**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP

**2022**

**COMMUNITY PRESERVATION FUND (CPF)**

## WATER QUALITY IMPROVEMENT PROGRAM


# Application for Southampton Town CPF WQIP Grant
# For Quogue Wildlife Refuge
# Quogue, NY

**By**
**New York Center for Clean Water Technology**
**4/15/22**

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP

**2022**

## COMMUNITY PRESERVATION FUND (CPF)
# WATER QUALITY IMPROVEMENT PROGRAM
## PROPOSAL SUMMARY

Project Applicant: **Quogue Wildlife Refuge**
Project Title: **Quogue Wildlife Refuge Constructed Wetland**
Project Manager Name: **New York State Center for Clean Water Technology ("CCWT")**

| | |
|---|---|
| Name | Frank Russo, PE |
| Title | Associate Director |
| Organization | New York State Center for Clean Water Technology at Stony Brook University ("CCWT") |
| Address | 1000 Innovation Rd, Suite 100, Stony Brook, NY 11794-6044 |
| Phone | 631-252-3797 |
| Email | frank.russo.3@stonybrook.edu |

Property owner (if different from Project manager organization):

| | |
|---|---|
| Name | Michael Nelson |
| Affiliation | Quogue Wildlife Refuge |
| Organization | Southampton Town Wildfowl Association (STWA), a 501 (c)(3) |
| Address | 3 Old Country Rd |
| Phone | 631-653-4771 |
| Email | michael@quoguewildliferefuge.org |

Project Address: 3 Old Country Rd, Quogue, NY 11959 SCTM #(S) 900-313-1-1.1

Type of Project (Check all that apply):
☑ Reduction ☐ Remediation ☐ Restoration

**PROJET SUMMARY**: (Provide a brief narrative description of proposed WQIPP project)

Quogue Wildlife Refuge seeks funding to replace three existing septic systems with a single innovative and alternative onsite wastewater treatment system (I/A OWTS). The new system would be a relatively novel I/A OWTS for the Town of Southampton, specifically a Constructed Wetland septic system. This project will be facilitated by the New York Center for Clean Water Technology at Stony Brook University ("NYS CCWT"), with engineering advisory services from Roux Environmental Engineering and Geology, DPC ("Roux"), an independent professional engineering firm with leading experience in designing Constructed Wetlands. This technology uses natural nitrogen cycles in a largely passive configuration to reduce nitrogen from onsite wastewater to levels consistent with the most effective commercial technologies. Subject property is owned by Southampton Town Wildfowl Association (STWA), a 501 (c)(3), dba Quogue Wildlife Refuge. The existing system lies within 100 yards of Old Ice Pond which drains into highly impaired water bodies, Quantuck Creek and then into Quantuck Bay. Given the thousands of Town residents who visit the Refuge annually, this project stands to serve as an excellent public demonstration project for CPF.

1. **PROJECT TYPE** (check all that apply)

Must meet at least one of the definitions of "Water Quality Improvement Project" per State Law Chapter 551 cited above. Check all that apply. **Note: Monitoring costs are only potentially eligible for CPF funding within Aquatic habitat restoration projects.**

- ☐ Wastewater Treatment Improvement Project
- ☑ Non-point source abatement and control
- ☐ Aquatic habitat restoration
- ☐ Pollution prevention
- ☐ Operation of Peconic Bay National Estuary Program (Grant Match)

2. **PRIORITY AREA(S)** (check all that apply)

Priority areas are defined in the Water Quality Improvement Project Plan (WQIPP).

- ☑ 303(d) Impaired
- ☐ Peconic Estuary Program - PEP map
- ☑ High
- ☐ Medium
- ☐ Outside High and Medium priority areas*

*If Outside High and Medium priority areas, explain how the project is relevant to WQIPP goals.

The existing system being replaced has three separate septic systems, all within 100 yards of Old Ice Pond which drains into Quantuck Creek and then into Quantuck Bay, both 303(d) Impaired Waterbodies.

3. **PROJECT DESCRIPTION**

3a. Existing conditions of applicable groundwater/sub-watershed/waterbody and most recent and relevant data available (provide sources).

Located in a High Priority Area, 303 (d) Impaired
Quantuck Bay has been declared impaired by the New York State Department of Environmental Conservation (NYSDEC). For more than 35 years, these waters have been plagued by recurrent brown tides more frequently than any other water body across Long Island leading to significant losses of shellfish and eelgrass. As the epicenter of brown tides that subsequently spread east into Shinnecock Bay and west into Moriches Bay, Quantuck bay has an outsized influence on the ecological health of the Town of Southampton waters. High levels of nitrogen have been detected in the groundwater around Quantuck Bay that subsequently flows to coastal water bodies, promoting these brown tides while also contributing toward other nitrogen-related impairments including the loss of salt marshes, the loss of eelgrass, poor water clarity, low oxygen levels, and poor conditions for fish populations. According to Suffolk County's Subwatersheds study, the nitrogen from residential wastewater represents the large majority of the total load to Quantuck Bay.

3b. How the proposed solution addresses the issue in the context of Reduction, Remediation and/or Restoration as per the CPF Water Quality Project Plan. Note all remediation and restoration projects must assure that reduction measures are also addressed.

Constructed Wetlands (CW's) have demonstrated the capacity to remove > 80% of nitrogen (N) from most residential wastewater influent. Using median values of 60 mg- nitrogen (N)/L in septic tank effluent (Suffolk County Subwatersheds Study, 2020) and an estimated average daily generation of 100 gallons of

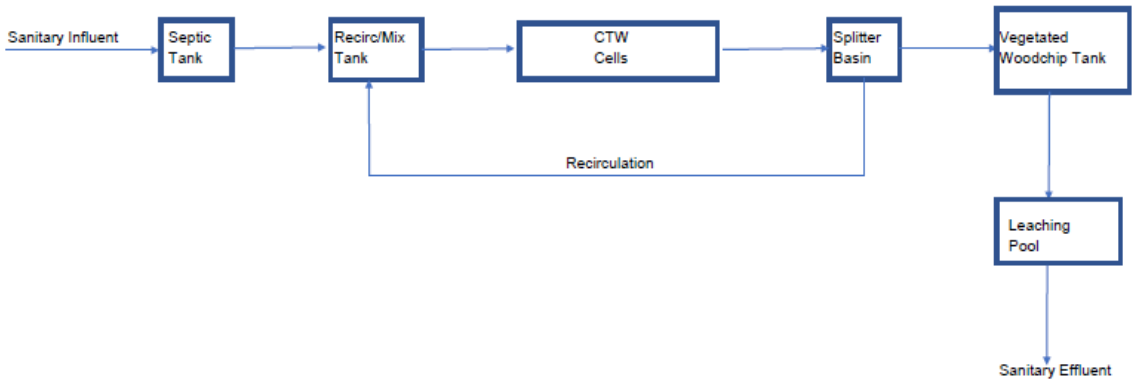
wastewater per person, this CW installation will save ~ 132 lbs of N annually from leaching to groundwater at this site, which is located very close to Quantuck Bay. This is equivalent to installing I/ OWTS's on six homes in the Town of Southampton.

3c. Describe the proposed technology and its demonstrated efficacy in similar settings. May include published data.

