidal wetland boundary. As indicated by the Application Inalnd Wetlands and Watercourse Permit, Noname Brook is designated as a wetland because it is a watercourse, "not because of its soil characteristics."[1] Therefore, all necessary permits regarding modification, filling, etc. of tidal or inland wetland areas along Noname Brook will also need to be secured from the Inland-Wetland's Commission before any work has begun.

Most of the eastern and northern parts of the watershed are covered by a relatively thin blanket of till (probably not much more than 10 feet). The till, which is locally called "hardpan" contains rock particles ranging in size from clay to large boulders. Unlike the stratified drift deposits mentioned, the till is neither sorter nor stratified; the rock particles were indiscriminantly mixed and deposited directly without sorting by meltwater issuing from glacier ice.

---

[1] Application for Inland Wetlands and Watercourse Permit for Noname Brook, Town of Waterford, Connecticut.


SURFICIAL GEOLOGY
Inland-wetland Soils
Stratified Drift
Salt Marsh Deposits
1"=660'
10
5
2.5
acres
100
110
E R
P'
3
2
1
2
Tidal Flat
ROAD
Durfy

Present plans indicate that a section of the tidal wetlands between Second Street and Daniel Avenue would be filled in order to better define the brook's channel. According to the application, it will consist of a seven foot trapezoidal base riprapped channel. Approximately 790 cubic yards of "quality satisfactory" fill material is estimated for the filling operation. As mentioned earlier in the report, this portion of the brook is comprised of tidal wetland soils which contain organic material. The exact thickness of the organic material in this area is unknown. Provisions should probably be made to determine the thickness of organic material and to remove all unstable material in this area before placing any fill material.

The proposed rechannelization project and upgrading of Noname Brook should be done during the dry time of the year and should include provisions of effective erosion and sediment control.

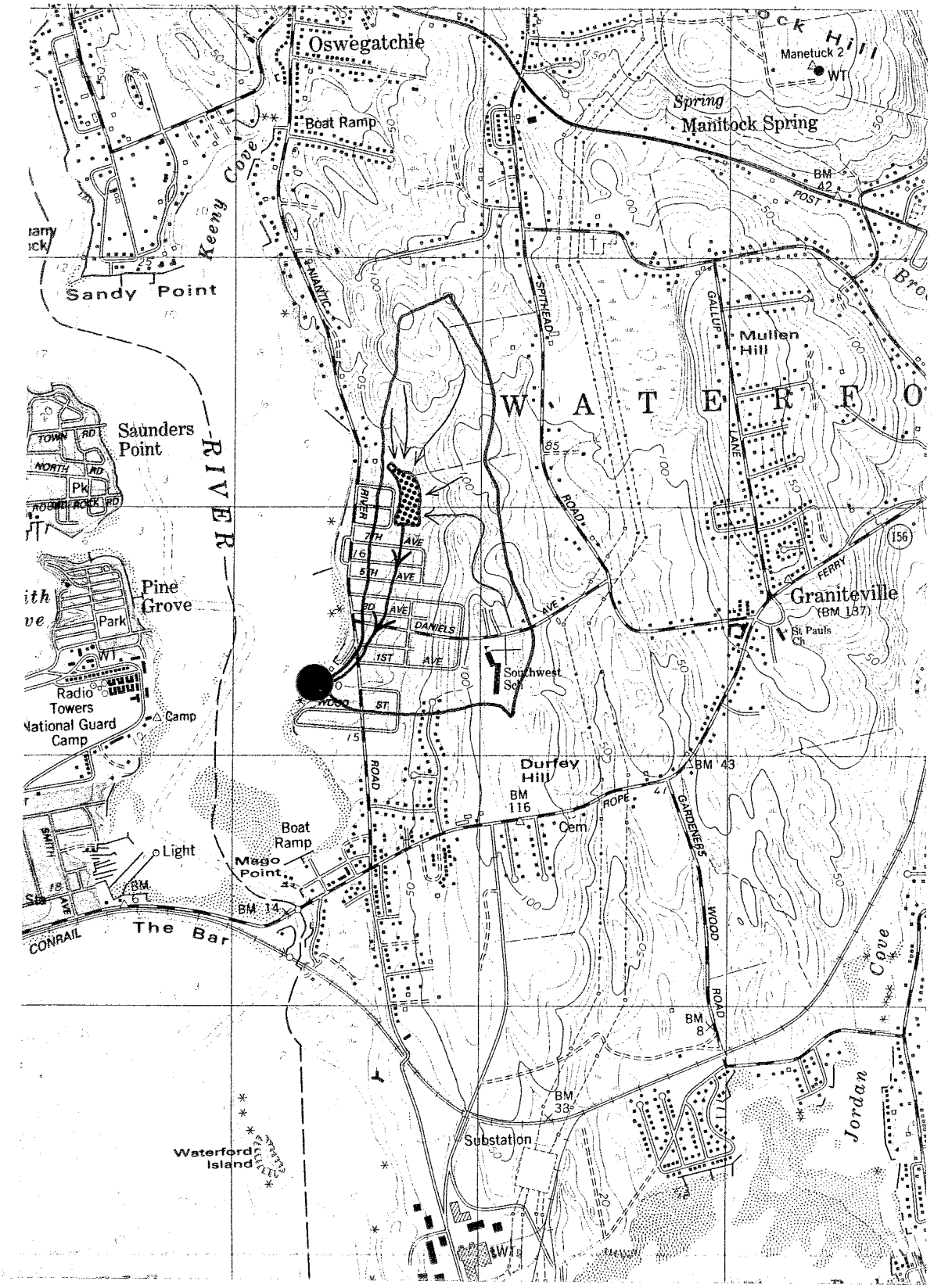
HYDROLOGY

As mentioned earlier, Noname Brook receives drainage from a watershed of approximately 220 acres. A map showing the watershed boundary is included with this report. No other major streamcourse appears to be present in the watershed. Several intermittent streams primarily in the northern and eastern parts of the watershed feed the brook. A small pond surrounded by wetlands is located in the central parts of the watershed.

The proposed project which includes the replacement of existing improperly installed culverts along the brook, storm drainage improvements along streets bisected by the brook, reshaping the channel bottom of the brook, etc., should result in an overall improvement to the environmental health of the brook. It should also enhance the aesthetics of the brook.

The planned extension of municipal sewers to homes in the densely developed part of the watershed will eliminate the need for the individual on-site septic systems presently serving these homes. It is understood that residences will be required to connect to the sewer line once it becomes available. This should significantly reduce the chances of groundwater contamination by septic effluent finding its way into the brook. Town officials indicated on the review day that bacteriological levels are elevated in the Niantic River near the mouth of Noname Brook. As a result, this area is closed to shellfish harvesting. It is assumed that problems with possible malfunctioning septic systems in the Noname Brook watershed may be a likely source for the elevated bacteriological levels, although no failing septic systems were visible on the review day. Nevertheless, public sewers should help eliminate this problem.

Based on a cursory inspection of the brook, particularly in the tidal wetlands, it appears that there is a strong need for better flushing action. Flushing action appears to be restricted in this area mainly due to sediment build-up largely from road sand in addition to assorted debris, i.e., branches,



WATERSHED BOUNDARY

Noname Brook Watershed

Point of Outflow

Noname Brook Showing Direction of Flow

Intermittent Streamcourses

Surface Water Body

Scale 1"=2000'

pieces of wood, etc., in the streamcourse. As a result of sediment build-up and accumulated debris in the watercourse, stagnant water conditions may develop. Also, in a verbal discussion with the Team's biologist, Ron Rosza, the natural creation of sand spit across the mouth of Noname Brook may also be restricting flushing action in Noname Brook, especially during low tide.

It is recommended that an inspection of the streamcourse be made, particularly in the tidal wetlands for possible obstructions which would reduce flushing action. The removal of these obstructions and/or accumulations of sediment would hopefully promote better flushing action. Also, the construction of a groin north of the outlet may help eliminate the sand spit thereby increasing flushing action from the Niantic River. If a groin is constructed, a regular maintenance program will need to be considered by the Town so that accumulated sediment is properly removed. In addition, potential stream bank erosion problems at the mouth of Noname Brook will need to be considered.

The inlets and outlets of newly installed cross culverts, which carry Noname Brook under the affected streets should be checked on a regular basis to ensure that sediment does not build-up, especially since the proposed pitch of the pipes is almost flat. This will, hopefully, eliminate potential flooding problems at these points.

As mentioned earlier, the northern and eastern parts of the watershed are only lightly developed. Intense development in these areas would be expected to increase the amount of surface runoff produced during periods of rainfall. The increases will arise from conversion of permeable soils to impermeable surfaces (roofs, paved driveways, roads, etc.), and from the removal of vegetation. The added runoff could cause increased stream channel erosion and it could also increase the peak flood flows of Noname Brook. The small pond and wetland area in the central parts of the watershed appear to be in a good hydrologic position to serve as a detention basin for future development, particularly in the northern parts of the watershed. In this regard, each prospective developer in undeveloped parts of the watershed should do his part in controlling stormwater from their respective developments.

