

OLD COLONY BEACH



**Wastewater Management
Study**

Final Public Hearing

November 19, 2011

Agenda

- **Present an Overview of the Study**
- **Summarize Findings**
- **Discuss Alternatives**
- **Review Estimated Costs**
- **Discuss Next Steps**
- **Answer Questions/Receive Comments**

Today's Public Hearing

The purpose of this public hearing is to report on the findings and recommendations of the study and to receive comments from the residents of Old Colony Beach Club Association.

NO VOTE WILL BE TAKEN AT TODAY'S MEETING. A vote will likely occur at the Association's 2012 June meeting.

Purpose of the Study

- **Evaluate existing conditions within Old Colony Beach Club Association**
- **Evaluate the ability of properties to continue to rely on on-site systems as a reliable, long-term means of wastewater disposal.**
- **Evaluate alternatives for long-range wastewater management**
- **Recommend the most technically feasible, cost effective solution**

Existing Conditions

- **Average lot size = 0.12 acres (5,227 S.F.)**
- **199 cottages, 18 condominiums, 1 boarding house, 1 synagogue**
- **20 vacant lots**
- **73 wells (not all in use)**
- **80 cesspools**
- **Groundwater is classified as GA by the Department of Energy and Environmental Protection (DEEP).**

Existing Conditions

- **Soils are sandy loam and are very porous.**
- **Shallow groundwater throughout the neighborhood. Groundwater depth ranges from roughly 2' – 4' deep.**
- **Public water is available through the Connecticut Water Company. Water is available on a year round basis to eligible properties.**