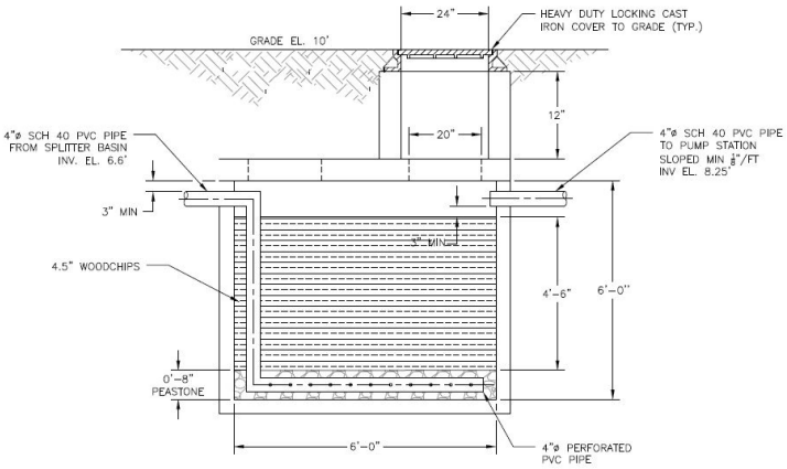
Constructed wetlands are a type of onsite wastewater treatment technology consisting of a septic tank, a recirculating wetland underlain by a gravel bed and, as proposed for this installation, a denitrifying sand/woodchip biofilter. Such configurations or components thereof have been used successful to remove total nitrogen (TN) in wastewater at commercial and residential sites in many ecologically sensitive areas. A chart of the TN removal performance of a constructed wetland installed at Sylvester Manor on Shelter Island is included below.

The treatment process in the proposed wetland relies on coupled nitrification and denitrification together with uptake of nutrients by plants. After solids settle-out in a septic tank, wastewater is pumped through a gravel bed overlaid by indigenous plants that promote both nitrogen removal and aeration / nitrification. As the wastewater is cycled thru the gravel bed, ammonia, urea and other reduced forms of nitrogen are oxidized to nitrate. A portion of the nitrate is cycled back to a chamber immediately downstream if the septic tank where it is denitrified (i.e. converted to inert N2- ~80% of the earth's atmosphere) and another portion is cycled to a drain field, consisting of sand and woodchips which also acts as a denitrifying biofilter.

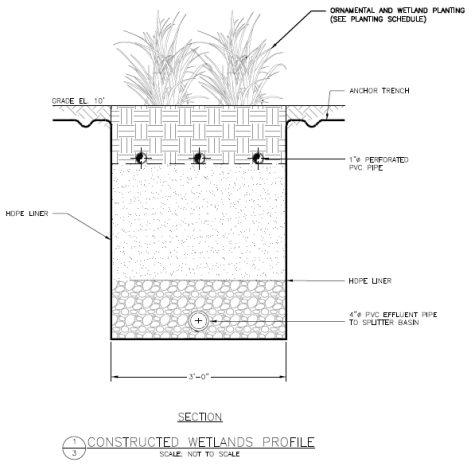
TYPICAL PROCESS FLOW DIAGRAM FOR CONSTRUCTED TREATMENT WETLANDS



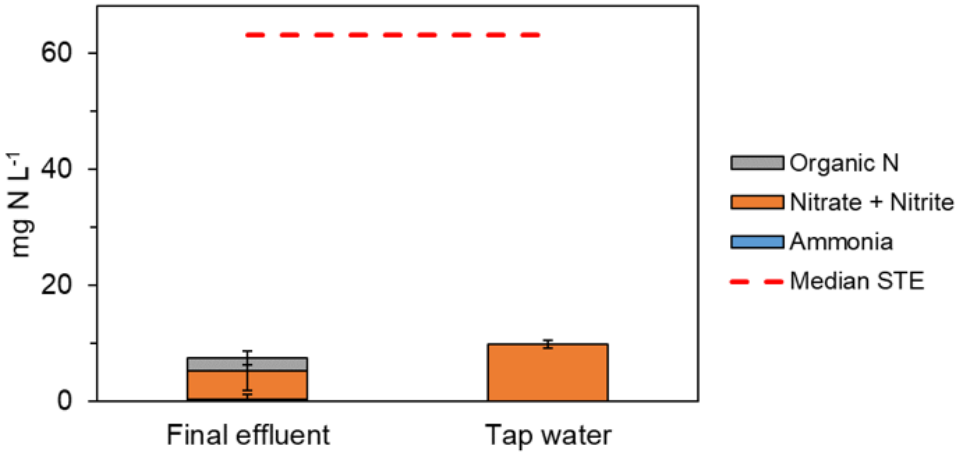

The picture below is not exactly the same as the system proposed but similar in concept. The scale elevation drawing on the next page is more precisely what is being proposed.




Typical Wood Chip Tank Detail




Typical CTW Cell Detail




Above is the performance summary over 3 years for the Sylvester Manor constructed wetland located at 80 N Ferry Rd, Shelter Island, NY. Effluent numbers are averaged over the 2018, 2019, and 2021 seasons (plus one data point in 2020). Tap water was only sampled in 2020 and 2021. There is no straightforward influent sampling location, so we have included the median septic tank effluent TN concentration reported by Lowe et al. in their 2009 monitoring survey (63 mg N/L) as a reference point. This system is reducing N is household wastewater to less than 10 mg/L and even lower than regional tap water meaning this system is helping to protect both surface waters and drinking water on Shelter Island.

Please see below for estimated nitrogen removal calculations for Quogue Wildlife Refuge. Because this project is not yet in the final design phase, Roux could not run a full model to estimate removal concentrations but based the estimate on available literature as shown below. Based on the table shown below, the total estimated nitrogen loading to groundwater at Quogue Wildlife Refuge is approximately 150 lbs/year with the existing sanitary system. Installation of a Constructed Wetlands Treatment System at this site would potentially reduce the total nitrogen loading at the site by **132 lbs/year**, which we estimate is equivalent to six I/A OWTS's in the Town of Southampton.

**Estimated Total Nitrogen Loading Comparison. Existing Sanitary System vs. Wetland Treatment System (WTS), Quogue Wildlife Refuge**

| | Flowrate[1] *GPD* | Nitrogen Loading, Total (Existing)[2] *mg/L* | Nitrogen Loading, Total (Proposed WTS)[3] *mg/L* |
|---|---|---|---|
| Nature Center | 305 | 48.0 | 5.7 |
| Residence | 300 | 48.0 | 5.7 |
| Comfort Station | 1010 | 20.0 | 5.7 |
| **ESTIMATED TOTAL** | **1615** | **30.5** | **5.7** |

Notes/Assumptions

1. Estimated flowrates for existing sanitary systems calculated based on Suffolk County Department of Health Services Standards for Approval of Plans and Construction for Sewage Disposal Systems for Other Than Single Family Residences, July 21, 2022. Table 1-1.

2. Existing nitrogen loading based on typical effluent concentrations from literature. Nature Center and Residence assumes septic tank effluent concentrations. Comfort Station assumes typical effluent concentrations at 3 ft below absorption trenches. Metcalf and Eddy, Wastewater Treatment Engineering, 5th Edition.

3. Nitrogen loading for proposed Constructed Wetland Treatment System based on typical effluent concentrations from recirculating media filter. Metcalf and Eddy, Wastewater Treatment Engineering, 5th Edition.

