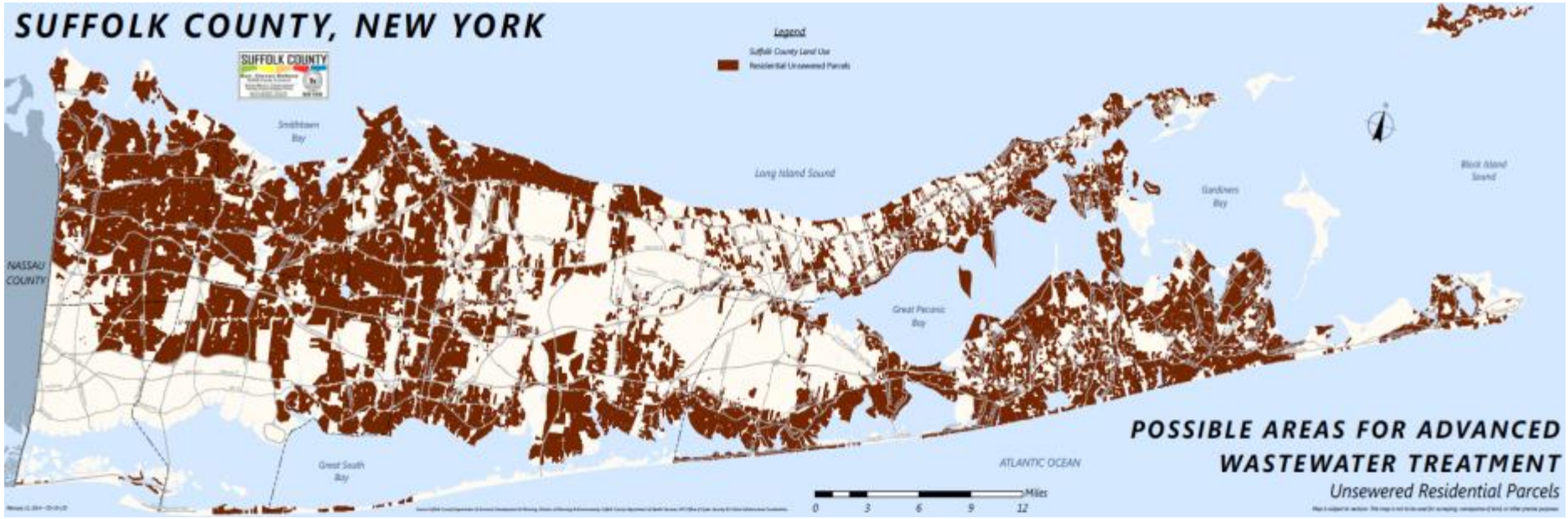
Suffolk County's Reclaim Our Water Initiative Overview

Innovative and Alternative Onsite Wastewater Treatment Systems Overview

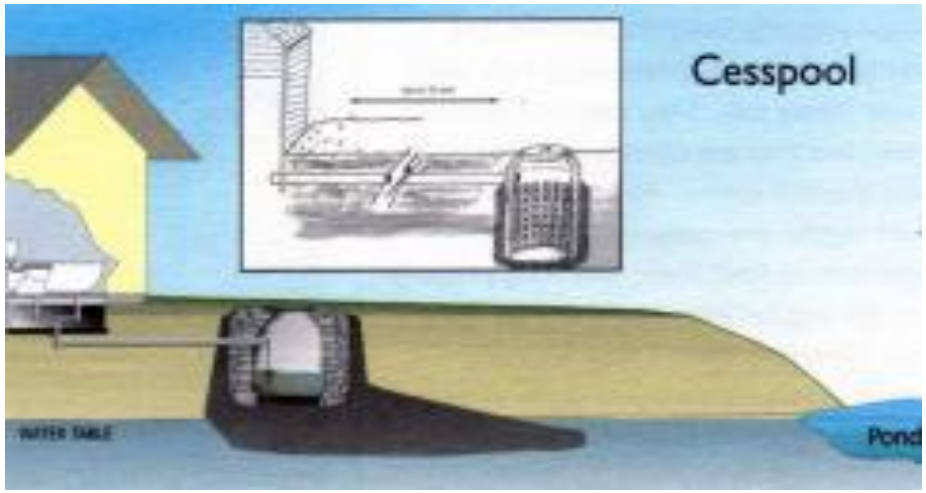
August 17, 2018

74% Non-Performing Wastewater Treatment

- Approximately 360,000 onsite sewage disposal system
- 209,000 systems in priority areas
- Approximately 252,530 pre-date requirement for septic tank



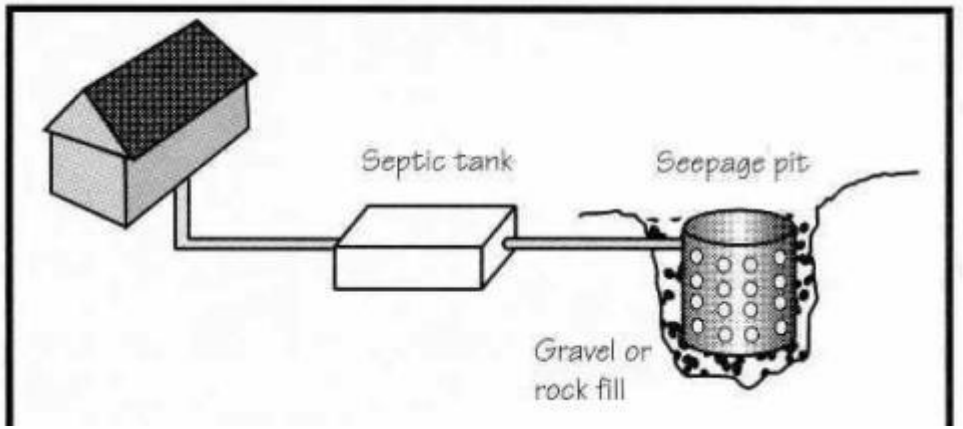
CESSPOOLS



Cesspools – ~250,000 in Suffolk County

- ✓ Cesspools are little more than holes in the ground that discharge raw, untreated human waste and can contaminate surface and groundwater sources and contributes to harmful algal blooms
- ✓ Untreated wastewater from cesspools contains pathogens such as bacteria, protozoa and viruses that can cause gastroenteritis, Hepatitis A, conjunctivitis, leptospirosis, salmonellosis and cholera
- ✓ EPA banned large capacity cesspools and strongly discourages use of small cesspools.
- ✓ Outlawed in Suffolk County for New Construction Since 1973
- ✓ Homeowners can currently replace failed cesspools in-kind
- ✓ Cesspool average installations range from $2,000 - $4,000