Field Work

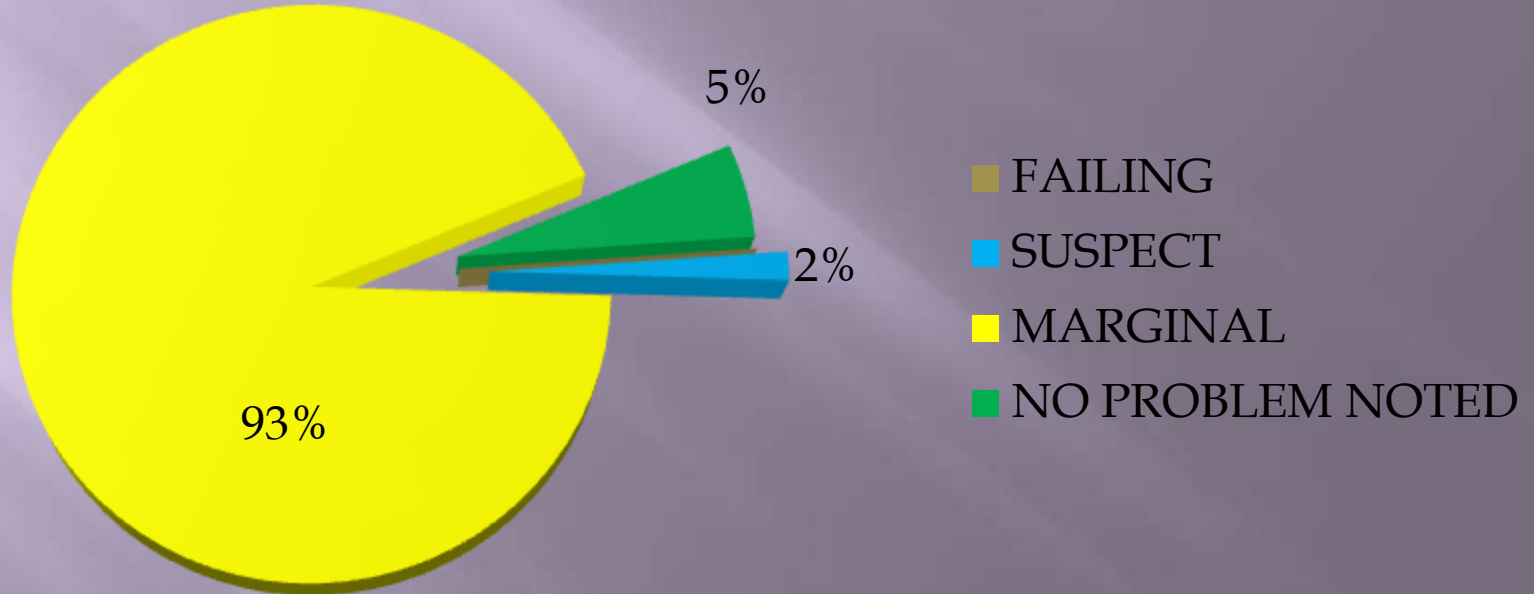
Soil Testing

- **4 test borings were advanced throughout the beach association using a hand auger.**
- **Borings were advanced up to a depth of 4 feet (within the zone of disposal systems).**
- **Groundwater was encountered between 22” and 44” deep (groundwater gets shallower as you go southeast and towards the brook).**
- **Soils were uniform across the study area and are a coarse sand and gravel. Soils are very porous and transmit water easily.**

Sanitary Survey Results

- **84% of properties have only a small area available for wastewater disposal**
- **43% of properties have cesspools**
- **44% of properties were noted as having shallow groundwater**
- **40% of properties have wells (not all are in use)**
- **Average lot size is 0.12 acres (5,200 sq. ft.)**
- ***Significantly* high density of development**

Sanitary Survey Results





Water Quality Sampling

- **A total of 13 samples were collected:**
 - 4 wells
 - 3 surface water (stream)
 - 5 catch basins
 - 1 sump pump discharge

- **Samples were analyzed for:**
 - Bacteria
 - Ammonia/Total Nitrogen
 - Nitrate/Nitrite



-  STUDY LIMITS
-  WATER SAMPLE

RFP Engineering, LLC
188 North Main Street
Southington, CT 06489
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WATER QUALITY SAMPLING



The Old Colony Beach Club Association
P.O. Box 10 Old Lyme, CT



Date:	7/6/11
Scale:	1" = 300'
Drawn By:	RFP
Checked By:	RFP
Project No.:	2011.01

4.8.1

FIGURE NO.



-  NITROGEN CONTAMINATION
-  COLIFORM CONTAMINATION

-  STUDY LIMITS
-  WATER SAMPLE

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FIGURE NO.

Water Quality Sampling

- **All but 1 sample exhibited levels of bacteria above CT DPH drinking water standards**
 - **Total Coliform Bacteria ranged from <10 to >2000**
 - **E. coli Bacteria ranged from <10 to >1000**
 - **Allowable levels per DPH are 0 for both**
- **Most samples showed detectable concentrations of Nitrogen, possibly from partially treated sewage**

Modeling

Nitrogen Attenuation Analysis

- Nitrogen is a primary nutrient found in domestic wastewater. It is not treated by septic systems or cesspools; consequently, effluent must be diluted by rainfall in order to achieve the maximum allowable concentration of 10 mg/l before the effluent reaches the property line.
- Given Connecticut's average annual rainfall, the minimum area needed to meet this standard is 0.24 acres. 92% of the properties in Old Colony Beach do not meet this standard.

Nitrogen Attenuation Analysis

- **Because of the density of development, the community as a whole produces a concentration of 14.1 mg/l of nitrogen in the local groundwater. This nitrogen ultimately flows into Long Island Sound and contributes to the hypoxia that is presently occurring in portions of the Sound.**

Pathogen Destruction

- **A properly designed and functioning subsurface disposal system will ensure that all pathogens will be destroyed before they leave the property or enter a potable water supply well.**
- **Pathogens are presumed to have died off 21 days after they are discharged to the groundwater. This means that septic system effluent must remain on-site for a minimum of 21 days.**

Pathogen Destruction

- Meeting this criterion depends on the porosity of the soils and the slope of the land.
- Given conditions within Old Colony Beach, a property must be a minimum of 0.25 acres to meet this requirement. 93% of properties in Old Colony Beach do not meet this standard.
- Making matters worse, many wells are situated too close to disposal fields to ensure that all pathogens have been destroyed.