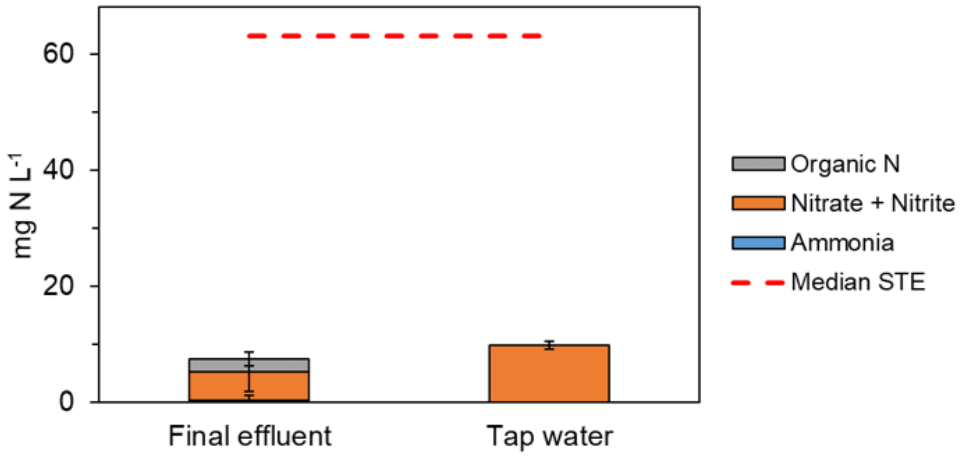
The above table indicates a nitrogen removal efficiency of approximately 84%. Note that Roux has previously constructed treatment wetlands that have achieved even higher removal efficiencies for sanitary wastewater.

**Performance Data for Constructed Treatment Wetland in Brentwood, New York – Quarter 1, 2022**

| Sampling Date | Analyte | Influent Concentration (mg/L) | Effluent Concentration (mg/L) |
|---|---|---|---|
| 1/21/2022 | Nitrogen, Total | 23 | 1.5 |
| 2/16/2022 | Nitrogen, Total | 37 | 3.5 |
| 3/28/2022 | Nitrogen, Total | 46 | 2.5 |

Source: Roux, Inc.

The table above presents recent sampling data for an existing CTW located in Brentwood, New York. The CTW provides secondary treatment for 30,000 GPD of sanitary wastewater. As shown in the table above, sampling events from quarter 1 of this year indicate a total nitrogen removal efficiency of above 90% and those samples were taken during low temperature months.




Above is the performance summary over 3 years for the Sylvester Manor constructed wetland located at 80 N Ferry Rd, Shelter Island, NY. Effluent numbers are averaged over the 2018, 2019, and 2021 seasons (plus one data point in 2020). Tap water was only sampled in 2020 and 2021. There is no straightforward influent sampling location, so we have included the median septic tank effluent TN concentration reported by Lowe et al. in their 2009 monitoring survey (63 mg N/L) as a reference point. This system is reducing N is household wastewater to less than 10 mg/L and even lower than regional tap water meaning this system is helping to protect both surface waters and drinking water on Shelter Island.

3d. How the project supports Town of Southampton, Suffolk County, NYSDEC, Long Island Nitrogen Action Plan (LINAP) or other adopted goals/policies (provide references with pages numbers).

Aside from the immediate reduction in N loadings to local groundwater and Quantuck Bay, which is a badly impaired water body, the primary benefit to Southampton estuaries is in advancing Constructed Wetland technology under Suffolk County's Article 19 septic permitting program from Experimental to Pilot and then Provisional phase testing, a critical step to general use status on Long Island. While Constructed Wetland I/A OWTS will not be the ideal solution for all homes or building across Suffolk County, they do have specific benefits and will serve as an educational center piece at the Quogue Wildlife Refuge. The benefit to water quality is expected because the N removal efficiency of Constructed Wetlands represents a substantial improvement over levels required by commercial systems provisionally approved by Suffolk County which is 19 mg-N $L^{-1}$. NYS CCWT is promulgating this non-proprietary technology as an alternative to proprietary technologies in order to enable greater competition among installers and system vendors which in turn will reduce costs for decentralized wastewater treatment across Suffolk County and the Town of Southampton.

**YES** **N/A**

- 3e. Review the following statements and indicate whether they are applicable to your project. For all "Yes" responses, please indicate how your project addresses the requirements indicated.

✓ **If stormwater system or drainage is proposed:** The project must indicate compliance with the New York State Stormwater Design Manual (2015 and as updated).

✓ **If project is related to farmland:** Describe any Agricultural Stewardship Plan or other long term strategy for Nitrogen abatement.

✓ **If the project is for habitat restoration:** The narrative must address how underlying causes are being ameliorated and expected outcomes for local species populations or other ecological considerations are given.

✓ **If project is a Sewage Treatment Plant (STP) or cluster treatment system:** Fund allocation request is based on cost for reduction of pre-existing conditions and not for purpose of accommodating new density (describe pre-existing density and associated flow (gallons per day) and total projected nitrogen reduction in narrative). Include detailed information on how many homes the system would treat as well as potential for formation of Sewer District, if required by Suffolk County Health Department or Town Law. – Please see narrative below

✓ **If the project is requesting grant match:** Include information related to funding program source and purpose of application and any relevant items on this checklist. Note: A Town Board resolution will be required in order to encumber matching funds for grant applications.

## 4. WATER QUALITY BENEFIT

4a. Identify Nitrogen, Pathogen or Pollutant of Concern (POC) including Existing Condition and Target Reduction.

High nitrogen levels have led to the degradation of salt marshes and eelgrass beds, which provides buffering against storm surges, as well as to algal blooms. (Gobler et al., 2004, 2011; NYSDEC 2009, 2014). Constructed Wetlands will provide nitrogen reduction from wastewater of 80% or greater.

4b. Describe plans for collecting and reporting on water quality over time.

While SCDHS Article 19 regulations for reporting nitrogen levels are required for a fraction of I/A systems, NYS Center for Clean Water Technology monitors wastewater analytes in the final effluent of all systems it installs and reports results to the public broadly including to SC DHS, NYS DEC and as part of design-based articles in engineering journals. Wastewater analytes will include Total Kjeldahl Nitrogen, ammonium, nitrate/nitrite, cBOD5, alkalinity, DO, pH, and temperature (final effluent and air), which will be measured on site. The Center has over four years' experience collecting and measuring these analytes; its labs are certified by the NYS Environmental Laboratory Assessment Program (ELAP) for these analytes.

CCWT has a commitment to excellence. Beyond monitoring all of our I/A systems across Suffolk County, any system that does not achieve <19 mg L-1 immediately receives a maintenance visit and hydraulic modification and further testing to ensure optimal performance. Such attention to detail contrasts with commercial installations which largely follow a 'set it, and forget it' mode will little sense of system performance.

4c. Indicate useful life of proposed technology (must meet or exceed five years).

The useful life is expected to be more than 30 years. Published articles in scientific journals (e.g., Robertson, Logan & Lombardo 2008; Groundwater Monitoring & Remediation 28) indicate woodchips continue to provide carbon for nitrate removal for decades; anecdotal evidence suggests woodchips may continue to provide carbon for nitrate removal for at least a half century. The other components of the systems have been widely in use across the Unites States for decades.

## 5. COST FACTORS

5a. Explain how you have confirmed that the proposed budget is reasonable, appropriate, and necessary. If available, provide third party estimates or other documentation of how costs were determined.

The proposed itemized budget was based on actual costs for installed NRBs across Suffolk County and prepared by, Frank Russo, PE, in consultation with Nick Polumbo, Project Engineer for Roux Environmental Engineering and Geology, DPC, an independent professional engineering firm with experience designing Constructed Wetlands.

- $214,240 = Total project cost
- $ 69,240 = Matching funds to be provided by NYS CCWT.
- $145,000 = Funds requested from the CPF.

5b. Describe any matching funds to be provided.

CCWT has paid for the soil boring, utility location, site evaluation and preliminary project design by the professional engineer. Also, CCWT will be contributing project management, monitoring services including collection and field sampling, measurement, analysis, and reporting services as in-kind matching funds. CCWT's lab is NYS ELAP certified for measurement of wastewater analytes. CCWT will also perform maintenance as needed in the first three years to assure optimal performance.