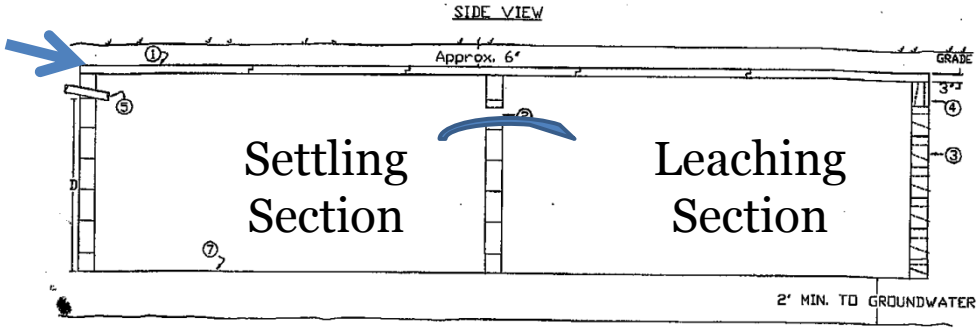
CONVENTIONAL SEPTIC SYSTEMS

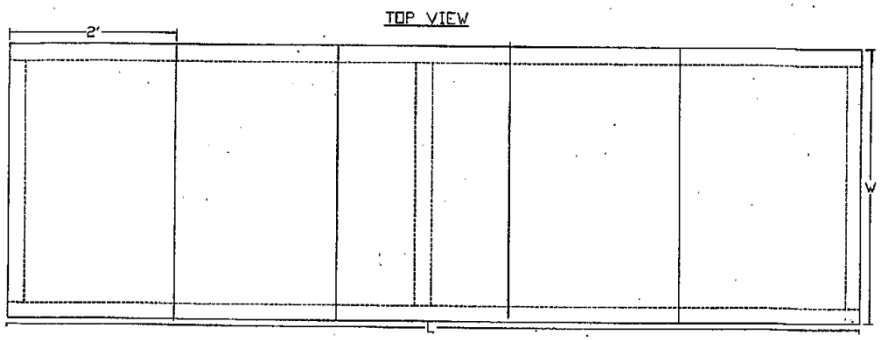


Conventional Septic Systems – ~110,000 in Suffolk County

- ✓ Conventional systems consist of a septic tank before leaching structure (In most cases a leaching pool)
- ✓ Tanks collect solids, reduce BOD, TSS, other contaminants and protect leaching structure from excessive solids and clogging
- ✓ Conventional system installations typically range from $6,000 - $8,000
- ✓ **This is the minimum code compliant system required**
- ✓ **Permitted when a site meets Article 6 Density**

Typical Fire Island Sewage Disposal System Permitted Prior to revision of Standards





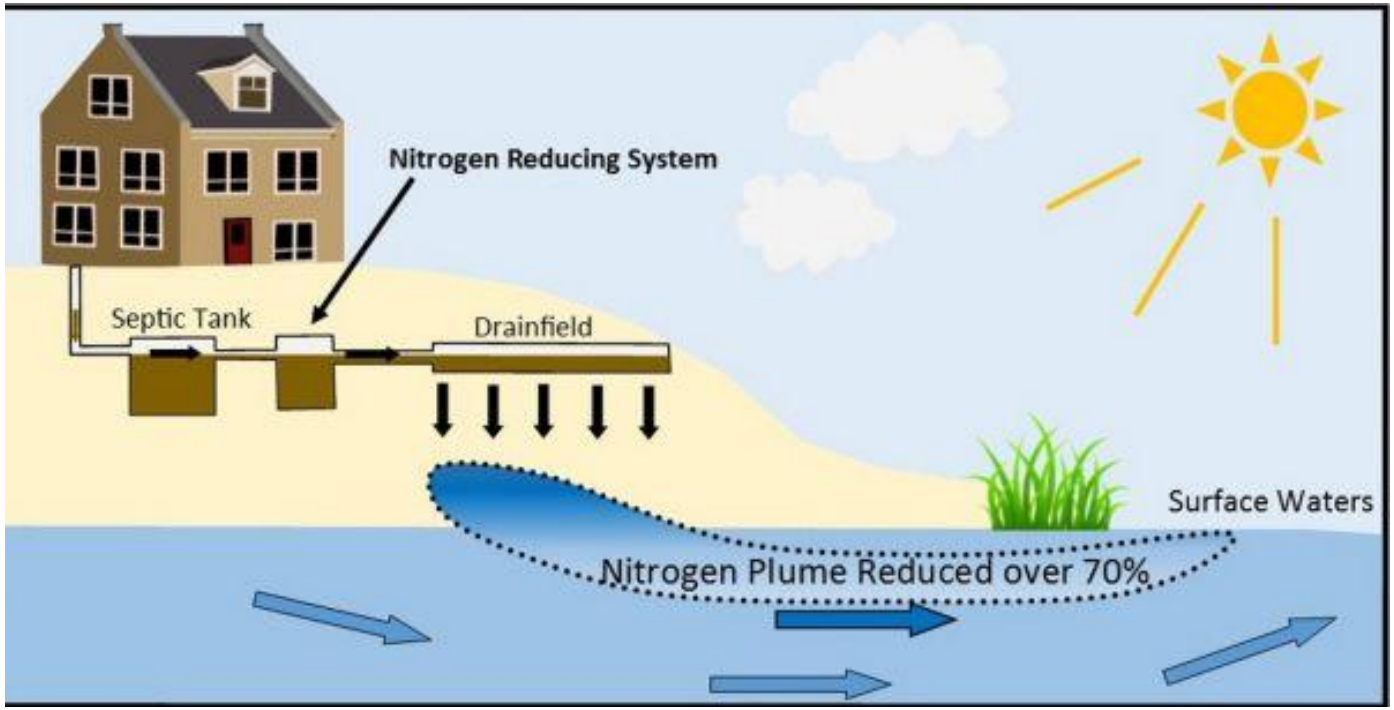
TYPICAL SYSTEM DIMENSIONS			
L	W	D	COURSES
10'	5'	48"	6
14'	5'	40"	5
16'	5'	32"	4

Note: Revised standards permit alternative septic tank materials that are lightweight. Therefore, SCDHS requires separate septic tank prior to FI system or other type of leaching if approval from the Department is required

NON-CONCRETE SEPTIC TANKS

- fiberglass, polyethylene, polypropylene, thermoplastics, or other materials
  - steel septic tanks prohibited
- Walls, floors, roof and access covers shall resist a min. force of 300 psf
- Min. 3” drop across the tank
- Must have 2 compartments (1st 50-70% vol.)
- Installed 8ft to driveway or parking area
- **Examples:**
  - Roth Septic tanks
  - Infiltrator Septic tanks

I/A OWTS

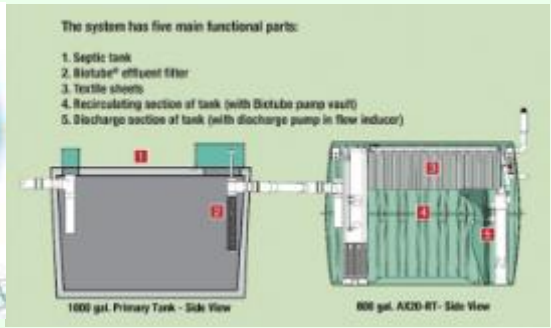


I/A OWTS ~300 Approved in Suffolk County

- ✓ Advanced treatment systems that reduce BOD, TSS and remove up to 70% of Total nitrogen.
- ✓ Allowed on Voluntary basis in SC since 2016
- ✓ I/A OWTS designs & installations have an average cost of $19,500
- ✓ **THESE CHANGES DO NO REQUIRE I/A OWTS**

Types of I/A OWTS technologies Approved in Suffolk County

- Aerobic treatment units
- Media filters
- Nitrogen Reducing Biofilters
  - These will be covered by Glynis



SEPTIC DEMONSTRATION PROGRAM (I/A OWTS)