Conclusions

- **The density of development is extremely high. Lots are generally small with little area available for sewage disposal. The ability to repair systems is extremely limited and in some cases non-existent. Limited space also inhibits the use of “alternative” treatment systems.**
- **Soils are generally porous and can transmit high volumes of water. Soils don't appear to restrict subsurface sewage disposal. As a result, large quantities of sewage are able to be discharged to the ground, which can mask the presence of a problem.**

Conclusions

- **Groundwater is shallow over a significant portion of the neighborhood. Many systems are likely to have been installed in or slightly above groundwater resulting in incomplete sewage treatment.**

Conclusions

- **Groundwater is shallow over a significant portion of the neighborhood. Many systems are likely to have been installed in or slightly above groundwater resulting in incomplete sewage treatment.**
- **There is evidence of bacteriological contamination throughout the neighborhood indicating incomplete sewage treatment.**
People relying on an on-site well for drinking water should have their water tested regularly.

Conclusions

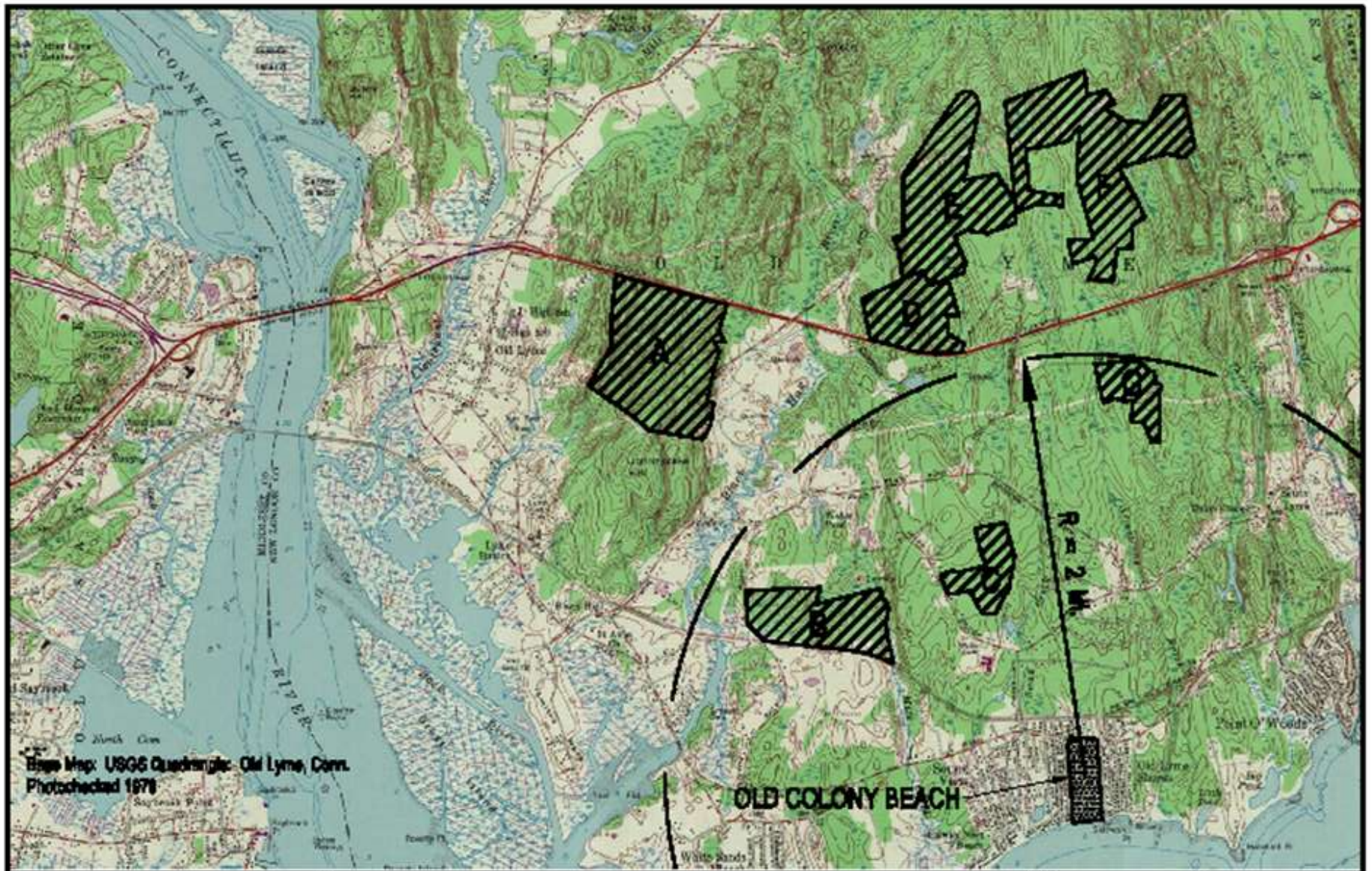
- **Groundwater will continue to be degraded as existing disposal systems reach their effective life spans.**
- **Continued reliance on on-site wastewater treatment is not considered to be a long-range, viable alternative for the community; off-site treatment and disposal will be required.**