5c. Explain:

i. Why project cannot proceed and intended benefits cannot be achieved without external funding.
ii. if funds are awarded at a lower level than requested, or if there are cost overruns, explain how the project will proceed.

Grants through the Suffolk County SIP and NYS are not eligible until the I/A process achieves Article 19 Provisional Phase approval. In order to gain SCDHS acceptance, eight pilot systems must be installed and operated for at least 2 years. The NYSDEC grant to CCWT does not provide sufficient funds to install that many I/A systems. The Quogue Wildlife Refuge does not have the funds to make up for lower levels than requested. The CCWT would have to cover cost overruns out of the NYSDEC grants.

## 6. MANAGEMENT, EXPERIENCE, ABILITY

6a. Describe applicant's experience in completing similar projects.

NYS Center for Clean Water Technology at Stony Brook University ("CCWT") was founded by NYS in 2015 to promote technologies to reduce residential nitrogen inputs to groundwater and marine ecosystems. Roux Environmental Engineering has extensive experience designing Constructed Wetland systems.

Since inception, CCWT has facilitated the installation of over 25 onsite, residential wastewater treatment systems (Nitrogen Removing Biofilters) at locations across Suffolk County. To advance Constructed Wetland systems to the pilot phase of Suffolk County Department of Health Services (SC DHS) Article 19 permitting process, CCWT plans to install 6 additional Constructed Wetland systems. Each installation by CCWT is completed within several days and, on average, all CCWT designs are meeting Article 19 requirements. As noted above, in any instance an system is not meeting standards, it is immediately evaluated and modified until it has achieved optimal functionality.

CCWT has hired Nick Polumbo, with Roux Engineering and Geology, D.P.C. to evaluate the sites, design the systems, estimate the budget, submit the permit application, and make sure the system is properly installed.

6b. Describe community support or opposition to project. If there is opposition, explain how this is to be addressed.

Community support for Quogue Wildlife Refuge is evidenced by annual private donations exceeding $1 million. The Refuge is universally valued in the community. There has been zero opposition to this project. Given the thousands of Town residents who visit the Refuge annually, this project stands to serve as an excellent public demonstration project for CPF.

6c. Describe any permits needed and time frame/status of approvals. If permits are approved, indicate same.

SCDHS Article 19 compliance is required. SCDHS permitting will rely on the design and project management by Roux Environmental Engineering and Geology, D.P.C. Roux has successfully permitted other similar projects in Suffolk County.

## 7. MAINTENANCE, MONITORING, EVALUATION

Estimate ongoing maintenance costs and explain how these will be supported. Explain stewardship and monitoring activities planned for ensuring sustainability of the project.

CCWT has committed to provide three years of monitoring and testing for this site as part of the Matching funding. Ongoing maintenance is required by Suffolk County; those costs will be paid by Quogue Wildlife Refuge CCWT will also perform maintenance as needed in the first three years to assure optimal performance.

## 8. DURATION OF PROJECT

8a. Provide a projected project timeline. Note: The Committee will only make recommendations for shovel-ready projects that can commence this fiscal year.

8b. If project is multi-year or phased, provide a breakdown of budget and milestones for each year and phase. Not applicable.

## 9. REQUIRED ATTACHMENTS

Confirm that the following required documents are attached to this application:

- [x] Photos of existing conditions Location Map
- [ ] State Environmental Quality Review Act (SEQRA) Long or Short Environmental Assessment Form (EAF) https://www.dec.ny.gov/permits/6191.html
- [ ] Completed EPA Spreadsheet Tool for Evaluating Pollutant Load (STEPL) https://www.epa.gov/nps/spreadsheet-tool-estimating-pollutant-loads-stepl or similar standardized methodology (describe) Project budget (see attached template)
- [x] Ownership commitment is provided via letter of intent (LOI) for non-municipal owners or municipal resolution for municipal owners
- [ ] Public agencies must complete SEQRA on the project and submit determination of significance and associated documentation.

### OTHER ATTACHMENTS

List other attachments provided, including cost estimates, bids, plans, documentation of matching funds, and other as appropriate to demonstrate project readiness, quality, feasibility, and cost effectiveness

Site Maps
Photos & Site Layout
Engineers Site Evaluation
Engineers Proposed Site Layout & Soil Boring
Assessment of Water Quality in Quantuck Bay

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP



# Budget Proposal

Is the applicant a municipality group? ☐ Yes ☑ No

| www.southamptontownny.gov/WQIPP PLANNING/ENGINEERING/DESIGN | Town CPF Request | Matching Funds Committed | Matching Funds Pending | Estimated Total Project Costs |
|---|---|---|---|---|
| Task 1- Site Assessment by Roux Engineers | $- | $ 4,240 | $- | $ 4,240 |
| Task 2-Preparation of Construction Documents (Plans) | $ 16,500 | $- | $- | $ 16,500 |
| Task 3-Engineering During Construction | $ 15,000 | $- | $- | $ 15,000 |
| Task 4-Project Startup, Training, Commissioning | $ 5,000 | $- | $- | $ 5,000 |
| Task 5-Project Closeout Registration Services | $ 2,000 | $- | $- | $ 2,000 |
| Task 6- Wetlands Permit by Engineer | $ 10,000 | $- | $- | $ 10,000 |
| Task 7- CCWT Project Management | $- | 20,000 | $- | $ 20,000 |
| Planning/Engineering/Design Cost Total | $ 48,500 | $ 24,240 | $- 0.00 | $ 72,740 |

| Contractual Services | | | | |
|---|---|---|---|---|
| An Engineer will be retained to design the system | $- | $- | $- | $- 0.00 |
| (See Table above) | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| A Contractor will be selected to install the system | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| Contractual Services Cost Total | $- 0.00 | $- 0.00 | $- 0.00 | $- 0.00 |

| Construction & Site Improvements | | | | |
|---|---|---|---|---|
| All costs including labor are included in the table below | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| | $- | $- | $- | $- 0.00 |
| Construction & Site Improvements Cost Total | $- 0.00 | $- 0.00 | $- 0.00 | $- 0.00 |

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP



| Equipment/Materials/Supplies | Town CPF Request | Matching Funds Committed | Matching Funds Pending | Estimated Total Project Costs |
|---|---|---|---|---|
| Heavy equipment mobilization/demobilization and fuel | $ 10,000 | $- | $- | $ 10,000 |
| Abandon existing sanitary system per SCDHS reqts | $ 3,300 | $- | $- | $ 3,300 |
| Two septic tanks installed | $ 7,800 | $- | $- | $ 7,800 |
| 2 pump stations and recirc. tank w/ pump installed | $ 12,000 | $- | $- | $ 12,000 |
| Gravity yard piping, force main, fittings, valves, valve boxes | $ 17,000 | $- | $- | $ 17,000 |
| Effluent disposal system reused and new shallow trenches | $ 7,900 | $- | $- | $ 7,900 |
| Electrical work and modifications | $ 16,000 | $- | $- | $ 16,000 |
| Denitrification woodchip box (nitrate polishing) | $ 10,000 | | | $ 10,000 |
| Site restoration, top soil and seed | $ 6,000 | | | $ 6,000 |
| Relocate existing materials | $ 4,000 | | | $ 4,000 |
| Testing and commissioning | $ 2,500 | | | $ 2,500 |
| | | | | |
| Equipment/Materials/Supplies Total | $ 96,500 | $0.00 | $-0.00 | $ 96,500 |

| Additional Cost | | | | |
|---|---|---|---|---|
| | $- | | | |
| CCWT Performance Monitoring (Sampling and Lab Testing) | $- | $ 45,000 | $- | $ 45,000 |
| $15,000/year for 3 years | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Additional Cost Total | $-0.00 | $ 45,000 | $-0.00 | $ 45,000 |

| | | | | |
|---|---|---|---|---|
| Planning/Engineering/Design Cost Total (from page 7) | $ 48,500 | $ 24,240 | $- 0.00 | $ 72,740 |

| | |
|---|---|
| Total Project Cost | $ 214,240 |
| Applicant matching funds committed | $ 69,240 |
| Applicant matching funds pending approval (e.g. grant request submitted pending determination) | $ 0 |
| Total CPF Funds Requested | $ 145,000 |

| Source of matching funds | Amount |
|---|---|
| | |
| NYS Center for Clean Water Technology, ("CCWT") | $ 69,240 |
| | |