Consideration by the project engineer should be given to possible future developments in the northern and eastern parts of the watershed with regard to sizing the new cross culverts under affected streets along Noname Brook.

The proposed project indicates that Noname Brook will be diverted around an existing home on Fourth Avenue. The brook is presently piped under the house. Because Noname Brook has a watershed area greater than 100 acres, this modification will probably require a diversion permit pursuant to P.A. 402 (The Connecticut Water Diversion Policy Act). The Town should contact Dennis Cunningham at the Water Resources Unit, Department of Environmental Protection at 566-7220 regarding this matter (see PART TWO, WETLAND TYPE AND JURISDICTION, State Permit Programs C.).

SOILS

The soils in the project area consist of:

Aa-Adrian and Palms mucks

These nearly level, very poorly drained soils are in pockets and depressions of stream terraces, outwash plains, and glacial till uplands. Slopes range from 0 to 2 percent. Mapped areas consist of either Adrian soils or Palms soils, or both. These soils were mapped together because there are no major differences in most uses and management. Adrian soils have a high water table which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and rapid in the substratum. The available water capacity is high. Runoff is very slow or ponded. Adrian soils are strongly acid through slightly acid. Palms soils have a high water talbe which is at or near the surface for most of the year. Permeability is moderately rapid in the organic layers and moderately slow in the substratum. The available water capacity is high. Runoff is very slow or ponded. Palms soils are strongly acid through slightly acid.

Sg-Sudbury sandy loam

This nearly level to gently sloping, moderately well drained soil is on outwash plains and stream terraces. Slopes range from 0 to 5 percent. The Sudbury soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is slow or medium. Sudbury soil warms up and dries out slowly in the spring. Unless limed, it is strongly acid or medium acid. This soil is well suited to cultivated crops. This soil is in capability subclass IIw.

Ud-Udorthents-Urban land complex

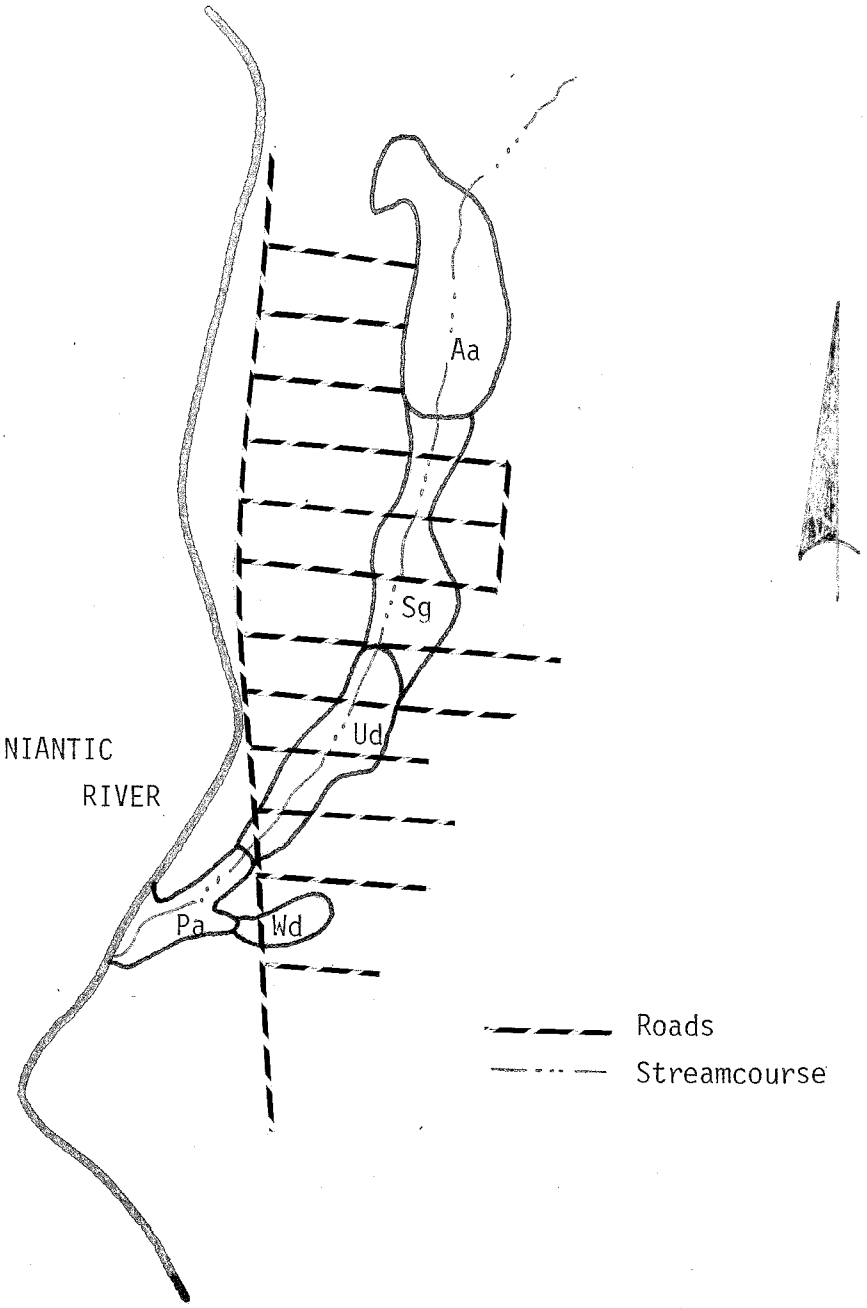
This complex consists of excessively drained to moderately well drained soils that have been disturbed by cutting or filling, and areas that are covered by buildings or pavement. Slopes range from 0 to 15 percent. The areas of Udorthents and Urban land are so intermingled that it was not practical to map them separately. Permeability of the Udorthents is slow to very rapid. The available water capacity and runoff are variable. This complex requires onsite investigation and evaluation for most uses. This complex is not assigned to a capability subclass.

Pa-Pawcatuck mucky peat

This nearly level, very poorly drained soil is on tidal marshes adjacent to Long Island Sound and Fishers Island Sound. The Pawcatuck soil has a high water table at or above the surface for most of the year. It is subject to daily inundations by saltwater. Permeability is moderate through rapid in the organic layers and very rapid in the underlying mineral sediment. The

United States Department of Agriculture

Soil Conservation Service



Scale 1"=660'

Soil boundary lines were derived from a smaller scale map and should not be viewed as precise boundaries but rather as a guide to the distribution of soils on the property.

available water capacity is high. Runoff is very slow, or the soil is ponded. The soil is strongly acid through neutral. If drained, it becomes extremely acid and toxic to plants. This soil is not suited to cultivated crops or trees because of the high salt content. This soil is in capability subclass VIIIw.

An Erosion and Sediment Control Plan must be prepared which consists of the following:

A. A narrative describing:

1. the development;

2. the schedule for grading and construction activities;

   a. start and completion dates;

   b. sequence of grading and construction activities;

   c. sequence for installation and/or application of soil erosion and sediment control measures;

   d. sequence for final stabilization of the project site;

3. the design criteria for proposed soil erosion and sediment control measures and stormwater management facilities;

4. the construction details for proposed soil erosion and sediment control measures and stormwater management facilities;

5. the installation and/or application procedures for proposed soil erosion and sediment control measures and stormwater management facilities;

6. the operations maintenance program for proposed soil erosion and sediment control measures and stormwater management facilities.

B. A site plan map at a sufficient scale to show:

1. the location of the proposed development and adjacent properities;

2. the existing and proposed topography including soil types, wetlands, watercourses and water bodies;

3. the existing structures on the project site, if any;

4. the proposed area alterations including cleared, excavated, filled or graded areas and proposed structures, utilities, roads and, if applicable, new property lines;

5. the location of and design details for all proposed soil erosion and sediment control measures and stormwater management facilities;

6. the sequence of grading and construction activities;

7. the sequence for installation and/or application of soil erosion and sediment control measures;

8. the sequence for final stabilization of the development site.

ENGINEERING CONCERNS

The stage in Niantic River, as stated in the calculations presented, for the 10 year flood is elevation 6.7, the 50 year flood is elevation 9.4 and for the 100 year flood is elevation 11.0. The drainage area for the Niantic River is about 31 square miles. A 10 year frequency storm could produce flood stages in Noname Brook without producing a 10 year flood stage on the Niantic River. If this situation should occur, then velocities in the reach between Sixth Avenue and Fifth Avenue would be in excess of 3 feet per second which would cause erosion of the natural materials; therefore, modified riprap should be used for this reach. The larger the storm, the less the probability of it occurring just on the watershed of Noname Brook; therefore, the probability of a local storm flooding (50 year or 100 year frequency) Second Avenue through Seventh Avenue, without Niantic River flooding is not very likely.