Alternatives

- **Community treatment system on Buttonball Road**
- **Sanitary sewer to Point O'Woods' sewer system**
- **Sanitary sewer to East Lyme's sewer system**

Community Treatment Site Screening

- **Search was made for potential sites within a 2-mile radius of Old Colony Beach**
 - **Candidate lots must be large enough to accommodate maximum (future) wastewater flow (minimum lot size = 55 ac.)**
 - **Candidate lots must have suitable soils for subsurface wastewater disposal per published mapping**
 - **No site testing was conducted**
- **Only one site was identified that meets criteria. Site is on Buttonball Road.**



Base Map: USGS Quadrangle - Old Lyme, Conn.
 Photorevised 1978

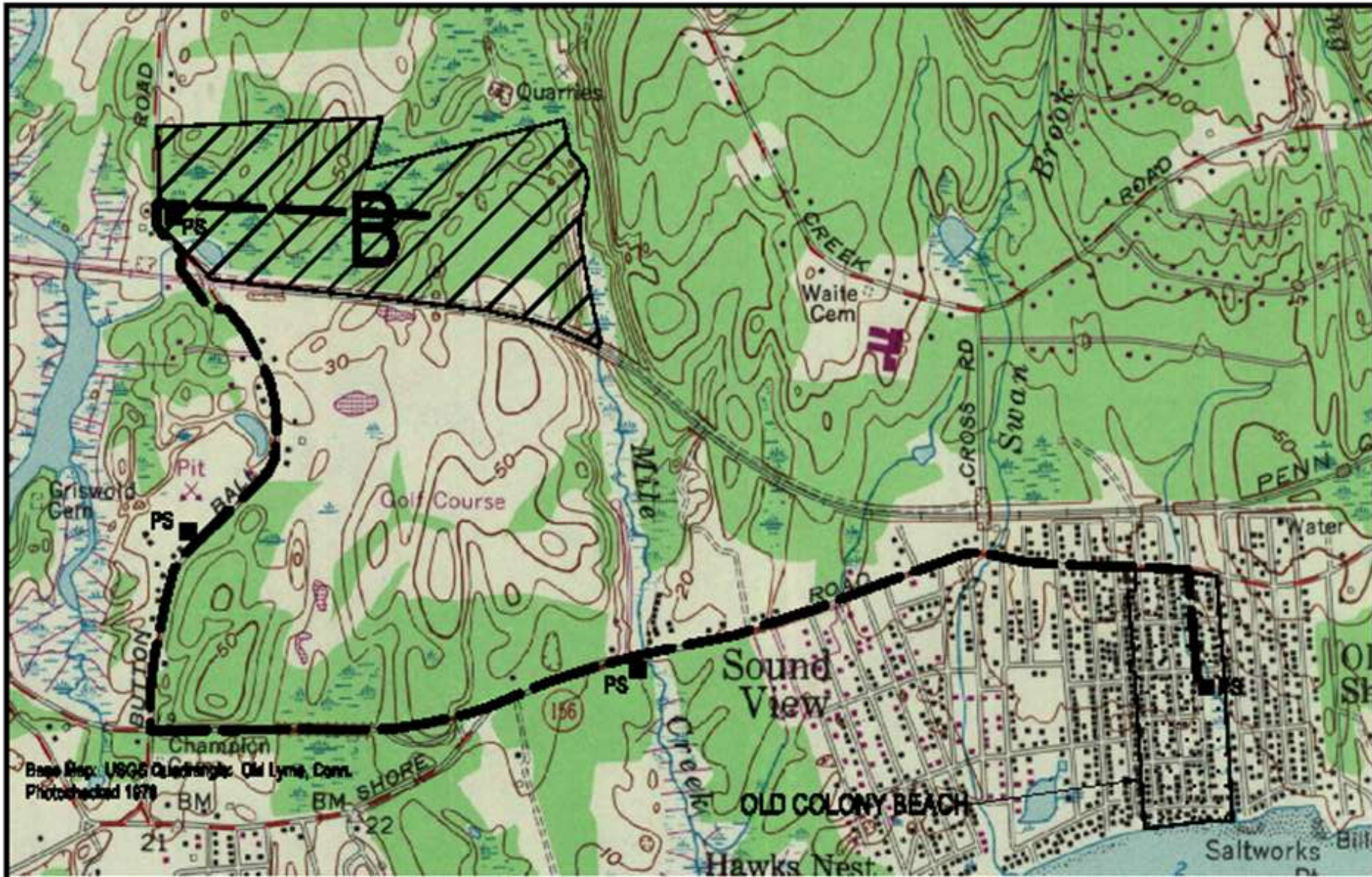
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POTENTIAL COMMUNITY TREATMENT SITES