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP



# The following Table shows the calculation used to estimate In Kind Contribution Match from CCWT

## (this estimate was rounded down to $15,000/year for 3 years)

| **In kind Contribution Schedule** | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **NYS Center for Clean Water Technology** | | | | | |
| Analytical Services: | | cost/sample | mo. samples | duration (mo) | |
| NH4+ | | $20 | 3 | 12 | $720.00 |
| NO3-/NO2- | | $12 | 2 | 12 | $288.00 |
| NO2- | | $12 | 1 | 12 | $144.00 |
| TkN | | $28 | 3 | 12 | $1,008.00 |
| Alkalinity | | $15 | 3 | 12 | $540.00 |
| BOD5 | | $30 | 2 | 12 | $720.00 |
| TOC | | $80 | 2 | 12 | $1,920.00 |
| TSS | | $20 | 1 | 12 | $240.00 |
| PO43- | | $20 | 0 | 0 | $0.00 |
| 1,4 dioxane | | $200 | 0 | 0 | $0.00 |
| Sampling & Analytical Services per site | | | | | $5,580.00 |
| Sites per project | | | | | 2 |
| Subtotal Analytical costs/yr | | | | | $11,160.00 |
| | | | hours | hourly rate | |
| Wastewater Analyst | Analysis & Reporting | | 12 | $35.79 | $429.51 |
| Field Technician | | | 96 | $25.76 | $2,472.92 |
| SubTotal Monitoring Labor/yr | | | | | $2,902.43 |
| | | | | | |
| **Subtotal Monitoring Costs** | | | | | $14,062.43 |
| | | | | | |
| **Management & Installation Oversight** | | | hours | hourly rate | |
| Project Manager | pre- installation select & coord | | 32 | $52.37 | $1,675.73 |
| | installation (on-site inspection | | 32 | $52.37 | $1,675.73 |
| | Analysis & reporting | | 12 | $52.37 | $628.40 |
| | | | | | |
| Administrator | administrative | | 12 | $52.00 | $624.00 |
| SubTotal Management and Admin Costs | | | | | $4,603.87 |
| | | | | | |
| **Total NYS CCWT** | | | | | $18,666.30 |

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP

2022

## COMMUNITY PRESERVATION FUND (CPF)
## WATER QUALITY IMPROVEMENT PROGRAM

2022

### APPLICANT'S INFORMATION

| | |
|---|---|
| Owner: | Southampton Town Wildfowl Association (STWA), a 501 (c)(3) |
| Contact First and Last Name: | Michael Nelson |
| Contact Address: | PO Box 492, Quogue, NY 11959 |
| Contact Phone: | 631-653-4771 |
| Contact Email: | michael@quoguewildliferefuge.org |

### CONTRACT RECIPIANT INFORMATION

| | |
|---|---|
| Name/Organization: | Southampton Township Wildfowl Association, dba Quogue Wildlife Refuge |
| Contact Person/Officer: | Michael Nelson |
| Contact Address: | PO Box 492, Quogue, NY 11959 |
| Contact Phone: | 631-653-4771 |
| Contact Email: | michael@quoguewildliferefuge.org |

### PROJECT INFORMATION

| | |
|---|---|
| Project Title: | Quogue Wildlife Refuge Constructed Wetland |
| Project Location: | 3 Old Country Rd, Quogue, NY 11959 |
| Project Description: | Replace three existing septic systems with a single new type of I/A OWTS called a Constructed Wetland. |

### ANTICIPATED PROJECT TIMELINE

| | |
|---|---|
| Begin: | Jan 15, 2023 |
| Complete: | Jan 31, 2023 |
| Notes: | Project will only take a few days to construct once the Town Board approval and Town contracting processes are completed and the permit is issued. The site is shovel ready. |

### ATTESTATION

Allocation of CPF funds will not be for the purpose of accommodating new growth, as this is prohibited by State law.

Check all boxes & sign.

☑ We certify that funds will not be directed for projects for the purpose of accommodating new growth.

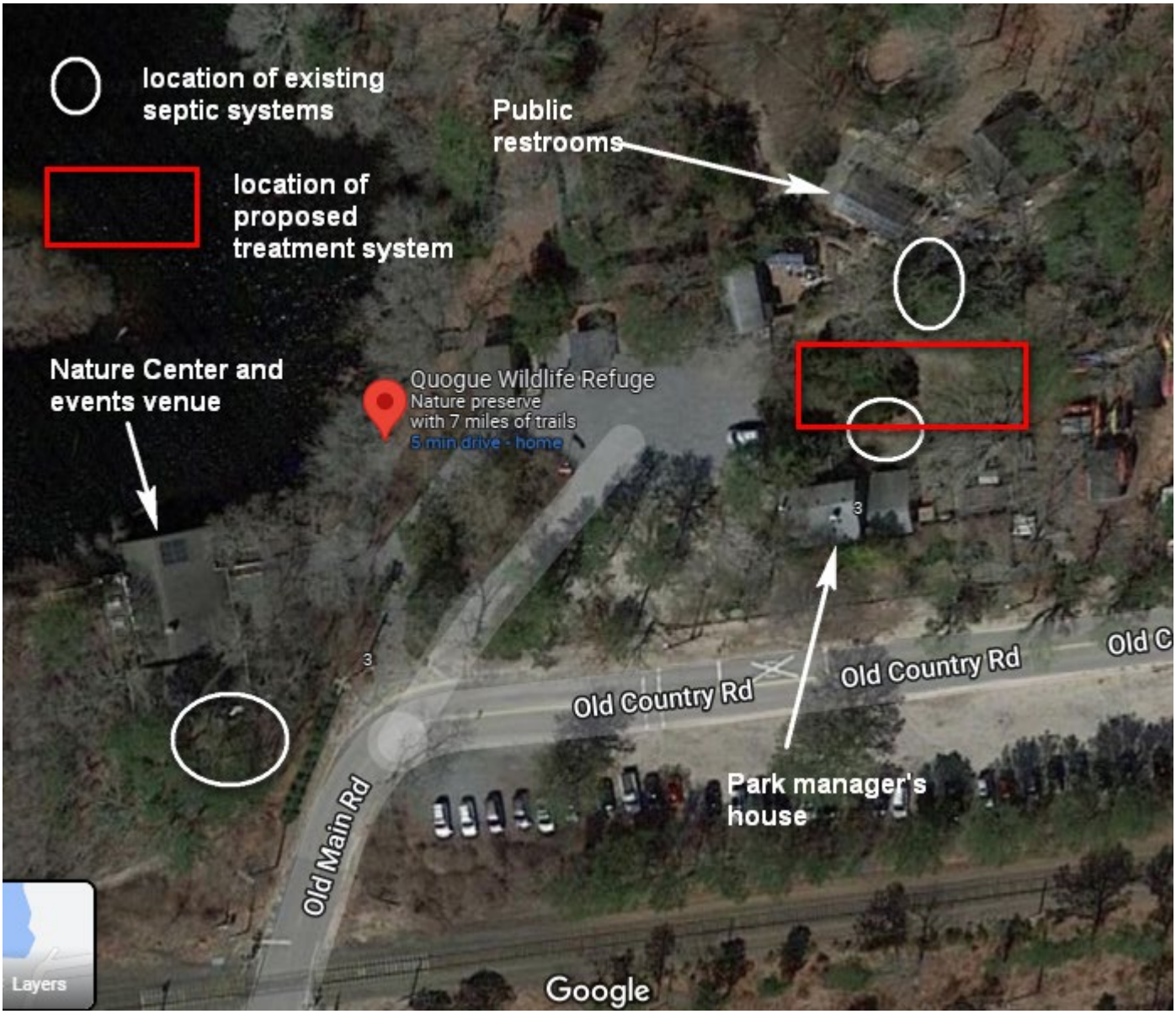
☑ We understand that progress reports will need to be generated as specified in our Water Quality Improvement Contract AND a final report showing qualitative and/or quantitative data will be generated upon project completion.