This is a very difficult project to calculate stream flow and flood flow because of the influence of Niantic River and the tide. The Team engineer feels that the culverts are sized realistically, even though he disagrees with some of the peak discharges presented in the calculations. The residents must realize that during the floods of even the 10 year frequency storm, there will be flooding of many avenues in this watershed.

The excavation along the stream varies from zero to 2.5 feet of silt, sands, and organic material. This material will be saturated and difficult to control if placed in the low areas along the stream, and to maintain a desired side slope. Also, granular material, when placed on top of the organic silt, will displace this unstable material.

The description of the brook channelization on paragraph 32 states that work will start at Seventh Avenue and proceed downstream. The Team engineer questions this procedure for starting the excavation at the upstream end. The normal procedure for doing this kind of work, that he is familiar with, starts at the downstream end and proceeds up. The phasing of the job is important. The sediment control measures are also important.

MOSQUITO CONTROL

Investigation of the area of Noname Brook from the half-acre pond northeast of Tenth Avenue to the Niantic River was made by the Team member from the Mosquito and Vector Control Section of the Connecticut Department of Health Services accompanied by Mr. E. Spencer, also of that department.

Their findings concerning mosquito breeding sites are:

1. Noname Brook emanates from a small pond (consisting of 100% run-off water) flows intermittently along the base of high land (elevation 150') east of fourteen residential streets between Niantic River Road and Noname Brook, and travels 2500' to the Niantic River.

2. Noname Brook, the street drains, and catch basins, through which the brook flows were dry during the investigation.

3. Reported numerous sewage system overflows, mosquitoes, and breeding sites along Noname Brook were not evident at the time of this investigation. Depressions and irregular sides along the brook trap water that become mosquito breeding sites.

There has not been any mosquito control measures, i.e., drainage ditching, filling of depressions, blockage removal, and clearing of brook sides, or larviciding of potential breeding sites in the Noname Brook area.

There has been recent installation of sanitary and storm sewers along Niantic River Road from Tenth Avenue to Bishop Street. The installation of sanitary and storm sewers in the fourteen street area of Noname Brook is scheduled for the coming year. Connection of house drains to the sanitary sewers and drainage of run-off water through storm drains in the area will prevent standing water pools in the Noname Brook area.

The environmental impact of rechanneling Noname Brook would be that of eliminating and preventing potential mosquito breeding sites.

MARINE FISHERIES CONCERNS

The marine biologists reviewing this site made two field inspections. The first on August 15, and again on September 15.

Site Description

The Niantic River is a coastal embayment in relatively undisturbed and good condition. Pollution resulting from septic system failure and siltation caused by upland and bank erosion are cited as the major problems affecting the river system (Anderson-Nichols, 1981). Sanitary sewer system construction

is currently underway and seepage from septic systems will be reduced or eliminated with the operation of these sewers.

The river supports a diverse population of shellfish and a recreational fishery exists for scallops (Aequipecten irradians), hardclams (Mercenaria mercenaria), and soft clams (Mya arenaria). The river also supports seasonal, as well as year-round populations of commercially and recreational important finfish species including: striped bass (Morone saxatilis), summer flounder (Paralichthys dentatus), juvenile and adult bluefish (Pomatomus saltatrix), and blackfish (Tautoga onitis). The Niantic River is an important spawning, nursery and winter concentration area for winter flounder (Pseudopleuronectes americanus). A trawl monitoring program conducted by Northeast Utilities Environmental Laboratory indicates that the river adjacent to the wetland associated with Noname Brook is a productive area for juvenile winter flounder (NUSCo. 1985).

The brook under review flows south discharging through a tidal wetland into the Niantic River. The wetland immediately adjacent to Niantic River Road is dominated by Phragmites communis, a reed which typically colonizes disturbed brackish or freshwater areas. There is a heavy layer of sand, silt, and unconsolidated organic matter in the stream bed. Progressing downstream, vegetation is dominated by more salt tolerant species, including Spartina alterniflora and Spartina patens. The substrate in the more southerly portions of the stream is composed by a thin layer of sand and silt and an abundance of forage fish were observed. The shallows of the river outside the marsh are composed of a hard, sandy substrate. Biota observed during snorkeling included mud snails (Nassarius obsoletus), clam and scallop shells and large patches of brown (Fucus sp. and Ascophyllus sp.) and green (Codium sp.) seaweeds were observed on the bottom. The more central portions of the river support extensive eelgrass (Zostera marina) and shellfish beds. Eelgrass beds provide a substantial amount of primary productivity and are utilized as shelter and nursery habitat by finfish and invertebrates. Much of the area influenced by discharge associated with Noname Brook is closed to shellfishing due to high concentrations of coliform bacteria. While much of the problem is attributable to septic system failures upstream, an abundance of waterfowl were observed that no doubt contribute to water quality problems.

CONCERNS

Salt marshes are extremely critical in the life cycle of many marine finfish species. In the Niantic River a few pockets of saltwater wetland represent a limited habitat for a vareity of species in the area (Anderson-Nichols 1981). Because of this, our primary concerns lie with the effects of this project on the tidal wetland area and on the river itself.

Generally, the system of land drainage in coastal areas should be retained in a form as near to the natural pattern as is possible. For protection of coastal waters, the best stormwater system is one that closely simulates natural

flow characteristics, that is, one that has features to detain storm runoff and to maximize filtration for natural purification (Clark 1977). Because the natural drainage pattern of the brook has already been altered by past projects, proposed activities are designed to improve existing flow patterns and erosion problems. However, if the volume and rate of flow of runoff coastal waters are significantly affected, potential impacts include changes in existing salinity patterns and increased sediment transport. These changes could, in turn, affect the physical makeup of the estuarine ecosystem and associated biota. A significant change in the natural timing or delivery of stream flow can have adverse effects on organisms by disrupting salinity related functions such as breeding, migration and feeding. Also related to the volume and rate of flow are the amounts and dispersal rates of pollutants transported into the river. With more efficient drainage patterns, runoff could drain more quickly, possibly reducing the filtering effect of the stream bed and wetland area. The problem lies in determining whether the increased flow rates and volumes resulting from this project will be significant to induce marked changes in salinity patterns, and downstream dispersal of sediments and pollutants. Much of the solution lies in the control and clean up of present sewage discharge problems and control of erosion and sedimentation.

Construction activities include grading and excavation of the stream bed. These activities may temporarily increase the sediment load in the runoff from the construction site, consequently increasing nutrient load and turbidity. Finer sediments may settle further out into the river, potentially affecting shellfish and eelgrass beds. Construction should be done in a manner that will minimize environmental disturbance, especially in wetland areas. Sedimentation and erosion control measures have already been addressed in the plan and include: sedimentation control basins, runoff diversions, riprap, and erosion control plantings. In addition, vegetated drainage ways should be retained whenever possible, construction should be staged to avoid excavation during high flow periods and wetland areas should be kept clear of construction related debris and materials.

Although plans are currently unclear, it is the marine biologists understanding that the lower reaches of the brook (south of Niantic River Road) are proposed to be dredged. It is thought that dredging this area will serve to increase flushing, and will eliminate an accumulation of organic matter ("black mayonnaise") that has collected at the brooks outlet (in particular, the area adjacent to Niantic River Road). The need for dredging should be carefully considered and the DEP Marine Fisheries Program would like to be kept informed on further developments on this aspect of the project.

Temporary sedimentation resulting from dredging activities could suffocate surrounding biota and if severe enough, could adversely affect the shellfish and eelgrass beds in the river. In addition, dredging may release pollutants and pathogenic organisms associated with sewage discharge. Coliform and fecal coloform bacteria in bottom sediments have been positively correlated with the presence of fecal pollution in overlying waters. These fecal indicator organisms were also shown to be more numerous in sediments suggesting greater survival after sedimentation (Babinchak et al.). Conversely, if not dredged

these sediments and associated pollutants (if present) will slowly be released during high flow periods. Perhaps sediments can be tested to determine the concentration of coliform bacteria and the best methods of removal can then be recommended. In addition, any excavation or deepening of the channel in the tidal wetland will increase saltwater intrusion, thus altering existing vegetation patterns. In some respects, this could be advantageous.

To avoid interference with spawning shellfish and finfish, including winter flounder which spawn during February, March and April, it is suggested that dredging activities be limited to November-January. The shellfish commission should also be consulted on this matter. It is imperative that the tidal wetland be kept clear of construction materials and dredge spoils.

SUMMARY

NOTE: This is a very brief summary of the major points, concerns, and recommendations of the Team for PART ONE. You are strongly urged to read the entire report, and to refer back to the specific sections in order to obtain all the information about a certain topic.

TOPOGRAPHY AND SETTING

-- Noname Brook is a relatively small streamcourse located in the western part of Waterford. It originates in a small pond and empties into the Niantic River. The watershed is approximately 220 acres as defined by the topography. Development within the watershed is mostly residential, and is concentrated in the southwest corner. The northern portions of the watershed are not developed at this time.