The Old Colony Beach Club Association
 P.O. Box 10 Old Lyme, CT

DATE	07/12/11
SCALE	1" = 2,000'
PROJECT	RFP
CLIENT	RFP
DATE	09/11/11

X
 PLATE NO.



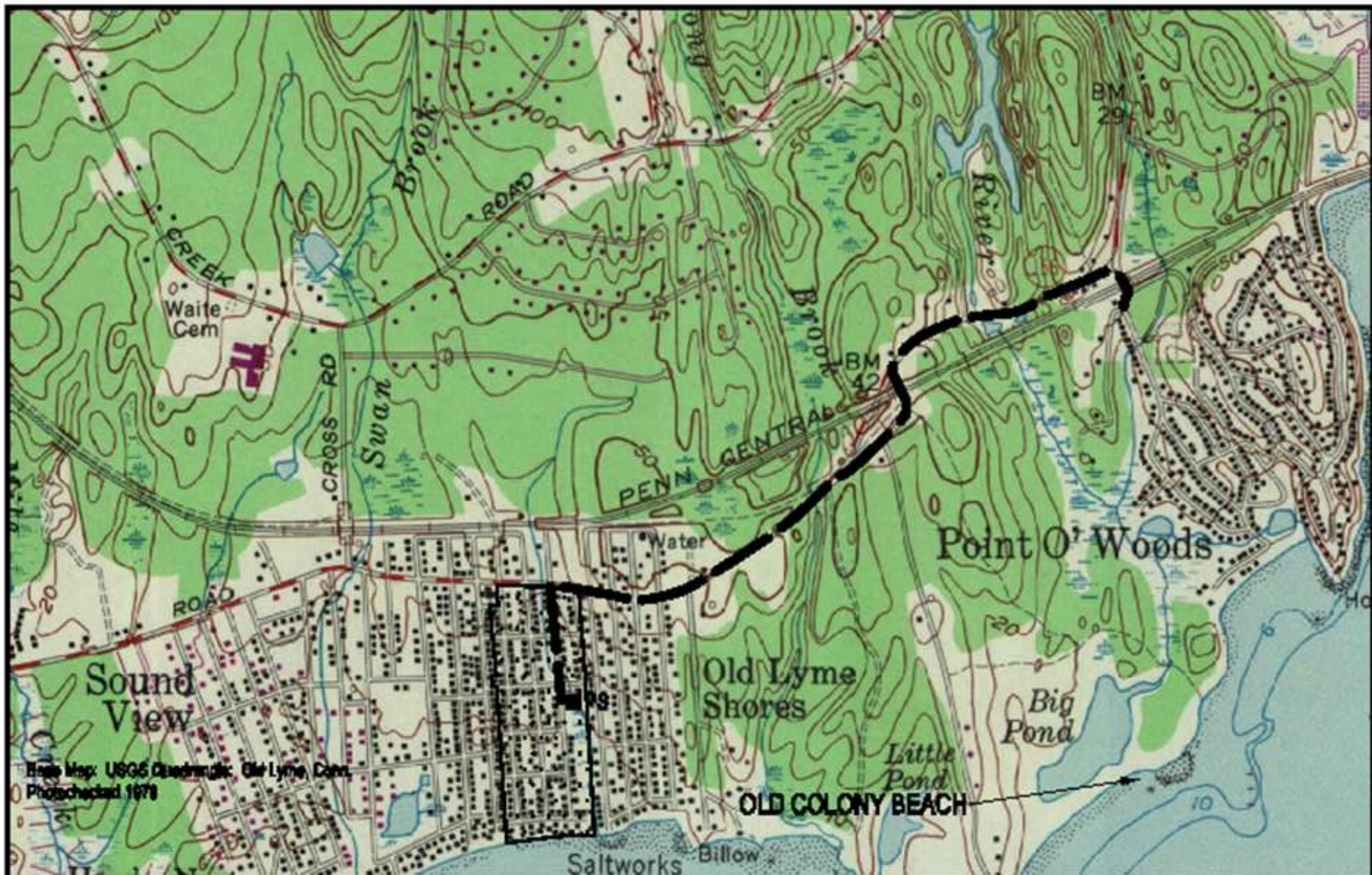
Base Map: USGS Quadrangle, Old Lyme, Conn.
 Photochecked 1978