Signature: _____ Date 3.29.22

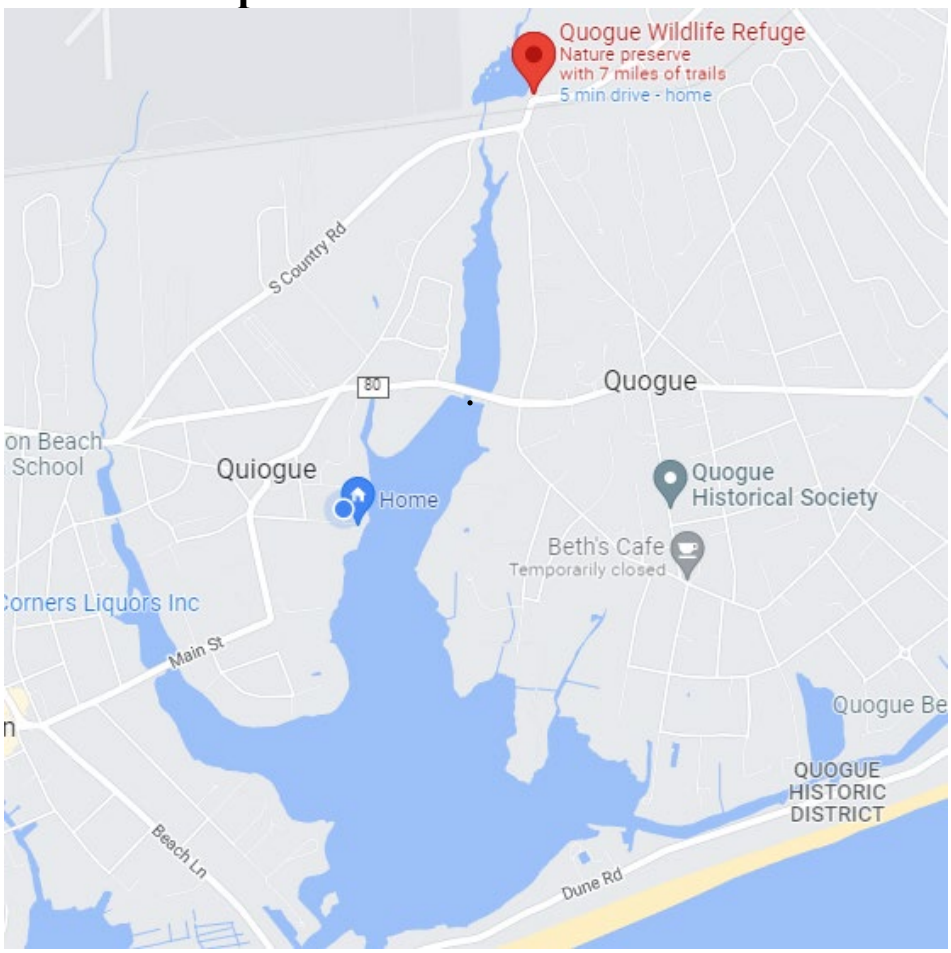
# Attachments:

Site Map
Photos & Site Layout
Engineers Site Evaluation
Engineers Proposed Site Layout & Soil Boring
Assessment of Water Quality in Quantuck Bay

# Photos and Site Layout



# Location Map



April 8, 2022

ROUX

Mr. Frank M. Russo
NYS Center for Clean Water Technology
1000 Innovation Road, Room 100A
Stony Brook, NY 11794-604

Re: Site Reconnaissance and Evaluation for Wetland Treatment System Feasibility
Quogue Wildlife Refuge and Bridge Gardens, Town of Southampton, New York

Dear Mr. Russo:

Roux Environmental Engineering and Geology, D.P.C. (Roux) has prepared this letter report to provide the NYS Center for Clean Water Technology (Client) with a summary of the site evaluation and reconnaissance activities completed for two properties located in the Town of Southampton, New York. The purpose of these activities was to evaluate the feasibility of installing Wetland Treatment Systems (WTSs) for the treatment of sanitary wastewater at the properties. The properties evaluated as a part of this task included the following:

1) Quogue Wildlife Refuge (QWR) – 3 Old Country Road, Quogue, NY 11959
2) Bridge Gardens – 36 Mitchell Ln, Bridgehampton, NY 11932

The following subsections provide a summary of the site evaluation and reconnaissance activities completed, key findings, and Roux's recommendations.

**SUMMARY OF ACTIVIES PERFORMED**

Roux performed Site reconnaissance activities at each property on March 25, 2022. Roux met with representatives of each property and the Client's representative during the site visits. Additionally, Roux subcontracted drilling services from Eastern Environmental Solutions, Inc. to complete a subsurface test hole at the properties. The following activities were completed:

- Inspection and evaluation of existing site conditions;
- Inspection of existing sanitary system and adjacent site features;
- Inspection of existing buildings' basements to identify sanitary discharge line locations and other utilities entering the building;
- Inspection of existing buildings' electrical control panel;
- Completion of a test hole to a depth of approximately 3 feet below the observed groundwater table (if encountered);
- Documentation of soil lithology observed in soil boring cores from each test hole; and
- Interview with property owner representatives. Soil boring logs depicting soil lithology and photographs from Roux's site reconnaissance are included as Attachments 1 and 2.

A summary of key findings for each Site is presented below.

**SUMMARY OF FINDINGS AND RECOMMENDATIONS**

A summary of key findings from Roux's reconnaissance activities is presented below.

**Quogue Wildlife Refuge**

QWR is utilized as a nature preserve that is open to the general public. A summary of key findings from the Site reconnaissance are presented below:

- Existing Site Buildings:
  - One (1) improved 1-story building utilized as a nature center and includes an office, auditorium, library and kitchen. Contains two (2) bathrooms and a crawl space. Electrical panel capacity is 200 amps, open circuits were available.

- One (1) improved 2-story residence with three (3) bedrooms and two (2) bathrooms, contains a partial basement.
- One (1) improved 1-story frame building utilized as a comfort station primarily used by the general public.
- Animal pens and one (1) improved enclosure utilized as a feed shed.
- Various additional unimproved enclosures that do not generate a wastewater stream.

- Existing Sanitary System:
  - Nature Center - Two (2) cesspools
  - Residence – One (1) cesspool
  - Comfort Station – One (1) 1,000-gal septic tank with outlet filter; one (1) distribution box; and shallow adsorption field with (4) gravel trenches.
- Depth to Groundwater: 7 feet below land surface (ft bls)
- Private Wells: None. Property improved with public water.
- Wetlands: Site is located in a State Regulated Checkzone (adjacent to Ice Pond).
- Sanitary Flow:
  - Approximately 1,500 to 2,100 gallons per day (GPD).