GEOLOGY

-- Bedrock underlying the area of Noname Brook to be upgraded is classified as Brimfield Schist. Because the depth to bedrock is deep (10-40 feet), bedrock is unlikely to be a hindrance to the proposed project.

-- The surficial geologic material in the project area consists of stratified drift deposits and salt-marsh (tidal) deposits. The wetland soils are regulated under Public Act No. 155, and any modification of these soils will require the necessary town or State permits.

-- In areas that are to be filled, the exact thickness of the organic material should be determined, and all unstable material removed before placing any fill material.

-- The proposed rechannelization and upgrading should be done during the dry time of year.

HYDROLOGY

-- The proposed project should result in an overall improvement to the environmental health of the brook.

-- It appears that there is a need for better flushing action, particularly in the tidal wetland area. The natural creation of a sand spit across the mouth of Noname Brook may be restricting flushing action.

-- It is recommended that an inspection of the streamcourse be made to look for possible obstructions which could reduce the flushing action.

-- The construction of a groin north of the outlet may help eliminate the sandpit, thereby increasing flushing action from the Niantic River.

-- The small pond and wetland area in the central part of the watershed appear to be in good hydrologic position to serve as a detention basin for future development in the northern parts of the watershed.

-- The project engineer should give consideration to future development in the northern and eastern portions of the watershed with regard to sizing the new cross culverts under affected streets along Noname Brook.

SOILS

-- The soils in the project area are comprised of Adrian and Palms mucks, Sudbury sandy loam, Udorthents and Pawcatuck mucky peat.

-- An Erosion and Sediment Control Plan (ESC) must be prepared which contains a narrative and a site plan map.

ENGINEERING CONCERNS

-- Modified riprap should be used in the reach between Sixth Avenue and Fifth Avenue to prevent erosion of natural materials.

-- The team engineer feels that the culverts are sized realistically, even though he disagrees with some of the peak discharges presented in the calculations.

-- The excavation of material and filling may present problems of control, maintenance and stability.

-- The team engineer questions the procedure for starting the excavation at the upstream end. The normal procedure that he is familiar with is to start work at the downstream end and proceed up.

-- The phasing of the construction is very important.

MOSQUITO CONTROL

-- The environmental impact of rechanneling Noname Brook would be that of eliminating and preventing potential mosquito breeding sites.

MARINE FISHERIES CONCERNS

-- Generally, the system of land drainage in coastal areas should be retained in a form as near to the natural pattern as possible.

-- The problem lies in determining whether the increased flow rates and volumes resulting from this project will be significant to induce marked changes in salinity patterns, and downstream dispersal of sediments and pollutants.

-- Much of the solution lies in the control and clean up of present sewage discharge problems, and in the control of erosion and sedimentation.

-- Construction should be done in a manner that minimizes environmental disturbance, especially in wetland areas.

-- Vegetated drainage ways should be retained whenever possible.

-- Construction should be staged to avoid excavation during high flow periods and wetland areas should be kept free of construction related debris and materials.

-- The need for dredging the brook outlet should be carefully considered, and the DEP Marine Fisheries Program would like to be kept informed on this project.

-- Dredging may release pollutants and pathogenic organisms associated with sewage discharge.

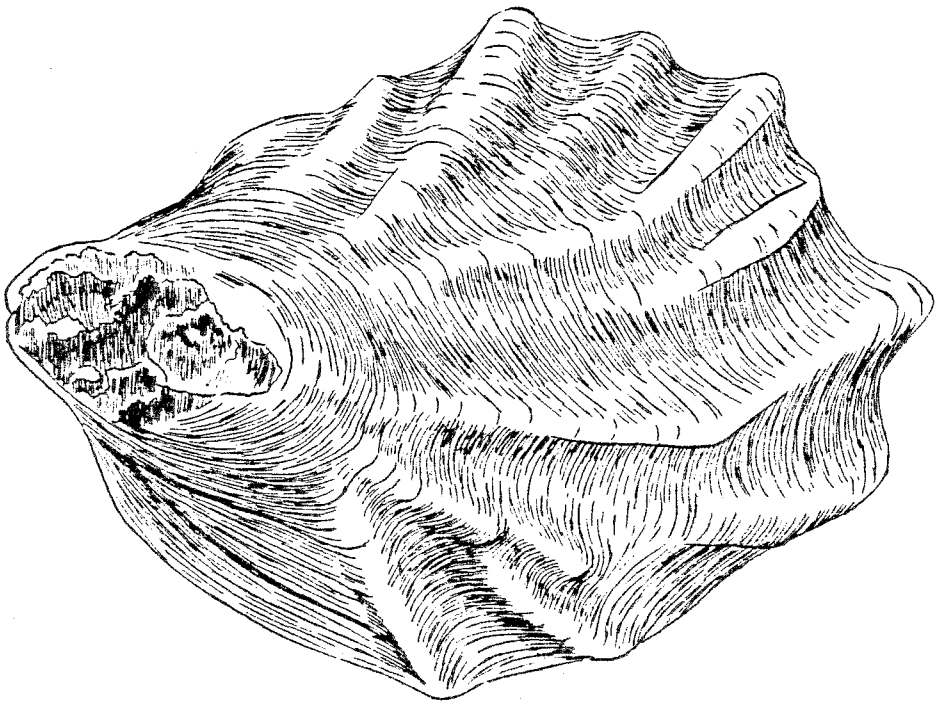
-- Perhaps sediments can be tested to determine the concentration of coliform bacteria and the best method of removal determined.

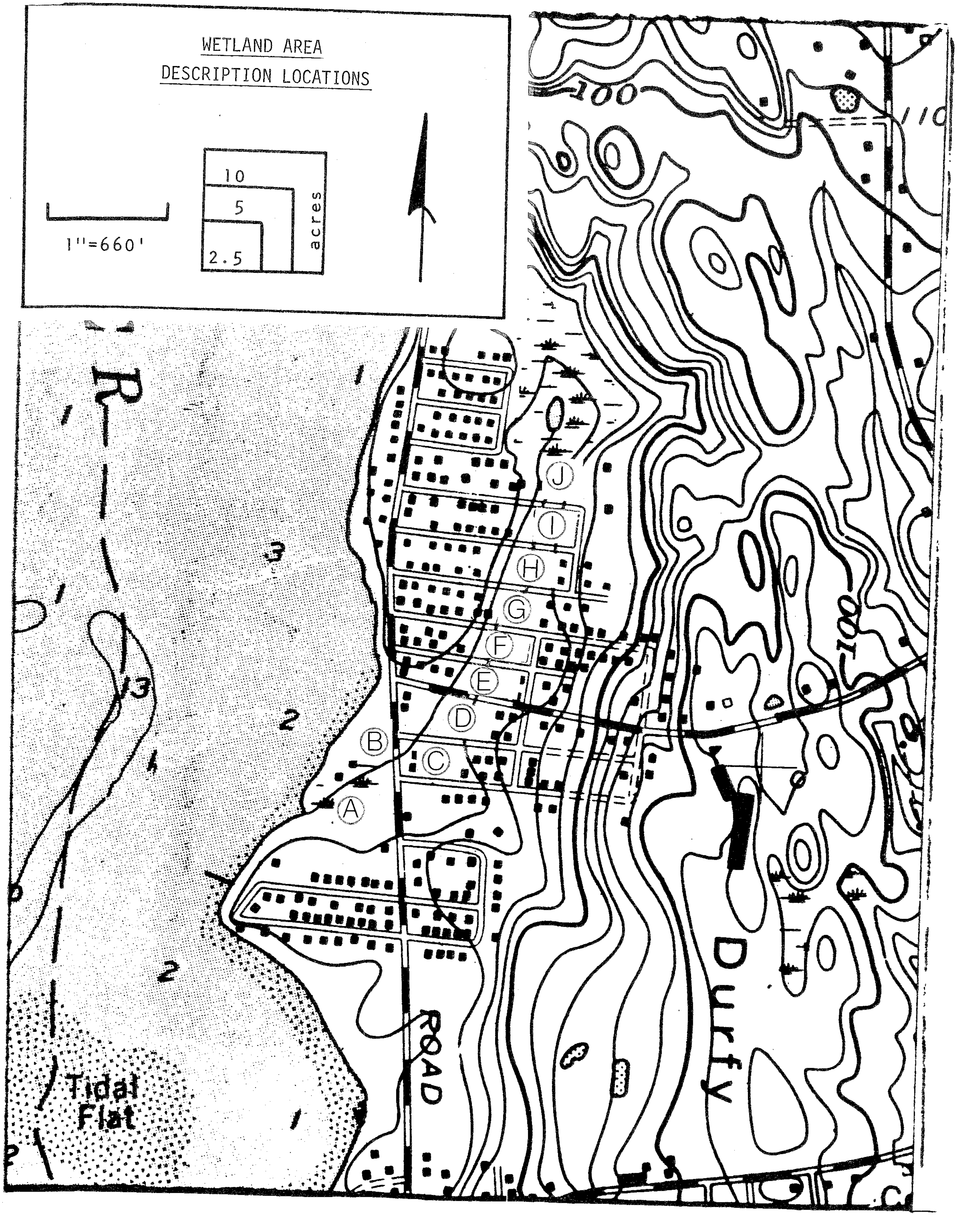
-- Saltwater intrusion could be increased thereby altering existing vegetation.