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 100 North Main Street
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**BUTTONBALL ROAD
 COMMUNITY SYSTEM SITE**
 The Old Colony Beach Club Association
 P.O. Box 10 Old Lyme, CT

Date	07/12/11
Scale	1" = 1,000'
Client	RFP
Contract No.	RFP
Project No.	2011.01

X
 PLATE NO.



Base Map: USGS Quadrangle: Old Lyme Conn.
 Photorevised 1979

RFP Engineering, LLC
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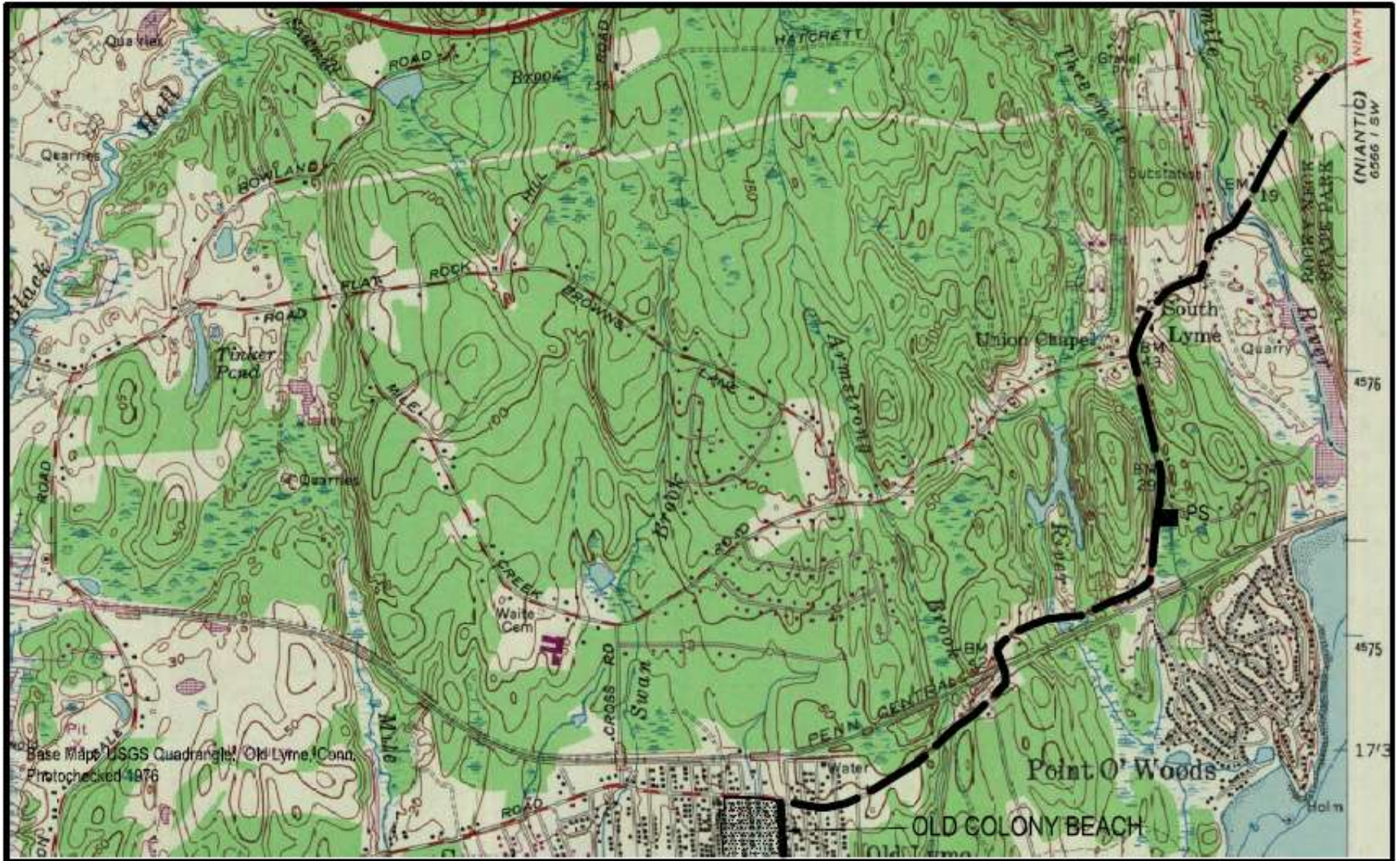
**SEWER ALTERNATIVE 1:
 DISCHARGE TO POINT O' WOODS**