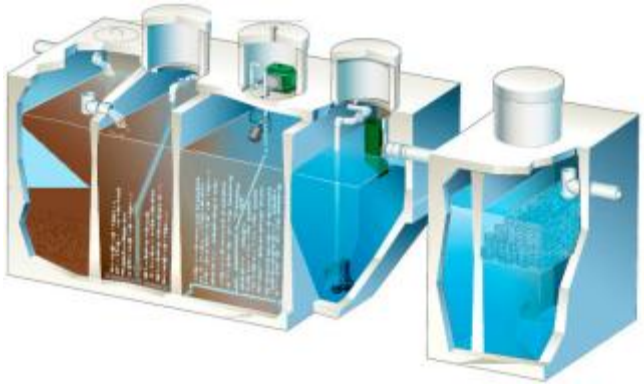
- *Phase 1 - Septic Demo Program*
  - Manufacturer Selection
    - 4 manufacturers 6 systems for a total of 19 systems
      - Hydroaction AN series
      - Norweco Singulair TNT
      - Norweco Hydro-Kinetic
      - Orenco Advantex RT Series
      - Orenco Advantex AX Series
      - BUSSE MBR
- *Phase 2 - Septic Demo Program*
  - 6 manufacturers, 7 types of systems at 19 sites
    - Biomicrobics
      - BioBarrier and SeptiTech
    - Amphidrome
    - Ecoflo Cocofilter
    - Pugo System
    - Fuji System
    - Waterloo Biofilter

PROVISIONALLY APPROVED I/A OWTS

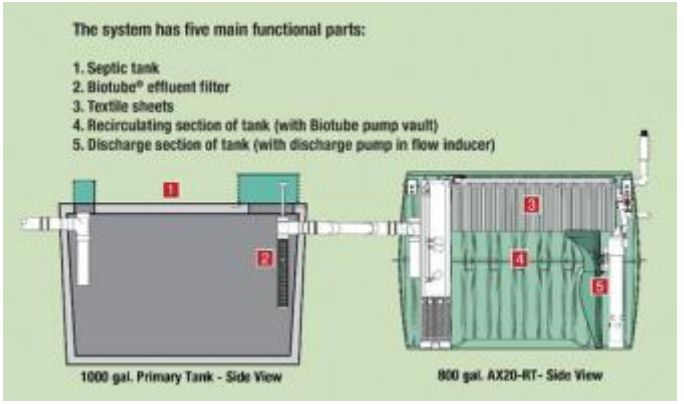
Hydro-Action

Fuji Clean System

Norweco Singlair TNT



Norweco Hydrokinetic



Orenco Advantex AX-RT

Performance Summary of I/A OWTS Demonstrated in Suffolk County and Approved for Provisional Use

Technology	AVG (Mg/L)*	Provisional Approval
Hydro-Action AN Series	11.6 mg/L	Approved in September 2016
Norweco – Singulair TNT	18.3 mg/L	Approved in October 2016
Orenco Advantex – RT	18.8 mg/L	Approved in March 2017
Norweco – Hydro-Kinetic	17.4 mg/L	Approved in April 2017
Fuji Clean System	16.6 mg/L	Approved in January 2018

*Standard is 19mg/L

Provisional Sampling Results

Technology	AVG (Mg/L)*	# of Systems	Provisional Approval
Hydro-Action AN Series	15.6 mg/L	13	Approved in September 2016
Norweco – Singulair TNT**	~~39.6 mg/L~~ 35.7 mg/L	7	Approved in October 2016
Orenco Advantex – RT	~~33.1 mg/L~~ 33.3 mg/L	2	Approved in March 2017
Norweco – Hydro-Kinetic	~~28.2 mg/L~~ 26.3 mg/L	5	Approved in April 2017
Fuji Clean System	14.5 mg/L	4	Approved in January 2018