-- To avoid interference with spawning shellfish and finfish which spawn during February, March and April, it is suggested that dredging activities be limited to November-January. The Shellfish Commission should also be consulted on this matter.

-- It is of the utmost importance that the tidal wetland be kept clear of construction materials and dredge spoils.

PART TWO




WETLAND AREA
DESCRIPTION LOCATIONS
10
5
2.5
acres
1''=660'
100
110
R
Tidal Flat
ROAD
Durfy
A
B
C
D
E
F
G
H
I
J

DESCRIPTION OF WETLANDS

Noname Brook is a small watercourse located between a freshwater wetland located north of Seventh Avenue and the tidal Niantic River. Under normal conditions, Noname Brook is tidal nearly to the extent of Daniels Avenue. The extent and frequency of tidal action may have increased when the culvert under Niantic River Road was replaced. North of this road the Brook is freshwater and non-tidal. The Brook has been subdivided into the following subunits to allow for description of the major vegetation types and wetland conditions:

Area A. This is a tidal and saline section of the Brook. Salinity levels measured 28 ppt (parts per thousand) during an ebbing tide. In contrast, the level in Niantic River was 32 ppt. A submerged sandbar extends southward across the mouth of the Brook which, at low tide, is exposed and therefore reduces the width of the inlet.

The primary wetland here is an emergent estuarine wetland or salt marsh. Dominant are the high marsh grasses Salt-meadow Cord-grass (Spartina patens) and Spike Grass (Distichlis spicata). Along the edge of the Brook, Salt-marsh Cord-grass (Spartina alterniflora) is the dominant plant on low marsh habitat.

Area B. This section is located between the principal tidal wetland area and Niantic River Road. Area A and B are somewhat separate hydrologically due to one or more elevated sills in the creek bed. Water becomes ponded in area B at low tide which may also account for the accumulation of "black mayonnaise." Salinity levels measured between 4 to 6 ppt during an ebb tide. In part, this low salinity value was a function of freshwater drainage into this section at low tide. On a flood tide, higher values would be expected. However, the dominant vegetation, which reflects average environmental conditions is a low salinity type. Low marsh adjacent to the Creek supports Salt-marsh Cord-grass. High marsh support a mixture of plants including Salt-meadow Cord-grass, Spike Grass, New York Aster (Aster novibelgii), Marsh Elder (Iva frutescens) and Seaside Goldenrod (Solidago sempervirens).

Mudflat areas within the marsh complex support carpets of a short, grass-like plant called Spike Rush (Eleocharis parvula). This plant grows exclusively in slightly saline areas and is a preferred diet plant for waterfowl.

The upland border of the marsh supports colonies of Reed (Phragmites australis), Gama-grass (Tripsacum dactyloides), Marsh Elder and Poison Ivy (Toxicodendron radicans).

Area C. This short section between Niantic River Road and Second Avenue is tidal and slightly saline. The dominant plant cover is Common Reed. In places, especially along the upper border, Gama-grass is dominant.

Area D. Upstream of Second Avenue nearly to Daniels Avenue, the marsh is tidal and slightly saline. The measured salinity value was 10 ppt. It may be the case that the installation of the new culvert under Niantic River Road has converted a mostly non-tidal marsh to a tidal marsh. In the center of this marsh are mudflats with a high organic and water content. The soil for the most part is an unstable muck. The dominant plant on the mudflat is Spike Rush. Encircling the mudflat is a dense growth of Common Reed.

Area E. South of and immediately adjacent to Daniels Avenue is a small freshwater pond. Growing along the border of the pond are the following plants: Water Plantain (Alisma triviale), Spike Rush (Eleocharis obtusa), Rush (Juncus sp.), Bur-reed (Sparganium sp.) and Reed Canary Grass (Phalaris arundinacea).

Area F. From Daniels to Third Avenue, the wetland is a freshwater scrub/shrub type. Red Osier Dogwood (Cornus racemosa) was the most prevalent shrub. In the wetter areas adjacent to the creek, a variety of herbaceous plants are to be found. These include the following:

Jack-in-the-Pulpit	Arisaema atrorubens
Marsh Fern	Thelypteris palustris
Touch-me-Not	Impatiens capensis
Bur-reed	
Sensitive Fern	Onoclea sensibilis
Poison Ivy	
Swamp Milkweed	Asclepias incarnata
Joe-pye-Weed	Eupatorium sp.
Rush	Juncus sp.
Arrow-leaved Tearthumb	Polygonum sagittatum
Tussock Sedge	Carex stricta
Boneset	Eupatorium perfoliatum

Area G. Between Third and Fourth Avenue, the wetland supports a vegetation similar to that described for Section F. Stormwater runoff on Fourth Avenue has carried sand into the creek and culvert.

Area H. To the north of Fourth Avenue the Brook flows through a long culvert that lies under a residential structure. Between the house and Fifth AVenue, the wetland is a swale that was dry at the time of inspection. The following wetland plants were growing upon the moist to wet soils of the swale:

Pinkweed	Polygonum pensylvanicum
Beggar's Tick	Bidens sp.
Touch-me-Not	
Boneset	
Tear-thumb	
Reed Canary Grass	

Area I. This stretch of brook located between Fifth and Sixth Streets is principally a grassy swale that is regularly mowed.

Area J. Here the brook is a swale underlain by sand and gravel. Growing on the moist to wet soils of the swale are Touch-me-Not, Clearweed (Pilea pumila) and Pinkweed. The banks are lined with evergreens. North of Seventh Avenue the brook is also a swale.

WETLAND TYPE AND JURISDICTION

Noname Brook can be divided into tidal and non-tidal sections. Areas A-D inclusive are subject to tidal action and support tidal wetland vegetation. Therefore, this section of the Brook can be technically classified as tidal wetland of fact. North of Area D, the Brook is non-tidal freshwater wetland and watercourse. Regulatory jurisdiction for the various sections of the Brook are briefly discussed below.

Federal Agency Programs

A. Section 10 of the River and Harbor Act regulates activities in navigable waters of the U.S. For Connecticut, navigable waters are defined as all tidal waters and their tributaries to the head of tide. In Noname Brook, the head of tide occurs between Areas D and E, just south of Daniels Avenue. Any activities conducted in this section such as excavation, filling or construction of a riprapped channel may require Section 10 permits from the U.S. Army Corps of Engineers. The Town should contact Mr. Jim Law of the Regulatory Branch at 1-800-343-4789.

B. Section 404 of the Clean Water Act regulates the discharge of dredged material or placement of fill into navigable waters, wetlands adjacent to navigable waters and tributaries to navigable waters. The tidal wetlands located between Area A and D are regulated 404 wetlands because they are wetlands located adjacent to navigable waters. The non-tidal areas of Noname Brook located upstream of Area D also represent regulated 404 wetlands since Noname Brook is a tributary to navigable waters. In general, the discharge of dredged material or placement of fill into a 404 wetland is a regulated activity for which federal permits are required. The Town should contact Mr. Jim Law as noted above. Also, when Section 404 permits are required, Section 401 permits (water quality certification) are also required. This certification process has been delegated to the State of Connecticut and is administered by the Water Resources Unit of DEP.

State Permit Programs

A. The Tidal Wetlands Act regulates activities within the boundaries of a designated tidal wetland. Niantic River Road represents the upstream boundary of tidal wetland according to the tidal wetland map for Noname Brook. However, the permit for the installation of the culvert under Niantic River Road shows a tidal wetland boundary that is positioned between Niantic River Road and Second Avenue. If the boundary line shown on this permit is the accepted tidal wtland boundary, then tidal wetland permits may be required for the channel excavation and the placement of riprap.

A sediment control basin is proposed to be constructed on the downstream side of Niantic River Road. This activity is located within a regulated tidal wetland boundary and may, therefore, require a permit. If it should be the case that this is the only activity requairing a tidal wetland permit, then the town might consider an alternate type of sediment control device that would not be placed within tidal wetland. For example, the use of a fabric filter fence placed across the channel and on the upstream side of Niantic River Road might serve to intercept sediment and preclude the need for tidal wetland permits.

Tidal wetland of fact located above the designated tidal wetland boundary is not regulated under the Tidal Wetland Act. Mr. Rick Huntley of the Water Resources Unit in DEP should be contacted (566-7160) to determine whether or not tidal wetland permits are required.