The Old Colony Beach Club Association
 P.O. Box 10 Old Lyme, CT

Date	07/12/11
Scale	1" = 1,000'
Drawn By	RFP
Checked By	RFP
Project No.	2011.01



PLATE NO.



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SEWER ALTERNATIVE 1: DISCHARGE TO EAST LYME SEWER

The Old Colony Beach Club Association
 P.O. Box 10 Old Lyme, CT

Date:	07/12/11
Scale:	1" = 1,500'
Drawn By:	RFP
Checked By:	RFP
Project No.:	2011_01

5.2.4.2

FIGURE NO.

Comparison of Alternatives

Community Treatment

PROS

- Eliminates the need for individual on-site treatment systems.
- Places OCBCA in control of entire operation and maintenance of all wastewater conveyance, treatment, and disposal facilities.
- Does not require intermunicipal agreements

CONS

- Further site testing needed to confirm the viability of the site.
- Site acquisition costs likely to be high. Pump station sites may not be able to be acquired due to lack of eminent domain powers.
- Significant local permitting/approvals required.

Community Treatment

PROS

CONS

- Will require Old Lyme zoning commission approval.
- Site development costs are high due to lack of access and other site constraints.
- Residents may object to the location/presence of a treatment plan.
- Full time staff will be required for O&M of treatment system.

Community Treatment

PROS

CONS

- If constructed, the treatment system will be among the largest in the state. Difficulty/delays in obtaining a DEEP permit can be anticipated.
- Extensive odor control will be required due to the length of force main required.

Sewer to Point O'Woods

PROS

CONS

- **Need for treatment facility is eliminated.**
- **Does not require the purchase of private property for pump stations.**
- **Permitting requirements are minimized.**
- **Pipelines could be constructed off of town-owned roads.**

Sewer to Point O'Woods

PROS

CONS

- O&M requirements are minimized.
- Requires least amount of construction; length of time for construction would be least.

Sewer to Point O'Woods

PROS

CONS

- Requires negotiating separate agreements with East Lyme and Point O'Woods. This will likely require extensive time and expense.
- Old Colony will be expected to participate in the cost of any future improvements to shared facilities in POW, East Lyme, Waterford, and/or New London.