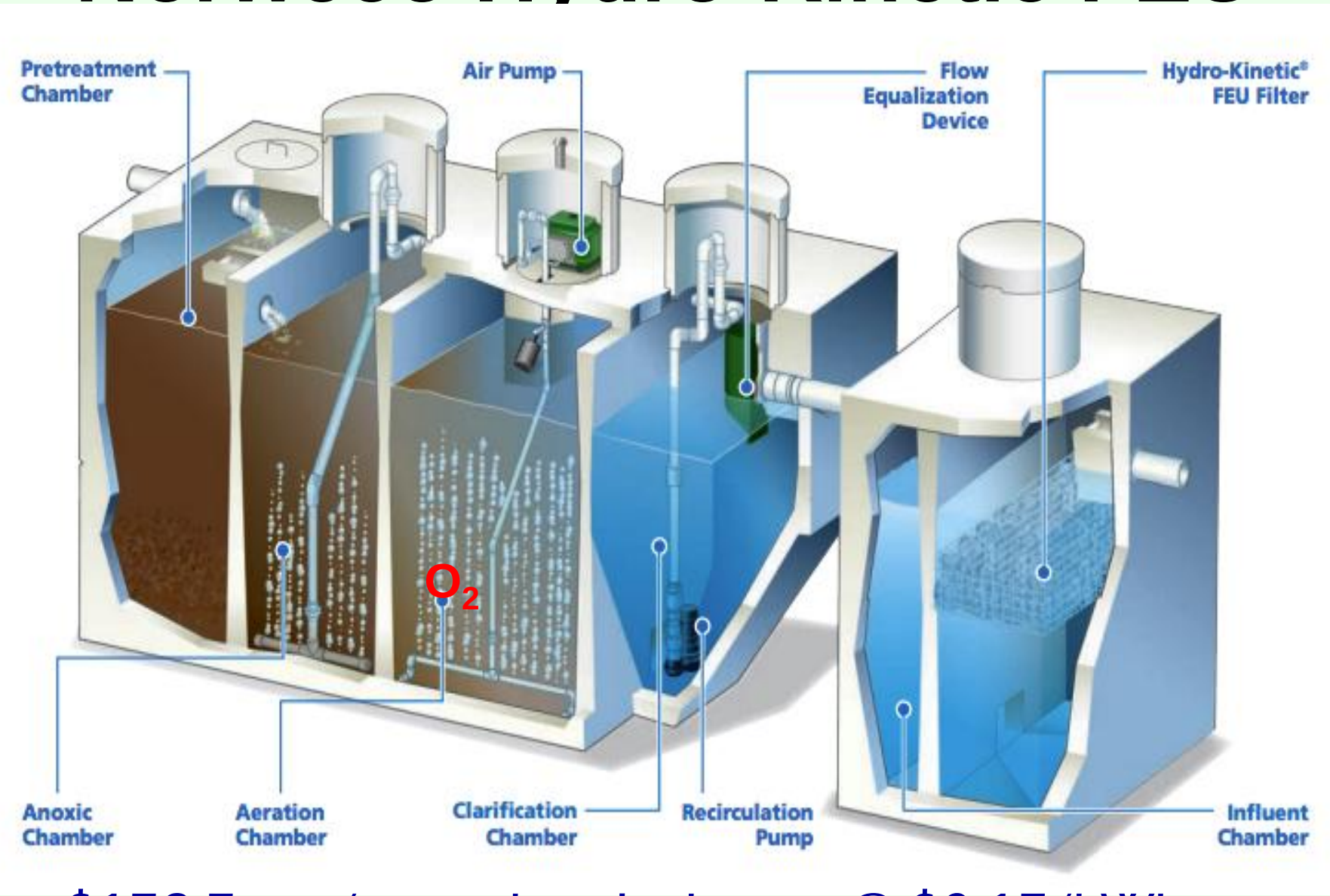
* Standard is 19 mg/L

** Since March 2018 Norweco Singulair TNT's have averaged 24 mg/L

Norweco Singulair TNT

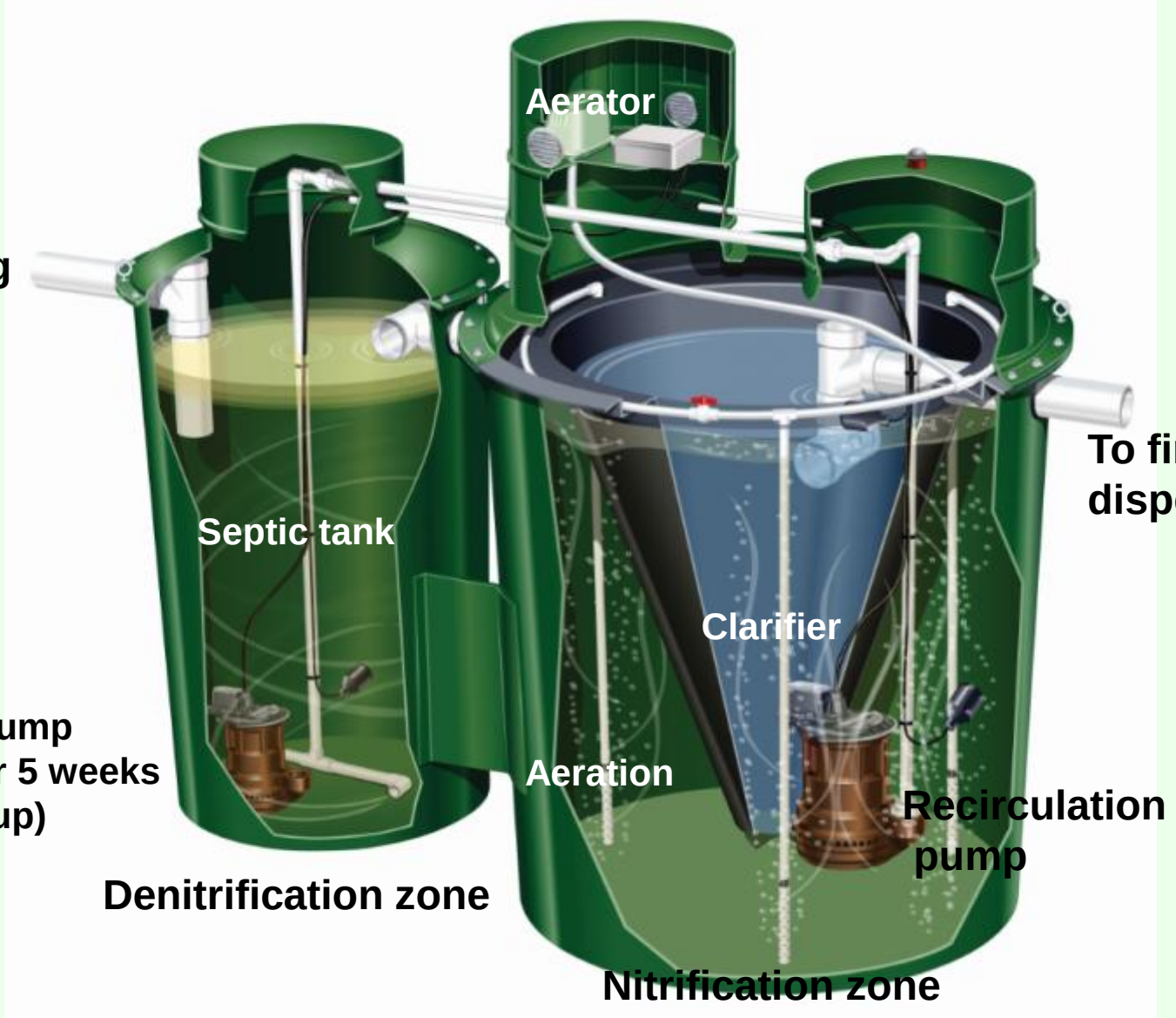
- One tank system: 1,500 gallon (up to 4 bedrooms)
- $167 per/year electrical costs @ $0.17/kWh

Norweco Hydro-Kinetic FEU



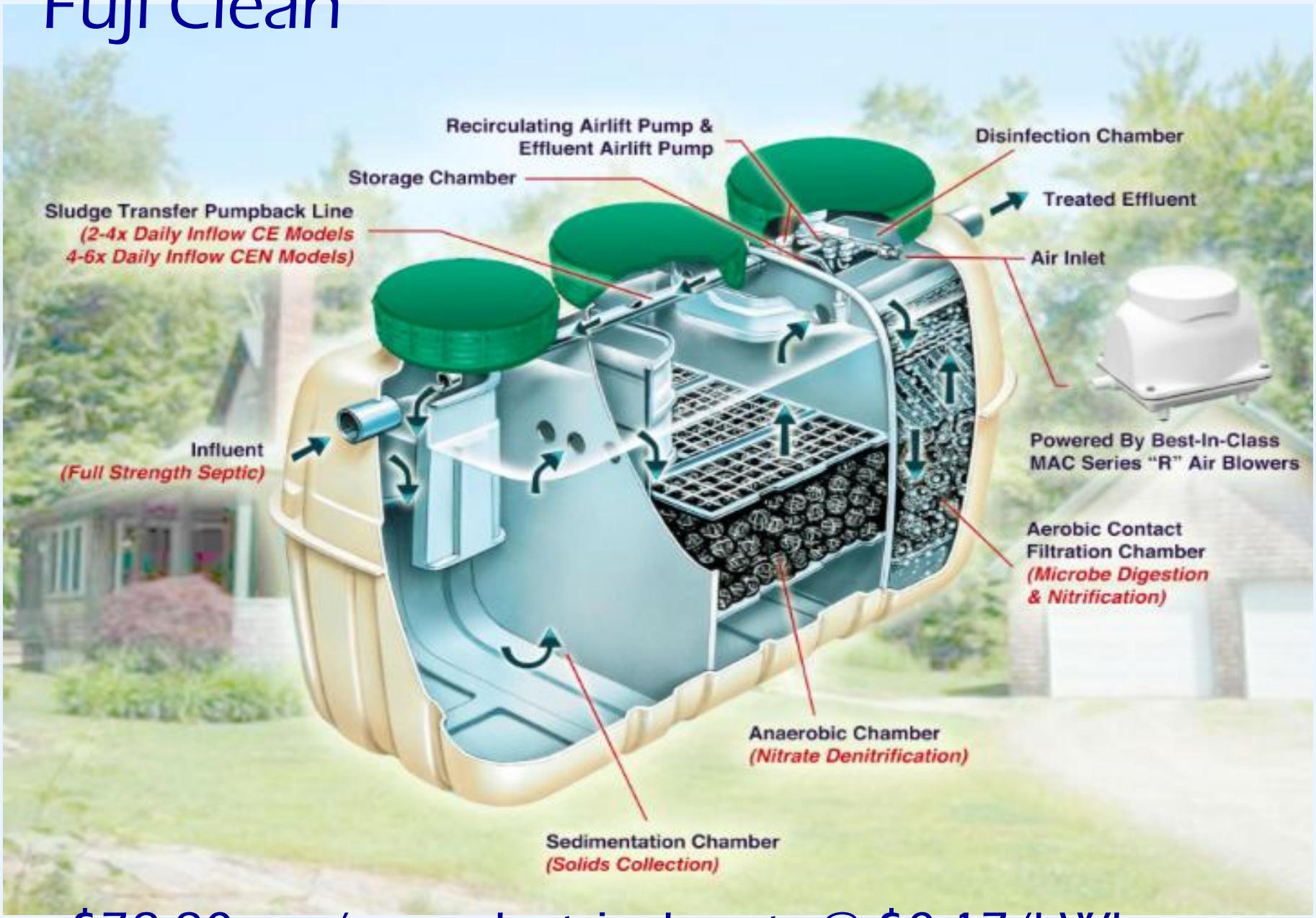
- $178.7 per/year electrical costs @ $0.17/kWh