B. Under the structures and dredging provisions of state statute, lands at or below mean high water are regulated. The need for structures and dredging permits will depend upon the location of the mean high water line upstream of Niantic River Road. To determine whether structures and dredging permits are required for stream channelization, contact Mr. Rick Huntley as noted above.

C. A diversion permit may be required for this project. The town has applied and submitted an application for a diversion permit.

Municipal Permit Programs

A. Inland Wetlands. All of Noname Brook upstream of the designated tidal wetland boundary represents inland wetland and watercourses. Tidal wetland of fact that is not mapped and regulated under the Tidal Wetlands Act is generally subject to regulation under the Inland Wetlands Act. Within the municipal permit program, inland wetland jurisdiction embraces the section of tidal wetland of fact in Area D and part of C.

B. Coastal Site Plan Review. The Section 8-24 review including the companion coastal site plan review for road reconstruction of this area embraced only the placement of sewers and culverts. This review does not incorporate any consideration of the proposed alterations of Noname Brook between the roads and their culverts. For this reason, it is recommended that the town prepare a coastal site plan review for the channelization component of the Noname Brook project. This information is also required for federal and state permits where needed because permits can only be issued for projects that are consistent with Coastal Management. General information required for this review is contained in the Coastal Site Plan Review Section of this ERT report. For the purposes of this review, designated and undesignated tidal wetland are reviewed as tidal wetland. Therefore, the tidal wetland policies apply to the region from Area A to D. Upstream of this, the brook is considered freshwater wetlands and watercourse.

BLACK MAYONNAISE

North of Fourth Street, Noname Brook is principally an open and dry drainage swale. During the summer, the water table is at or below the soil surface. Area E to G are the principal freshwater wetland areas containing standing water during the summer. During the field inspection, no signs of Black Mayonnaise were detected in this region. Tidal wetland Areas A and B support healthy tidal wetland. At the time of the site inspection, there was little if no sign of Black Mayonnaise in the tidal creek in Area A. The creek bottom in Area B, however, contained an organic muck which was called Black Mayonnaise.

As noted earlier, nearly 50% of the wetland in Area D is "mudflat" composed of primarily decomposing organic matter (muck). At one time, this wetland peat may have been firm and stable, but presently it is unstable and unconsolidated. Since the majority of the Brook is healthy and shows no signs of Black Mayonnaise, it would appear that the most probable source of this material is wetland Area D. During periods of intense stormwater runoff, the unstable organic material in this wetland is probably scoured and put into suspension. This material is then transported seaward and some undoubtedly enters the Niantic River. The presence of this material in the tidal creek or the Niantic River is apparently evidence of an erosion and sedimentation process and not a water quality problem.

The elevated sills separating Area B from Area A which reduces tidal flushing and maintain a higher low tide level in B perhaps accounts for the accumulation of "black mayonnaise" or simply organic matter in Area B.

It is possible that Area D was a stagnant area before the new culvert was installed. When the hydrology of a tidal wetland is altered to cause ponding of water over the wetland, the peat frequently degrades and decomposes. However, if the ponding is eliminated, the soil usually becomes firm. The installation of the new culvert under Niantic River Road may have reduced or eliminated the ponding that had occurred previously. In time, the muck may become more stable, and the Mayonnaise problem will disappear. The plans for channel construction show an elevated sill in Area C. This sill, if it is in the channel, may be acting to pond water on the upstream side.

DRAINAGE IMPROVEMENTS

Stormwater runoff into Noname Brook routinely causes flooding problems. The Consulting Engineers studied the existing drainage system and found that it could not freely pass the 10 year storm event. This was a function of the small size of the existing culverts. In redesigning the drainage system, the 10 year storm was selected as the design storm. During the 50 year storm event, it has been claimed that the lower reaches of the Brook would be inundated by flood waters from the Niantic River as far inland as Seventh Avenue (see tidal hydrology comments below).

The sizes and inverts of the culverts as shown on the plans are the design necessary to pass the 10 year storm based upon existing hydrological characteristics of the basin and the elevations of the roads. To bring the grade of existing channels into conformity with the new inverts will require excavation in various sections of the Brook. For the most part, this excavation will reestablish the historic grade of the Brook although in places the course of the brook will be abandoned in places in favor of a straighter watercourse.

The source of the tidal hydrology information used in the above assessment is the FEMA report for Waterford prepared in 1980. In this report, the reference source of this tidal data was the 1974 Tiday Hydrology Report prepared by the U.S. Army Corps of Engineers. The reported 10 and 50 year flood level were 6.7' and 9.4' NGVD respectively. Technically, these elevations are for Long Island Sound adjacent to the Niantic River and not for the River proper or Noname Brook.

In 1980, the Corps of Engineers revised this report. The current 10 and 50 year tidal flood level for Long Island Sound adjacent to the Niantic River are 6.5' and 8.6' NGVD respectively. A flood level of 8.6' in the Niantic River sustained for several hours could flood across Fourth Avenue. Technically, the 50 year flood level for the Niantic River proper is invariably less than 8.6' because the tidal hydrology in Long Island Sound and the Niantic River are different. The inlet connecting Long Island Sound to the Niantic River is extremely narrow. The flood cycle in the Sound is more or less 6 hours in duration. When slack high tide is reached in Long Island Sound, the River is still flooding because the inlet is too narrow to not pass the full extent of the Sound's tide in 6 hours. There is almost always a lag in the height of water. Slack water in the inlet will probably occur one to two hours after high slack water in Long Island Sound. This means that the water levels in the River and Long Island Sound are equal only after the water levels in the Sound have dropped. This value is obviously less than the high tide level in the Sound. The reverse pattern is often true at low tide. Low tide in the Sound is usually lower than low tide in an embayment.

In a tidal river, the height of high tide usually decreases with increasing distance upstream. Thus, the high tide level in the Golden Spur section of the Niantic River is probably lower than the tide level in the southern portions of the River. Invariably, the tidal hydrology pattern in Noname Brook differs from the Niantic River. It is expected that the low tide datums in Noname Brook may differ from the River due to the presence of a sandbar.

The tidal hydrology and tidal flood elevations in Noname Brook are probably not the same as those in the Niantic River. In fact, the tidal hydrology upstream of each road and culvert may be different from the downstream side. Each road acts as a dam to overmarsh flows and culverts, depending upon their size, may also restrict tidal flows. There are also frictional losses to the tidal prism as it moves upriver. The tidal flood levels as shown on the plans would be uniform in elevation only if the reported flood waters in the Niantic River were sustained for a sufficiently long period of time to pass this flood level to upstream sections. In the absence of tidal hydrology information for the

Niantic River and Noname Brook, it is impossible to predict what the 10 and 50 year coastal flood elevations actually are.

It is also erroneous to assume that the duration of the ebb and flood cycles in a tidal embayment parallel the tidal cycle of Long Island Sound. It is often assumed that the ebb and flood cycles in coves are 6 hours each. In Pine Creek in Fairfield for example, the flood cycle is 3 hours long and the ebb cycle is 9 hours long. Evidently then, the engineering of structures such as culverts in a tidal location must be based upon the local tidal hydrology of the embayment, not Long Island Sound.

SHELLFISH CLOSURES

Shellfish closures for the Niantic River, as designated by the Connecticut Department of Health Services, are shown on the accompanying map. While the map refers to the area offshore the mouth of Noname Brook, as a "Proposed Closed Area," the area in fact is formally closed. This area is delimited by a straight line extending from the demarcation sign located at the end of Bishop Street northwesterly to the R"18" buoy, thence northeasterly to the demarcation sign at the end of Daniel Avenue. Sampling of seawater samples at the mouth of Noname Brook produced a median total coliform count per 100 ml of 2,000 which represents a 100 percent increase over the standard. However, in the offshore stations, the observed coliform counts were not above the standard. Attached to this report is a copy of the survey report prepared by the Connecticut Department of Health Services.

Sewering the Noname Brook environment should contribute to improved water quality near the mouth of Noname Brook. It is not likely that channelization of the Brook will improve or degrade water quality in this area.