Sewer to East Lyme

PROS

- **Need for treatment facility is eliminated.**
- **Permitting requirements are moderate.**
- **Pipelines could be constructed entirely within ConnDOT rights-of-ways.**
- **Eliminates the need for a separate agreement with Point O'Woods.**

CONS

- **Requires negotiating an agreement with East Lyme. This could require extensive time at potentially significant cost.**
- **Requires the acquisition of private property for construction of a pump station.**

Sewer to East Lyme

PROS

CONS

- **Old Colony will be expected to participate in the cost of any future improvements to shared facilities in East Lyme, Waterford, and/or New London.**

TABLE 5.4.1
PRELIMINARY OPINION OF CAPITAL COSTS FOR
TECHNICALLY FEASIBLE ALTERNATIVES
OLD COLONY BEACH CLUB ASSOCIATION
OLD LYME, CT
OCTOBER, 2011

Alternative	Capital Cost ⁽¹⁾	DEP Grants	Net Cost	No. of EDU's Served ⁽²⁾	Net Cost Per EDU	Annual Cost Per EDU ⁽³⁾
1. Community Treatment System at Buttonball Road Site	\$10,700,000	\$2,500,000	\$8,200,000	217	\$37,788	\$2,300
2. Connection to Point O'Woods Sewer System	\$5,700,000	\$1,300,000	\$4,400,000	217	\$20,276	\$1,235
3. Connection to East Lyme Sewer System	\$6,200,000	\$1,400,000	\$4,800,000	217	\$22,120	\$1,347

NOTES:

1. All Costs are rounded and are in 2011 Dollars. Costs for comparison purposes only.
2. EDU = Equivalent Dwelling Unit
3. Annual Net Cost Per EDU at 2% Interest for 20 Years

Estimated Cost of Recommended Plan

<u>Expense</u>	<u>January 2016 Costs</u>
Construction Cost	\$4,257,461
15% Contingency	638,619
Technical Services	851,492
Legal & Administrative	212,873
Short Term Interest	364,827
Tech. Services During Negotiations	27,602
Legal & Admin During Negotiations	<u>55,204</u>
TOTAL DESIGN AND CONSTRUCT.	\$6,408,078
DEEP Grant	<u>(\$1,370,902)</u>
Estimated Net Local Share	\$5,037,176
Number of EDU Served	217
Net Cost per EDU	\$23,213
Annual Cost Per EDU	\$1,442

Estimated Sewer Use Fee

<u>ITEM</u>	<u>ANNUAL COST⁽¹⁾</u>
Existing POW User Fee	\$200
Additional User Fee	\$111
Total Annual Cost Per EDU	\$311

1. All costs in 2011 dollars.

PROJECT IMPLEMENTATION

1. **Board of Governors conducts a Public Hearing to solicit comments on the draft wastewater management plan.**
2. **RFP Engineering finalizes the wastewater management plan and issues a final report.**
3. **Board of Governors retains the services of bond counsel to assist with the preparation of a motion(s) to be voted on by the association authorizing the funding of the project.**
4. **Association adopts recommendations of the plan and votes to authorize funds for design and construction of the project.**
5. **Board of Governors authorizes the formation of a Water Pollution Control Authority.**
6. **WPCA retains the service of general legal counsel to assist with negotiations of intermunicipal agreements.**
7. **WPCA forms a subcommittee to meet with DEEP and Old Lyme Shores to discuss consolidation of the two projects.**
8. **OCBCA and Old Lyme Shores engage an engineer to evaluate the impacts of a combined project.**
9. **Negotiate agreements with Town of East Lyme and Point O'Woods for capacity and use of facilities.**
10. **Select and negotiate an agreement with a qualified engineering firm for design of the project**
11. **Apply to the DEEP for Clean Water Funds for design of the project**
12. **Execute a design agreement with engineering firm**
13. **Design system**
14. **Obtain permits from local, state and federal agencies**

PROJECT IMPLEMENTATION

15. Obtain local zoning commission approval of the project
16. Solicit bids from contractors
17. Apply to the DEEP for funds for construction of the project
18. Execute agreement with lowest qualified bidder
19. Construct project
20. Develop a sewer use ordinance and connection policy
21. Develop and adopt benefit assessment policy
22. Develop and adopt user fee system
23. Enter into an agreement with a qualified firm for system operation and maintenance
24. Allow users to connect
25. Implement user fee system and collect charges from customers
26. Levy benefit assessments on properties and collect assessments
27. Begin repayment of CWF loan funds