Hydro-Action Industries AN 500 Series



- $124.82 per/year electrical costs @ $0.17/kWh

Fuji Clean



- $78.80 per/year electrical costs @ $0.17/kWh

Fuji cen Series
During Installation

Example of Concrete Ballast needed due to high groundwater

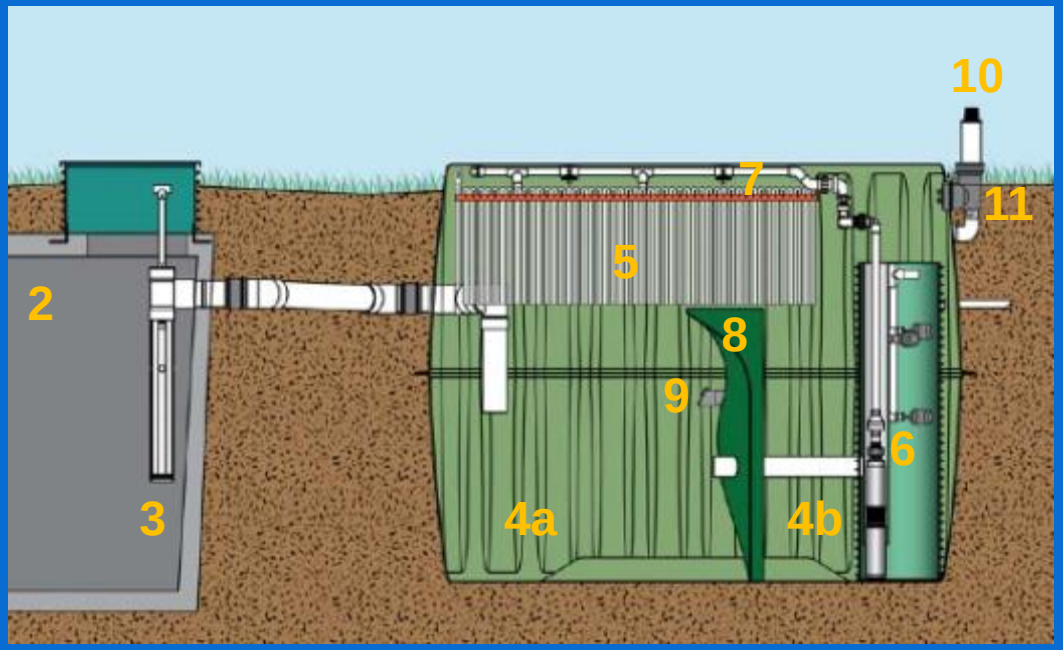
Orenco Systems®
Incorporated

AdvanTex® Overview - AXRT

Main Components

1. Control panel (not shown)
2. Primary tank
3. Biotube effluent filter
4. Treatment tank
   a. recirc / blend chamber
   b. recirc / filtrate chamber
5. AdvanTex textile filter
6. Recirc pumping system
7. Manifold & spin nozzles
8. Tank baffle
9. Recirc-return valve
10. Passive vent
11. External splice box
12. Primary return line (not shown)

Pressure and Timed-dosed media filter



- $57.00 per/year electrical costs @ $0.17/kWh

Control Panels & Air Vents

Septic Improvement Program – Manufacturer Contact Information

For More Information visit www.ReclaimOurWater.info or call (631) 852-5811

Manufacturer & Technology	Local Contact
Norweco Singulair & Hydro-Kinetic	Tom Montalbine, President Roman Stone Construction Company 85 South Fourth Street - Bayshore, NY 11706 Web: www.romanstoneco.com Phone: 631-667-0566 Ext.114 Email: tmontalbine@romanstoneco.com
Hydro-Action	Joe Densieski Wastewater works inc. 139 Reeves ave Riverhead, NY 11901 www.wastewaterworksinc.com (631)831-2580
Fuji Clean System	Bryan McGowin, Advanced Wastewater Solutions, LLC PO BOX 1622 - Southampton ,NY 11969 Email: bmcgowin@gmail.com or bryan@awsli.com 631-405-0358 Peder Larsen, Shelter Island Sand, Gravel, & Contracting PO Box 2028 – Shelter Island, NY 11964 (631) 749-1040 sisandgravel@gmail.com
Orenco AX-RT	Lee Essay, Nugent & Potter 1557 County Rd. 39 – Southampton NY 11968 Phone: 631-283-1103 Email: Lee@nugentpotter.com

Projected 1-Year Electrical Costs

Technology	1 year electrical consumption (kWh/year)	Increased electrical costs per year ($0.17/ kWh)
Orenco Advantex AX20-RT	335.8 kWh	$57.00
Fuji Clean System	463.55 kWh	$78.80
Hydro-Action AN	734.26 kWh	$124.82
Norweco Singulair TNT	979.66 kWh	$167.00
Norweco Hydro-Kinetic	1051.2 kWh	$178.70

Note: the Hydro-Action unit utilizes a mixer pump during start-up. The pump use is discontinued after startup, and usage data will vary after the start-up period.

Septic Improvement Program Notes

- Please see Designer cost ranking document for estimates of I/A OWTS design and permitting costs.
- All prices are estimates from Vendor submitted quotes for 4-bedroom I/A OWTS. Sales tax is not included and may be exempt for capital improvement projects.
- Actual costs may vary based on site constraints. Homeowners are urged to contact Vendors to discuss project specific costs for their Property.
- Grant funding will not exceed $10,000 for I/A OWTS installed with gravity leaching or $11,000 for I/A OWTS installed with PSD.

Use of Grant Funds is Not Allowed For:

- Irrigation repairs
- landscaping
- electrical improvements unrelated to the I/A OWTS

For More Information visit
www.ReclaimOurWater.com
or call (631) 852-5811

Septic Improvement Program – Ongoing Costs

For More Information visit www.ReclaimOurWater.info or call (631) 852-5811

Operations & Maintenance Costs

Technology	One Year Contract Cost
Hydro-Action AN	$250.00
Orenco Advantex AX20-RT	$271.66
Fuji Clean Systems	$250.00
Norweco Hydro-Kinetic	$300.00
Norweco Singulair TNT	$315.00

* Consult manufacturer for additional warranties specific to their systems. All systems in Suffolk County are sold with a three year warranty, but many manufacturers offer additional warranties on pumps and aerators.