Based on the above, Roux has determined a WTS for QWR would be feasible and could be constructed to handle all three (3) sanitary wastewater streams at the Site. Based on Roux's preliminary evaluation, the WTS would likely consist of the following new construction components:

- Two (2) new septic tanks
- Two (2) pump stations
- One (1) recirculating mixing tank with pump
- Constructed wetlands (approximately 500 SF)
- One (1) splitter basin for recirculating WTS effluent back to mixing tank
- Denitrifying woodchip bed or galleys (approximately 700 SF)
- Shallow drain field consisting of gravel adsorption trenches or equivalent

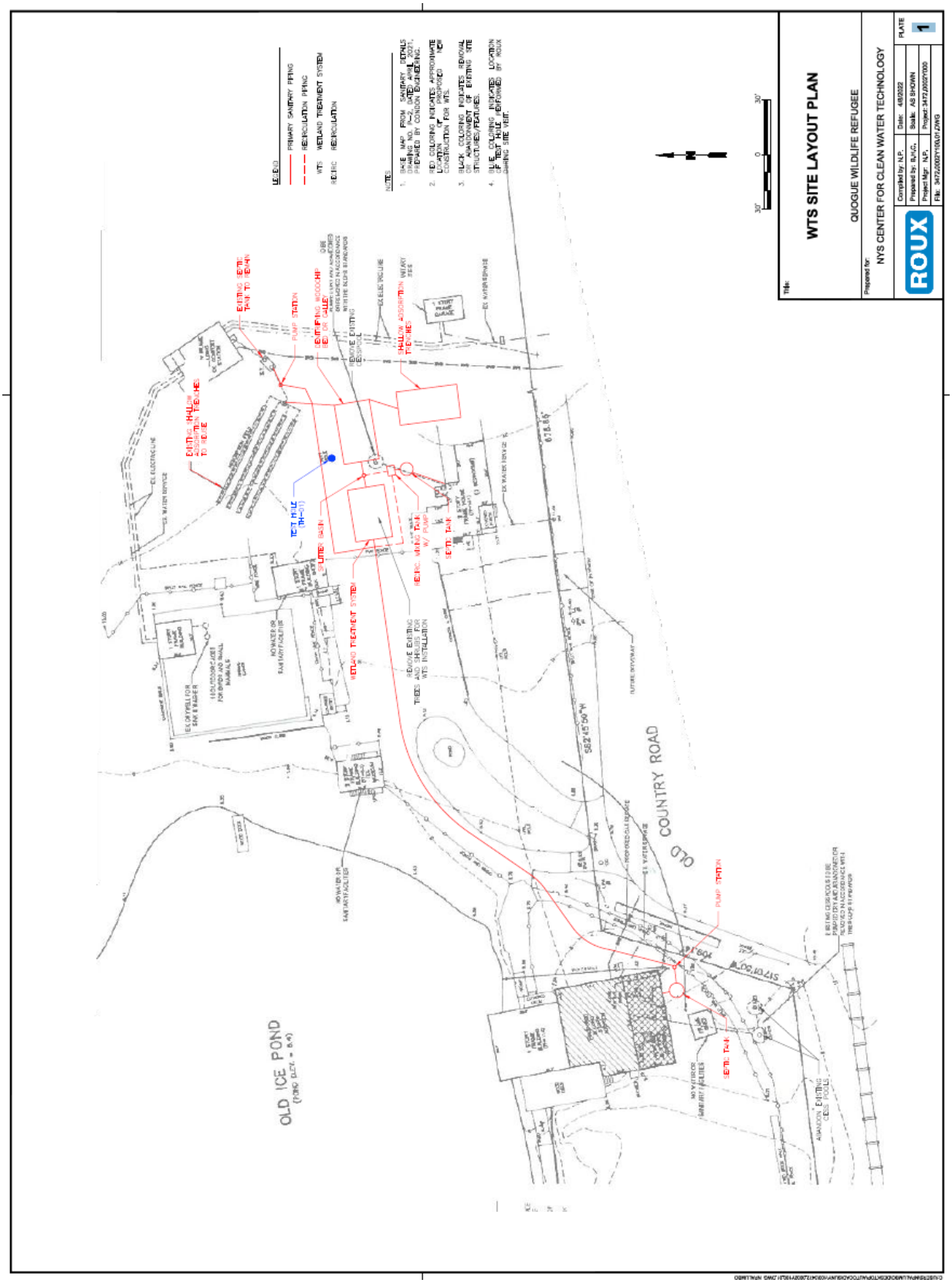
The existing cesspools for the Nature Center and Residence would have to removed/abandoned and replaced with septic tanks. The existing sanitary system for the Comfort Station was designed by the New York State Department of Environmental Conservation (NYSDEC) and includes shallow leaching. Roux recommends reusing the components of the Comfort Station system, as shown on Plate 1.

Plate 1 depicts a preliminary layout of the WTS and associated system components.

Sincerely,

**ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.**
Nicholas Palumbo
Project Engineer

Charles J. McGuckin, P.E.
Principal Engineer/Vice President


WTS SITE LAYOUT PLAN
QUOGUE WILDLIFE REFUGEE
NYS CENTER FOR CLEAN WATER TECHNOLOGY
ROUX
COUNTRY ROAD 079
OLD ICE POND

# Site Photos

Photograph 1: Location of proposed WTS and shrubs to be removed.

Photograph 2: Location of existing septic tank for Comfort Station

Photograph 3: South side of Nature Center.

Photograph 4: Soil boring core.

**TOWN OF SOUTHAMPTON**
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
www.southamptontownny.gov/WQIPP

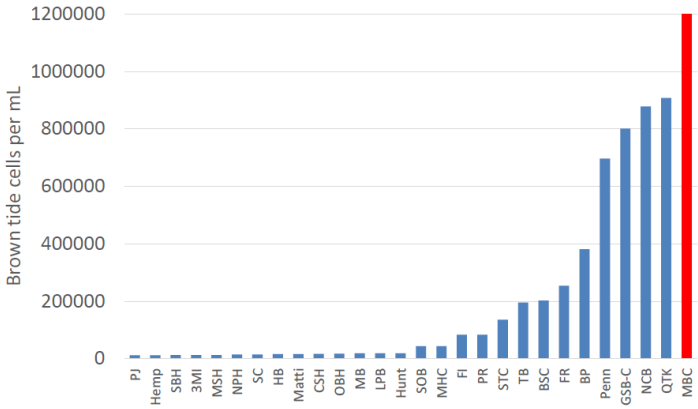


# Assessment of Water Quality in Quantuck Bay

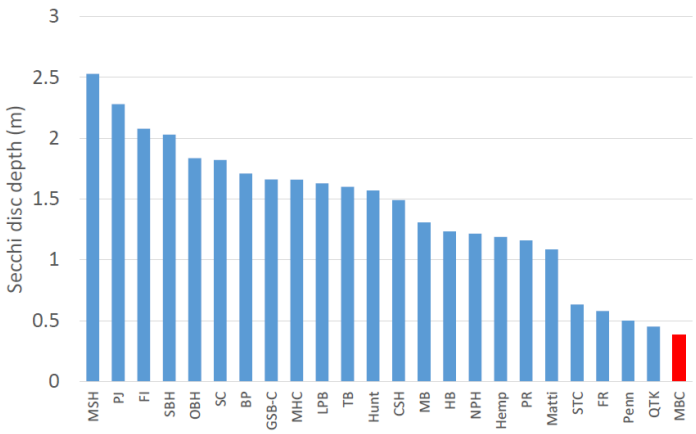
The water quality parameters of Quantuck Bay are among the worst in all of Long Island. They are characterized by the highest concentrations of brown tides which kills grasses and shellfish and devastates the ecosystem.