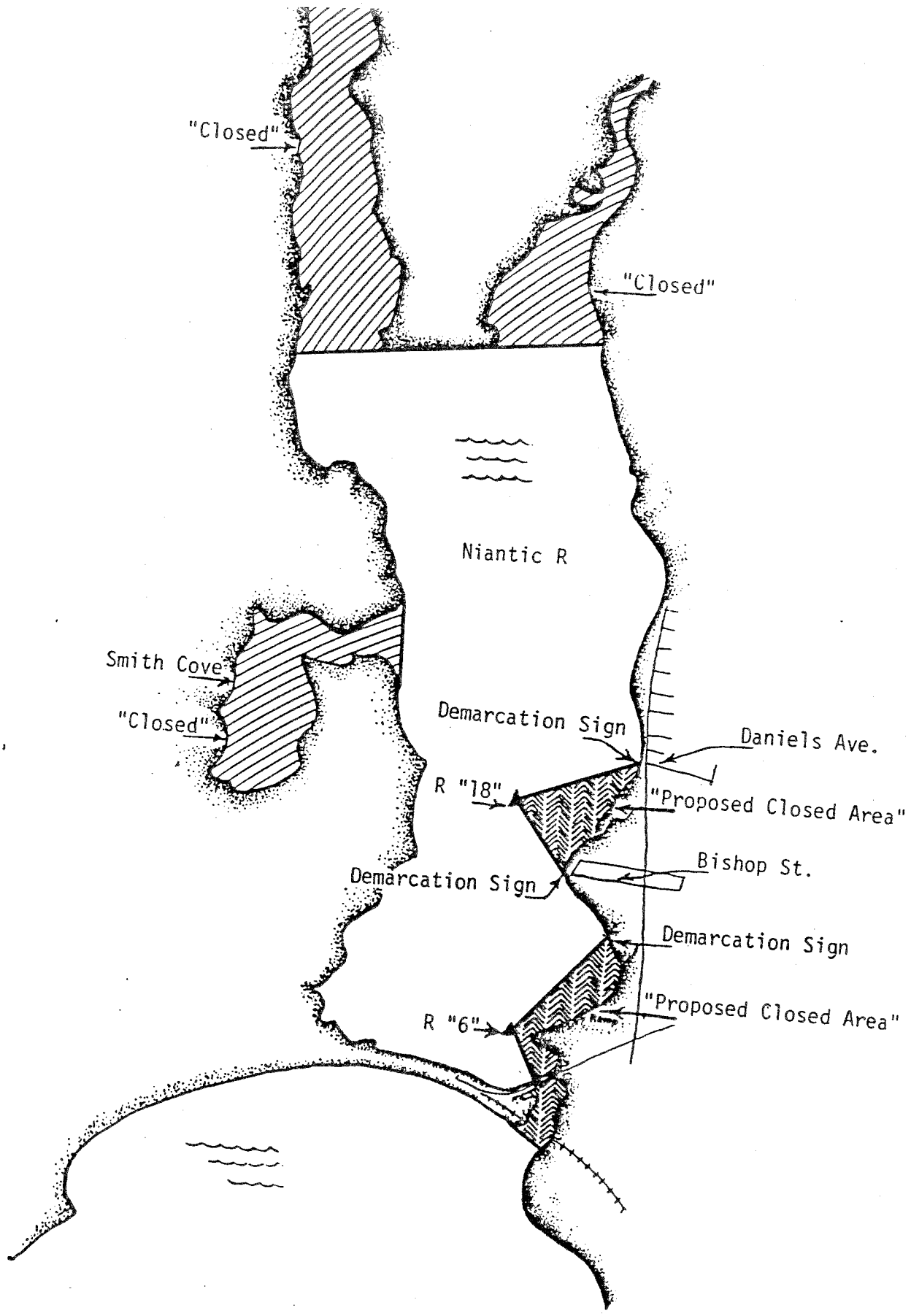
VISUAL BARRIERS

A concern that was expressed at the pre-review meeting was the desire to maintain or restore vegetation barriers such as the tall Reed colonies. Reed is very tolerant to disturbances and should re-establish itself so long as the root system is not disturbed. For example, trampling will not destroy Reed.

Where it becomes necessary to replant disturbed areas, there are several alternatives. One is to transplant the roots of Reed from nearby colonies into the disturbed areas. The one disadvantage to using Reed is that it is an aggressive weed in brackish tidal wetland. It may, therefore, displace the shorter meadow grasses. An alternative to Reed is the tall Gama Grass which also occurs along the tidal sections of Noname Brook. This is not a pestiferous plant and should be easy to transplant. Alternatively, there are a variety of ornamental grasses available through nurseries that grow nearly

EAST LYME - WATERFORD

CLOSED AND PROPOSED CLOSED SHELLFISHING AREAS - MAY 20, 1983



as tall as Reed and generally do not displace native wetland species. One attractive grass that could be used in dry to moist areas is Chinese Plume Grass (Miscanthus sinensis).

COASTAL MANAGEMENT

A coastal site plan review (CSPR) was completed in 1983 for road reconstruction in the Mago Point area. While this CSPR did include the installation of culverts under the roads that cross Noname Brook, it did not specifically address the channelization of the Brook. Therefore, a separate CSPR, or an amendment to the 1983 CSPR, must be completed for the channelization of Noname Brook. To assist this effort, the following information has been assembled.

Identification of Coastal Resources

On-site resources include coastal hazard (flood) area, freshwater wetlands and watercourses, and tidal wetlands. Resources located adjacent to the site and that could be affected by stream channelization include tidal wetlands, intertidal flats, coastal hazard area, shellfish concentration areas and coastal waters (estuarine embayments). As noted earlier, all tidal wetland of fact located between areas A and D are to be treated as tidal wetland for the purposes of the CSPR.

Identification of Coastal Policies

The identification of both the resources located on and adjacent to the site and the proposed uses determines the applicable policies which are (as identified in planning report 30) as follows:

Coastal Resource Policies

IA. General Resources - A,B, and C
IE. Intertidal Flats - A,C, and D
IF. Tidal Wetlands - A,B and D
IG. Freshwater Wetlands and Watercourses - A
IH. Coastal Hazard Area - A
IK. Shorelands - A
IL. Shellfish Concentration Areas - A
IM. Coastal Waters and Estuarine Embayments - A,C and D

Coastal Use Policies

IIA. General Development - A
IID. Coastal Structures and Filling A,E, and F
IIE. Dredging and Navigation - D and E

A brief analysis of the consistency of this project with certain policies is provided below:

A. Tidal Wetland Policies

The three areas of concern are direct impacts to tidal wetland in areas C and especially D, indirect impacts from scouring and indirect impacts from uncontrolled sedimentation.

The project proposal for area D includes excavation of a channel, lining the channel with riprap and placement of inorganic fill over the mucky peat. The CSPR application should contain an explanation of why filling is necessary. Filling may be consistent with the tidal wetland policies if it can be demonstrated that filling is necessary and that no alternatives exist. Also, if wetland restoration is possible in this area, the finished grades of the fill should be sufficiently low to allow for regular tidal flooding so that the site can continue to support wetland plants.

From a strictly engineering standpoint, it is not a good practice to place inorganic fill over unconsolidated organic muck. The weight of the fill will cause the organic muck to compact and possibly flow horizontally and vertically. As the peat settles, the surface of the fill will lose its engineered grade, muck may ooze upwards through the fill and horizontal movement might affect the integrity of the channel. If the muck is deep and the riprap placed over muck, the riprap will settle into peat. For this reason, soil borings should be conducted to determine the depth of peat. It may be necessary to excavate the organic material and backfill with inorganic fill before channel construction or establishing final grades.

If placement of fill to either side of the channel is necessary and if wetland restoration is possible, then the finished grades of the fill should be established at elevations between local spring high water and mean sea level. At this time, it is not possible to determine the feasibility of wetland restoration until the tidal information for area D is generated and the elevations of the top of the finished channel are known. This information needs to be generated prior to completion of the CSPR application and any necessary state or federal permit applications. The Office of Planning and Coordination/Coastal Management is available to assist the town in determining the feasibility of wetland restoration in this area.

The feasibility of marsh restoration can be determined by recording the level of high tide in area D and area C adjacent to the Niantic River Road culvert during a neap and spring tide. This simply requires the observation of the slack high tide level for these two events and relating these tidal levels to a known datum. This information should then be noted on the plans. Also, a few spot elevations should be established at several points on the mudflat and the adjacent zone of Reed. Slack high water occurs when the waters in the culvert under Niantic River Road and Second Avenue are slack. Slack high water in Noname Brook may occur up to two hours after predicted slack high water in the nearby Long Island Sound.

The movement of sediment generated by the construction activities into tidal wetlands in area A and B as well as the Niantic River should be controlled to the fullest extent possible. Sediment control basins are proposed to be constructed throughout Noname Brook. Indeed, this should help to reduce sedimentation. The control basins probably will not trap the finer textured sediments and prevent these from discharging into tidal wetlands and the Niantic River. Finer textured sediments should be intercepted by installing a fabric filter fence across the channel in area C. This may also preclude the need to construct a sediment control basin on the seaward side of Niantic River Road. This would require excavation of a basin in tidal wetland. Such construction should be avoided if at all possible and would require tidal wetland permits.

The proposed plan should be reviewed to determine if the new stormwater flow rates will cause scouring of tidal wetland in area A and B. If tidal wetland destruction will occur because of scouring then a mitigation technique should be incorporated into the design to eliminate or minimize this adverse impact.

B. Freshwater Wetlands and Watercourses

As a rule, it is preferable to avoid activities in freshwater wetlands unless no alternatives exist. In this case, the need exists to clean (excavate) the old channel and in some instances change the channel location. Furthermore, the need exists to line this channel with riprap because the resulting flow velocities would cause uncontrollable scouring of the channel.