** Complete replacement of control panels is rare and usually associated with lightning strikes. Check with your homeowners insurance to see if these repair costs are covered under your policy.

Estimated Repair and Replacement Costs*

Technology	Item	Cost	Life Expectancy
Norweco Singulair TNT	Aerator Replacement	$500.00	10 years
	Control Panel Replacement**	$1,200.00	20 years
Fuji Clean CEN System	Blower Replacement (MAC 80R)	$320.00	10 years
	Blower Replacement (MAC 100R)	$420.00	
	Blower Rebuild	$150.00	
	Float Replacement	$100.00	5-10 years
	Control Panel Replacement**	$400.00	20 years
Hydro-Action AN Series	Blower Replacement	$400.00	10 years
	Blower Rebuild	$100.00	
	Recirculation Pump Replacement	$400.00	10 years
	Float Replacement	$80.00	5-10 years
	Control Panel Replacement **	$1,200.00	20 years
Orenco Advantex AX20-RT	Recirculation Pump Replacement	$800.00	10 years
	Float Replacement	$80.00	5-10 years
	Control Panel Replacement **	$1,500.00	20 years
Norweco Hydro-Kinetic	Blower Replacement	$300.00	10 years
	Blower Rebuild	$100.00	
	Recirculation Pump Replacement	$500.00	10 years
	Control Panel Replacement **	$1,200.00	20 years

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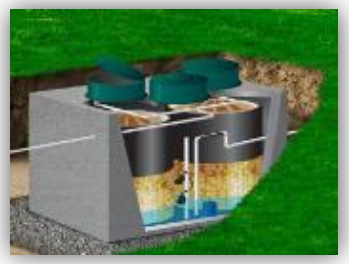
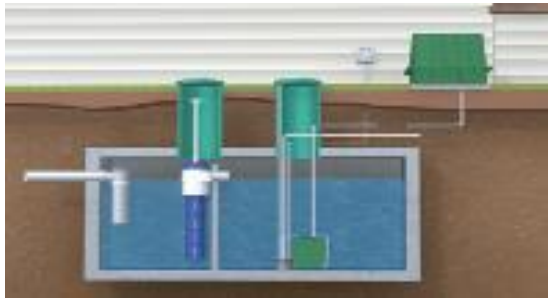
I/A OWTS BEING EVALUATED BY SUFFOLK COUNTY



Waterloo BioFilter

PUGO Systems

BioMicrobics SeptiTech STAAR



BioMicrobics BioBarrier MBR

BUSSE MBR

Orenco Advantex AX-20

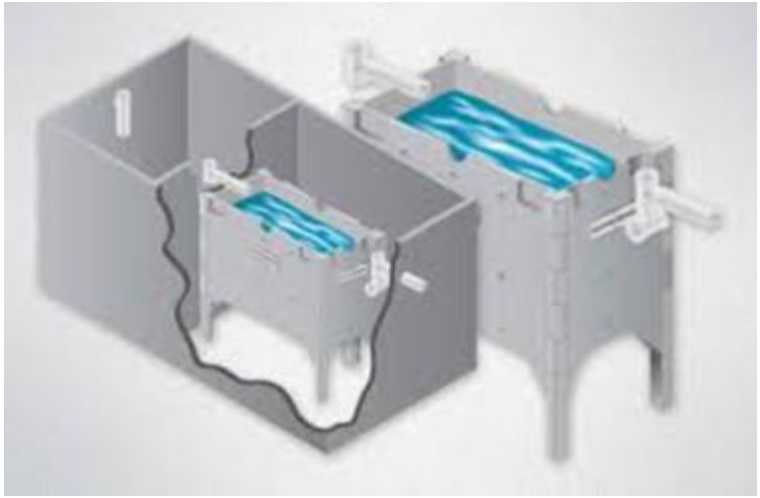
Suffolk County Department of Health Services
Septic Demo Performance Data

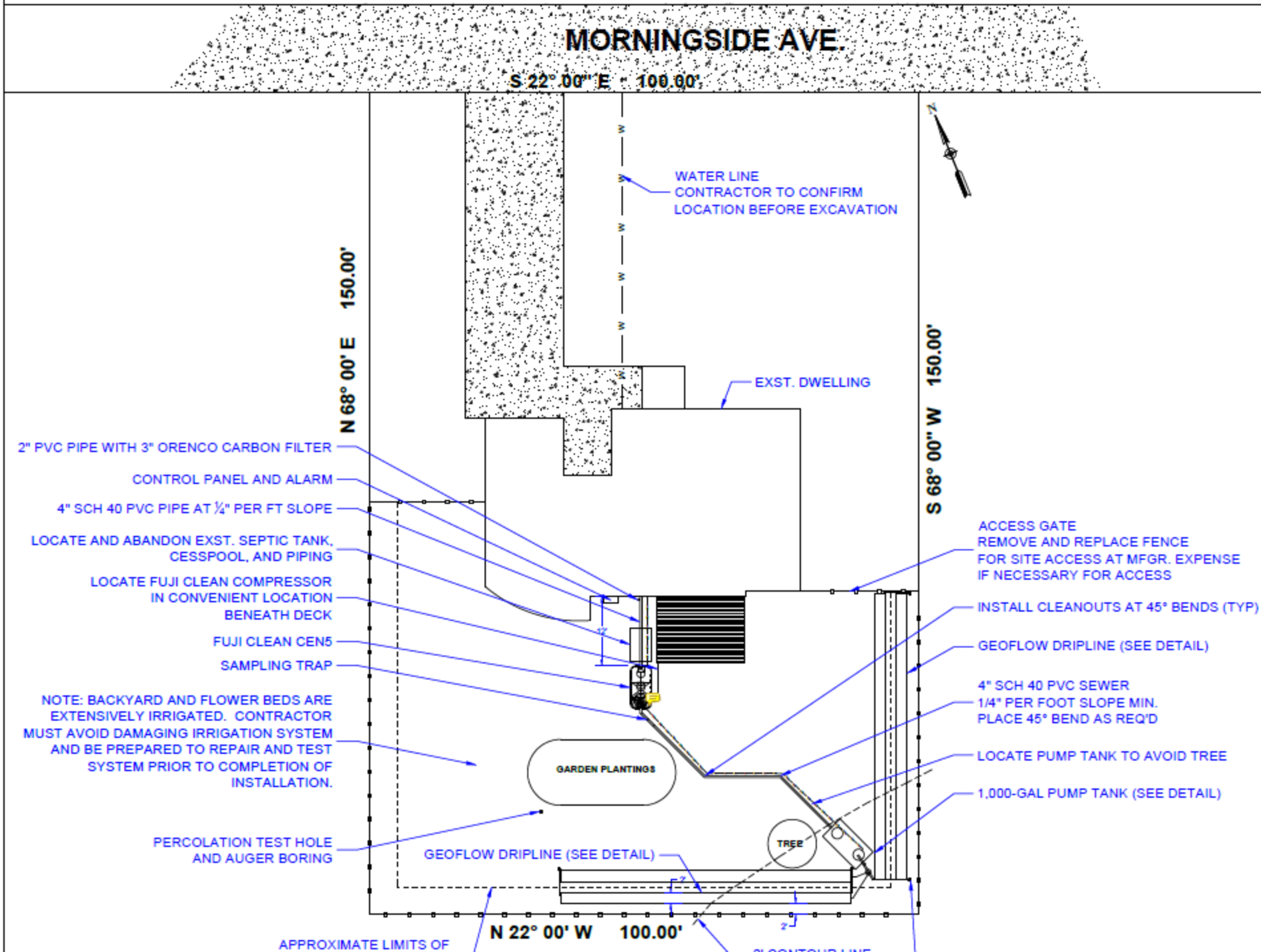
Technology	Projected Approval Data	Treatment Performance *	# of Systems Being Sampled	% Completed
Orenco Advantex – AX20	Summer 2018	17 mg/l	3	77%
Amphidrome	Spring 2019	18.3 mg/L	2	50%
Ecoflow + Denite	Summer 2018	18.8mg/L	2	99%
SepticTech	Summer 2018	13.25 mg/L		58%
Pugo	Cannot Project	33.2 mg/L	4	Manufacturer to make adjustments in 2018
Ecoflow	Cannot project	30.9 mg/L	2	Manufacturer to make adjustments in 2018
Waterloo	Cannot Project	48.0 mg/L	2	Manufacturer to make adjustments in 2018
BioBarrier	Cannot Project	54.0 mg/L	2	Manufacturer to make adjustments in 2018
BUSSE - MF	Cannot Project	83.1mg/l	2	Systems offline. Manufacturer to make adjustments in 2018