Source of the following:
QUANTIFYING NITROGEN LOADING FROM THE VILLAGE OF WESTHAMPTON BEACH TO SURROUNDING WATER BODIES AND THEIR MITIGATION BY CREATING A SEWER DISTRICT, Christopher J. Gobler, PhD, June 2017

Brown tide levels across 28 sites around Long Island as measured during the summers of 2014-2016 by the Gobler Lab's water quality reporting to News 12. Quantuck Bay was the second worst site across all of Long Island.




Water clarity across 28 sites around Long Island as measured during the summers of 2014-2016 by the Gobler Lab's water quality reporting to News 12. Quantuck Bay was the second worst site across all of Long Island.



7.3.23 Quantuck Bay (1701-0042)

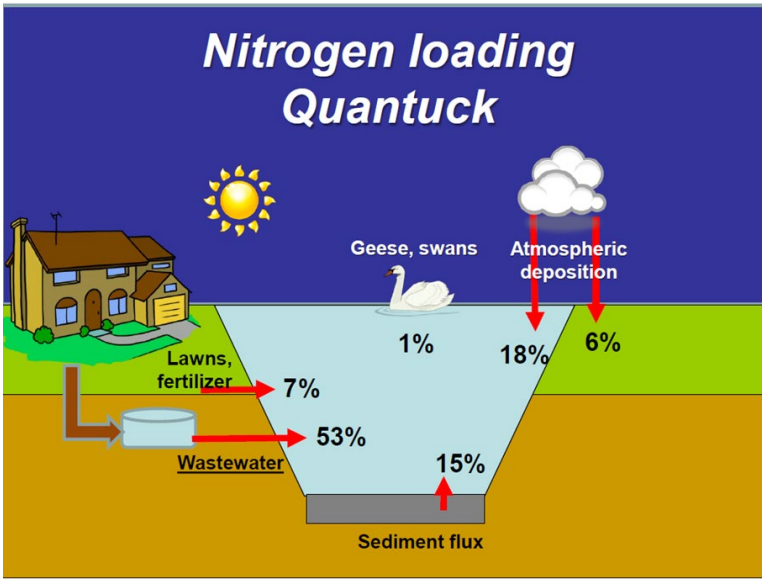
Table 7-67. WTM Fecal Coliform Loads to Quantuck Bay – Quantuck Creek

| SOURCES | Billion FC/year |
|---|---|
| POINT SOURCES | |
| Sewage Treatment Plant | 0 |
| RESIDENTIAL/URBAN LAND[1,2] | |
| MS4 Contribution | 1,560,945 |
| Non-MS4 Contribution | 0 |
| OTHER NONPOINT SOURCES | |
| Rural Land | 260 |
| Forest | 6,543 |
| Waterfowl | 1,304 |
| TOTAL LOAD (Billions) | 1,569,052 |

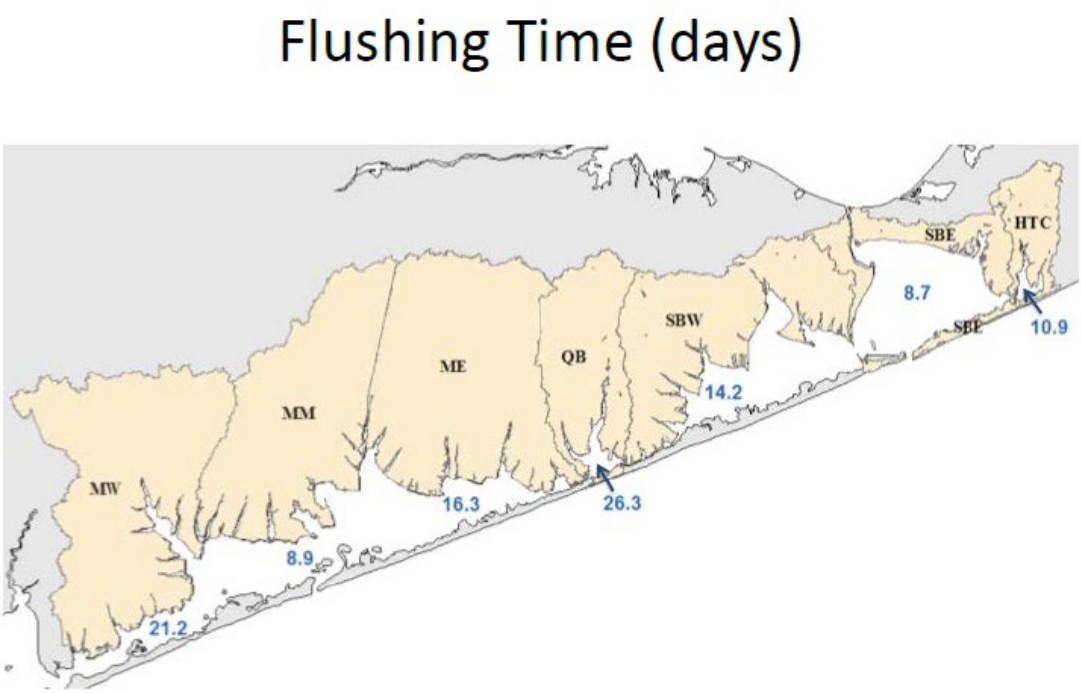
[1] "Urban land" is a combination of residential land, commercial land, industrial land, and roadways.
[2] This source includes the load from domestic pets of 1,156,320 billion FC/year.

Table 7-68. Summary of Current Fecal Coliform Loads and Percent Reductions Necessary to Meet Target TMDL Loads in Quantuck Bay – Quantuck Creek

| | Condition | Quantuck Creek | Load Reduction | Load Reduction (%) |
|---|---|---|---|---|
| Existing Conditions (billion FC/yr) | Nonpoint Sources | 8,107 | - | - |
| | Permitted Point Source Contributions—STPs | 0 | - | - |
| | Permitted Point Source Contributions—MS4s | 1,560,945 | - | - |
| | Total Existing Loads | 1,569,052 | - | - |
| TMDL (billion FC/day) | LA | 2 | 20 | 91 |
| | WLA—STPs | 0 | 0 | 0 |
| | WLA—MS4s | 385 | 3,892 | 91 |
| | MOS | - | - | - |
| | TMDL | 387 | 3,912 | 91 |
| TMDL (billion FC/yr) | LA | 730 | 7,377 | 91 |
| | WLA—STPs | 0 | 0 | 0 |
| | WLA—MS4s | 140,485 | 1,420,460 | 91 |
| | MOS | - | - | - |
| | TMDL | 141,215 | 1,427,837 | 91 |



The primary reason why pollution has been so devastating to Quantuck Bay is the extended flushing time. The Bay is surrounded by water bodies that have long flushing times and it is not regularly rejuvenated by clean ocean water from the inlets. Below the map shows that it takes 26 days for the water in Quantuck Bay to flush




Source: Town of Southampton HAB Modeling, Chris Gobler

**Pollutant Loads In lieu of a STEPL calculation**

CCWT used a Nitrogen Loading Model (NLM) described in Bowen, et al (2007). This method has recently been used by Suffolk County. That model shows very strong correlation to actual measurements and that within Quantuck Bay, alone, cesspools/septic systems and atmospheric deposition contribute the highest nitrogen loads.