When determining the acceptability of any adverse impacts, factors for consideration are wetland type and quality. For the most part, Noname Brook is a swale that lacks standing water in the summer and supports emergent freshwater wetland plants. The swale areas are small and the quality of the wetland is low. Between areas D and G, the wetland supports shrub thickets and emergent wetland and contains shallow water in the brook proper. The wetland type is of low quality and the area to be affected is also small.

The project is generally consistent with the freshwater wetlands and watercourses policy. The impacts resulting from channel construction can be offset by upgrading the wetland habitat located adjacent to the channel following construction.

C. Estuarine Embayments and Shellfish Concentration Areas

The principal concern here is that sedimentation be controlled during construction to prevent sediment from moving into area A, area B and the adjacent Niantic River. Uncontrolled sedimentation is a short term impact that could affect both water quality and shellfish habitat.

Adverse Impact Considerations

The following is a listing of the potential adverse impacts as defined in section ssa-93(15) of the Connecticut Coastal Management Act (CCMA) that may be generated by this project:

- Degrading water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, pH dissolved oxygen or salinity.
- Degrading existing circulation patterns of coastal waters through the significant alteration of patterns of tidal exchange or flushing rates, freshwater input, or existing basin characteristics and channel contour.
- Degrading natural or existing drainage patterns through the significant alteration of groundwater flow and recharge and volume of runoff.
- Degrading or destroying essential wildlife, finfish or shellfish habitat through significant alteration of the composition, migration patterns, distribution, breeding, or other population characteristics of the natural species or significant alterations of the natural components of the habitat.
- Degrading tidal wetlands, beaches and dunes, rocky shorefronts, and bluffs and escarpments through significant alteration of their natural characteristics or function.

The potential adverse impacts of most concern include impacts to tidal wetlands, coastal waters and shellfish concentration areas. These considerations have already been discussed under the coastal policies. Incorporating appropriate sedimentation controls, designing the project to prevent scouring of tidal wetland and incorporating wetland restoration in area D if feasible would offset wetland impacts in that area.

CONCLUSIONS

Overall, the channelization of Noname Brook does not generate significant adverse impacts to coastal resources. Incorporation of all necessary sediment and erosion control techniques will minimize adverse impacts and make the project more consistent with the CCMA. As feasible, wetland restoration should be incorporated into the design for area D if the tide study indicates that restoration is possible. Preservation and enhancement of freshwater wetland in areas E to G should also be incorporated as feasible. If these considerations are incorporated into the design of the project, then it would appear that the project will be consistent with the CCMA.

Appendix

APPENDIX 1

LITERATURE CITED

MARINE FISHERIES CONCERNS

Anderson-Nichols & Co. 1981. Connecticut embayment study, phase I. Report prepared for State of Connecticut, Department of Environmental Protection, 6-14 - 6-26.

Babinchak, J. A., J. T. Graikoski, S. Dudley and M. F. Nitkowski. 1977. Distribution of Faecal Coliforms in Bottom Sediments from the New York Bight.

Clark, John R. 1977. Coastal Ecosystem Management. John Wiley and Sons, Inc. New York, New York.

NUSCo (Northeast Utilities Service Company) 1985. Monitoring the marine environment of Long Island Sound at Millstone Nuclear Power Station, Waterford, Connecticut. Annual Report, 1984.

STATE OF CONNECTICUT

DEPARTMENT OF HEALTH SERVICES

BUREAU OF HEALTH PROMOTION & DISEASE PREVENTION

PUBLIC NOTICE

In accordance with Section 19a-98 of the General Statutes of the State of Connecticut, the State Department of Health Services, as a result of examinations has determined that the shores, coastal waters and flats of certain areas of the Niantic River, Waterford and East Lyme do not meet acceptable standards of purity for the taking of shellfish (oysters, clams and mussels) and that shellfish obtained from these areas may be unfit for food and dangerous to the public health. Effective immediately, no person may take oysters, clams, or mussels from the following described shellfish closure areas:

1. That area enclosed by a straight line extending from the demarcation sign located at the end of Bishop St., Waterford, northwesterly to the R"18" bouy, thence northeasterly to the demarcation sign at the end of Daniel Ave., Waterford.

2. That area enclosed by a straight line extending from the southeast corner of the Niantic River railroad bridge , Waterford, westerly to the southwest corner of the railroad bridge, thence northerly along the mainland, East Lyme, to the northwest corner of the Rte. 156 swing bridge, extending northerly to the R "6" bouy, thence northeasterly to the demarcation sign on the mainland, Waterford.

These shellfish closure descriptions do not change other shellfish closures already in effect. A copy of the statutes concerning the sanitary control of shellfish is available.

Dennis F. Kerrigan, ~~Dep. Commissioner~~

DFK/MCS/dlg/z2
pg.3

Phone: 566-2279
79 Elm Street • Hartford, Connecticut 06106

SUBJECT: WATERFORD, CONN.; SEAWATER SAMPLING OF THE NIANTIC RIVER IN THE MAGO POINT AREA FROM MARCH 9, 1981 TO OCTOBER 27, 1982

To: Malcolm C. Shute, Principal Sanitarian
Food Protection Program
Preventable Diseases Division

From: James Citak, Senior Sanitarian
Food Protection Program
Preventable Diseases Division

Seawater samples were collected from fifteen sampling stations in the Niantic River in the vicinity of the Mago Point area. The purpose of these sampling stations was to determine the extent of bacteria contamination of the Niantic River open shellfish growing area caused by failing or marginal septic systems located in the Mago Point area along the eastern shore of the Niantic River. Known and potential pollution sources have been identified in a sanitary survey report conducted by the writer on April 14, 1982.

Water samples were collected from the mouth of two tributaries to the Niantic River, one hundred feet from the mouth of these tributaries, and Mago Point. A map indicating locations of sampling stations is attached to this report. Median bacteriological results, expressed as most probable number of coliform organisms per 100 ml of water, from these stations are as follows:

Sample stations at mouth of streams with known or potential pollution sources:

Station #	Median Total Coliforms/100ml	%Total Coliforms Over 230/100ml	Number of Samples
11A3	2400	80%	10
11G1	2,000	100%	4

Sample stations 100 ft. from stations #11A3, 11G1 or Mago Point:

Station #	Median Total Coliforms/100ml	%Total Coliforms Over 230/100ml	Number of Samples
11G	540	67%	3
11A3B	22	33%	6
11H	7.3	10%	10

Sampling stations 300 ft. from stations 11A3, 11G1 or Mago Point:

Station #	Median Total Coliforms/100ml	%Total Coliforms Over 230/100ml	Number of Samples
11G3	2.0	0%	3
11G4	7.8	0%	9
11G2	2	0%	3
11A	7.8	0%	9
11A6	11	0%	3
11A5	4.5	0%	6
11A7	4	0%	3
11A8	4.5	0%	3
11H2	2	0%	3
11	15	0%	8

Conclusions and Recommendations:

Water quality data does not conform to the Connecticut Public Health Code requirements for an open shellfishing area at sampling stations located within one hundred feet from the discharge point of a storm drain pipe on Forth Street, and 100 ft. from the mouth of a stream at the end of Beach Street. Samples collected three hundred feet from these non-point pollution sources do conform with the Connecticut Public Health Code requirements for a shellfish growing area. Water quality at station #11H located at Mago Point conforms with the Connecticut Public Health Code requirements, however, several restaurants in this area have marginal septic systems which periodically discharge sewage. Several large charter fishing boats are moored in this area which would also be potential pollution sources.

Those areas located within three hundred feet from station numbers 11A3, 11G1 and the shoreline from the state boat launching area south to the railroad bridge should be closed to shellfishing.

JC/bh(5V)


Niantic River
Stations 1982.
NIANTIC RIVER
The controlling depths were 8 feet for a width of 100-50 feet from the channel entrance (41°19'10"N., 72°10'54"W.) to the highway swing bridge, thence 6 feet for a width of 100 feet to Daybeacon 30
Aug 1970
SWING BRIDGE
HOR CL WEST DRAW 65 FT
VERT CL 9 FT
BASCULE BRIDGE
HOR CL 45 FT
VERT. CL 11 FT.
NIANTIC
N I A N T I C
B A Y
OSWEGATCHIE HILL
RIVER
Bandy Point
Keeny Cove
Smith Cove
Pine Grove
Clark Pond
Dodge Pond
McCook Pt
Wigwam Rk
Waterford I
Black Rk
Bay Pt.
Millstone
Durfy Hill
Graniteville
MAGNETIC
11A1
11A7
11A8
11H1
11H
11
11A
11A3
11ABR
11A5
11A6
11G
11G1
11G2
11G3
11G4
11B
11C
11D
11E
11F
1S
3S
4S
5S

About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area--an 86 town area.

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.