*Standard is 19mg/L

List of Approved I/A OWTS

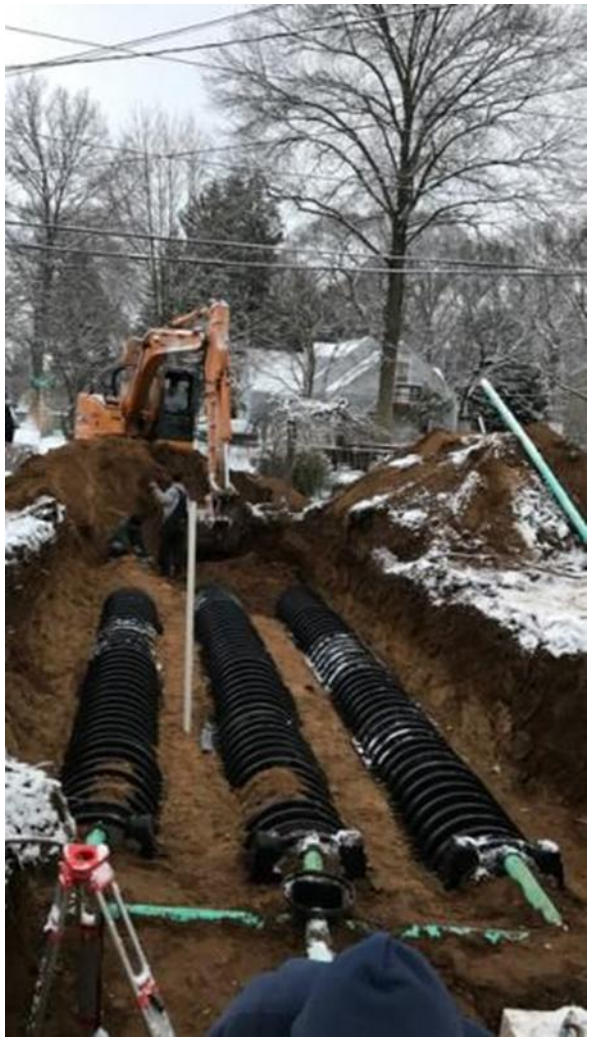
- *Updated periodically (last update 1/19/18)*
- *Experimental Systems:*
  - *Nitrex System (with Orenco, Waterloo Biofilter, or SeptiTech)*
    - ✓ *Nitrex w/ Orenco installed at Scully Estates*
  - *Nitrogen Reducing Biofilter (lined, unlined, or Denite Tank)*
  - *Vegetated Gravel Recirculating Filter (AKA Constructed Wetlands)*
- *Pilot Systems*
  - *ECOPOD-N Series*
- *Provisional Systems*
  - *Hydro-Action AN Series*
  - *Norweco Singulair TNT*
  - *Norweco Hydro-Kinetic*
  - *Orenco AX-RT*
  - *Fuji Clean CEN Series*
- *Septic Demo Pilot Systems*
  - *System currently installed as part of septic demo are not on the list since they cannot be sold until approved for Provisional Use*




MORNINGSIDE AVE.
S 22° 00" E 100.00'
WATER LINE
CONTRACTOR TO CONFIRM
LOCATION BEFORE EXCAVATION
EXST. DWELLING
N 68° 00' E 150.00'
S 68° 00" W 150.00'
2" PVC PIPE WITH 3" ORENCO CARBON FILTER
CONTROL PANEL AND ALARM
4" SCH 40 PVC PIPE AT ¼" PER FT SLOPE
LOCATE AND ABANDON EXST. SEPTIC TANK, CESSPOOL, AND PIPING
LOCATE FUJI CLEAN COMPRESSOR IN CONVENIENT LOCATION BENEATH DECK
FUJI CLEAN CEN5
SAMPLING TRAP
NOTE: BACKYARD AND FLOWER BEDS ARE EXTENSIVELY IRRIGATED. CONTRACTOR MUST AVOID DAMAGING IRRIGATION SYSTEM AND BE PREPARED TO REPAIR AND TEST SYSTEM PRIOR TO COMPLETION OF INSTALLATION.
PERCOLATION TEST HOLE AND AUGER BORING
ACCESS GATE
REMOVE AND REPLACE FENCE FOR SITE ACCESS AT MFGR. EXPENSE IF NECESSARY FOR ACCESS
INSTALL CLEANOUTS AT 45° BENDS (TYP)
GEOFLOW DRIPLINE (SEE DETAIL)
4" SCH 40 PVC SEWER
1/4" PER FOOT SLOPE MIN.
PLACE 45° BEND AS REQ'D
LOCATE PUMP TANK TO AVOID TREE
1,000-GAL PUMP TANK (SEE DETAIL)
GARDEN PLANTINGS
TREE
GEOFLOW DRIPLINE (SEE DETAIL)
2'
2'
N 22° 00' W 100.00'
APPROXIMATE LIMITS OF

Open Bottom Gravelless Absorption Trenches

- Designed based on Perc Rate
- Designed based on 2ft wide trenches
- Products designed based on following are permitted 25% reduction compared to standard 2ft wide trench
  - Bottom area of 1.6 sf/lf
  - Min. Volume of 7.5 gal/lf
  - Open sidewall
- Placed in row w/ 4ft between rows
- Example: Infiltrator or Cultec Chambers

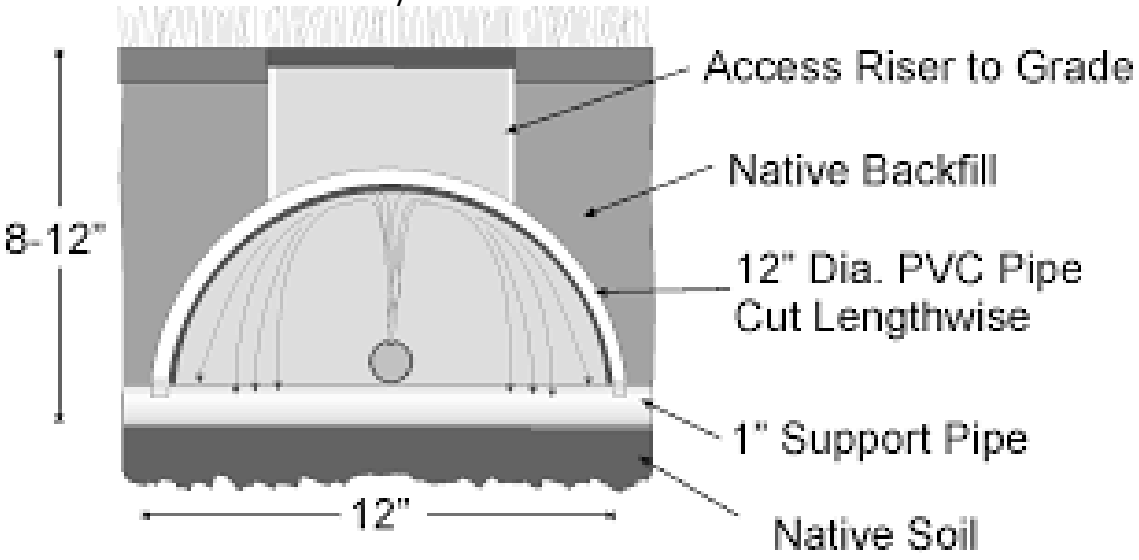


Gravelless Geotextile Sand Filter

- Designed based on Perc Rate
- Designed based on 2ft wide trenches
- Products designed based on following are permitted to be designed based on 6 sq/lf compared to standard 2ft wide trench (See NYSDOH "Residential Onsite Wastewater Treatment System Design Handbook", Appendix C List)
  - Width 3ft
  - Min. Storage of 12 gal/lf
  - Min 6sf/lf geotextile surface/lf
- Placed in row w/ 4ft between rows
- Example: Eljen, Geomat, Infiltrator ATL

PRESSURIZED SHALLOW DRAINFIELDS (PSDS)

- Pressurized drainfields that evenly and horizontally distribute treated effluent within 18 inches of the top soil horizon.
- Emphasis on increased microbial activity and nutrient absorption.
- Req. duplex pumps unless system designed to flow by gravity on pump failure
- Must follow I/A OWTS



APPLICATIONS FOR RETROFIT ("BEST-FIT" RESIDENTIAL EXAMPLE)

- **Retrofit or Replacement** of an **existing sewage disposal system with an I/A** OWTS shall meet the Standards to the greatest extent possible.
- If necessary, certain requirements may be relaxed at the discretion of the Department provided:
  - ✓ **A change of use, building renovation or any increased flow to the OWTS is not proposed.**
  - ✓ The protection of public health and the environment is given priority of all other considerations.
  - ✓ The proposed system does not reduce the setbacks to neighboring private wells as compared to the current system being replaced or retrofitted.
  - ✓ The Design Professional certifies that the retrofit application meets the Standards to the greatest extent possible and that other alternatives are not feasible.
- The Department may allow an OWTS Application for Retrofit to be submitted when a fire or other catastrophic occurrence necessitates that a structure served by an OWTS be replaced.

REGISTER ONLINE AND ACTIVATE YOUR ACCOUNT

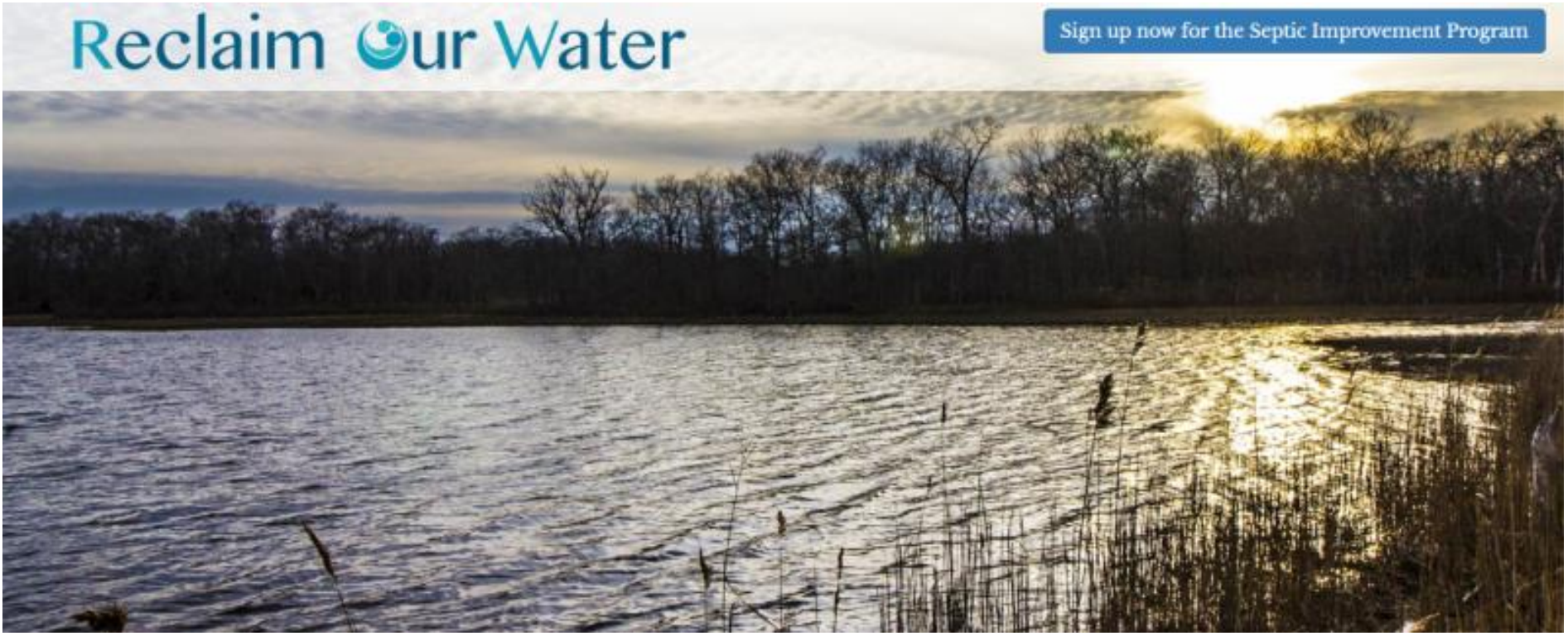
Septic Improvement Program (SIP)

Grant Program Details:

- Individual homeowners may be eligible for a grant up to $11,000.
- $10,000 will be provided toward the purchase and installation of an approved I/A OWTS and leaching structure, as well as for attendant engineering and design services.
- An additional $1,000 may be available for installation of Pressurized Shallow Drainfield for a maximum grant of up to $11,000.

Income Criteria:

- Adjusted Gross Income less than or equal to $300,000/year is eligible for 100% of grant
- Adjusted Gross Income between $300,000/year - $500,000/year is eligible for 50% of grant
- Adjusted Gross Income of $500,000 or more will not be eligible for a grant (consistent with NYS Star Property Tax Rebate).



Questions?

John Sohngen, P.E., Principal Public Health Engineer

or

Justin Jobin, Environmental Projects Coordinator

631-852-5811