

Shelter Island Wastewater Management Project

Report Addendums

**Shelter Island Town Board
Progress Report
March 21, 2023**

Environmental Engineers/ Consultants

LOMBARDO ASSOCIATES, INC.

188 Church Street

Newton, Massachusetts 02458

53 Hill Street, Southampton, NY 11968

Addendum # 1

Evaluation of Individual On-Site & On-Site / Small Community Options

1. Preliminary Engineering Sizing and Layouts Prepared
 - a. Setback Variances Required for 4 properties

Shelter Island Center Municipal Wastewater Treatment Project - Individual Systems Required Variances			
Parcel #	Parcel Use	WW Flow (gpd)	Required Variances
1	Public Library	860	10-ft property line reduced to 8-ft
2	Fire Depart Center Fire House	264	No Variances Required
3	Town Youth Center / American Legion Hall (multi-purpose facility)	2,538	No Variances Required
4	Town Assessors + Tax Receivers Office	333	75-ft to residential property line reduced to 35-ft;
	Town Hall		150-ft well to disposal reduced to 81-ft
	Building + Engineering Depart.		75-ft well to treatment system reduced to 70-ft
5	Town-owned residential housing	900	No Variances Required
6	Police Depart. HQ	206	75-ft to residential property line reduced to 60-ft; 150-ft well to disposal reduced to 125-ft
7	Justice Court Building	152	100-ft well to treatment reduced to 75-ft; 150-ft well to disposal reduced to 75-ft
(1)	Add'l Required Variances may be required due to water supply well concerns		
SFR = Single Family Residence			

Addendum # 1

Evaluation of Individual On-Site & On-Site / Small Community Options

- 1. Preliminary Engineering Sizing and Layouts Prepared**
 - a. Cost Estimates Received from Vendors**
 - b. No performance guarantees offered**

- 2. Support efforts to SEQRA Analysis**
 - a. Institutional Structure – Town Board Owner / Applicant**
 - i. Intermunicipal Agreements with School, Library & Fire District needed**
 - b. WWTP Ops Building Façade**
 - c. Energy Use ~ 1,500 kwhr/month. Solar Canopy will be investigated during design**
 - d. Truck Traffic ~ 25 trucks for major equipment over ~ 4-5 months**
 - e. Trees along Route 114 – none are to be removed**

Addendum # 1 – Continued

Preliminary Construction Schedule

Shelter Island Wastewater System - Preliminary Design, Permitting & Construction Schedule							
Months After Authorization to Proceed	1	3	5	7	9	11	13
Activity Description / Month*	May-23	Jul-23	Sep-23	Nov-23	Jan-24	Mar-24	May-24
	Design, Permitting & Bid Period Activities						
Design	■	■	■	■			
Construction Permitting				■	■	■	
Bid Period						■	■
Months After Authorization to Proceed	15	17	19	21	23	25	28
Activity Description / Month*	Jul-24	Sep-24	Nov-24	Jan-25	Mar-25	May-25	Aug-25
	Construction Activities						
Construction Contract / Mobilization	■	■					
Route 114 & Manwaring Rd Collection System		■	■	■	■	■	
16 Manwaring Rd Tree Clearing				■	■		
Wastewater Treatment & Disposal System					■	■	■
Months After Authorization to Proceed	29	31					
Activity Description / Month*	Sep-25	Nov-25					
Property Connections & Existing Systems Abandonment	■	■					

Assumes Authorization to Proceed Issued by May 1, 2023

Addendum # 2

Impact Evaluation of Current Discharges & Proposed Discharge on Near By Water Supply & Irrigation Wells & Gardners Creek

Addendum # 2

All data for analysis from 2020 & 2021 U.S. Geological Survey Reports – Public Information

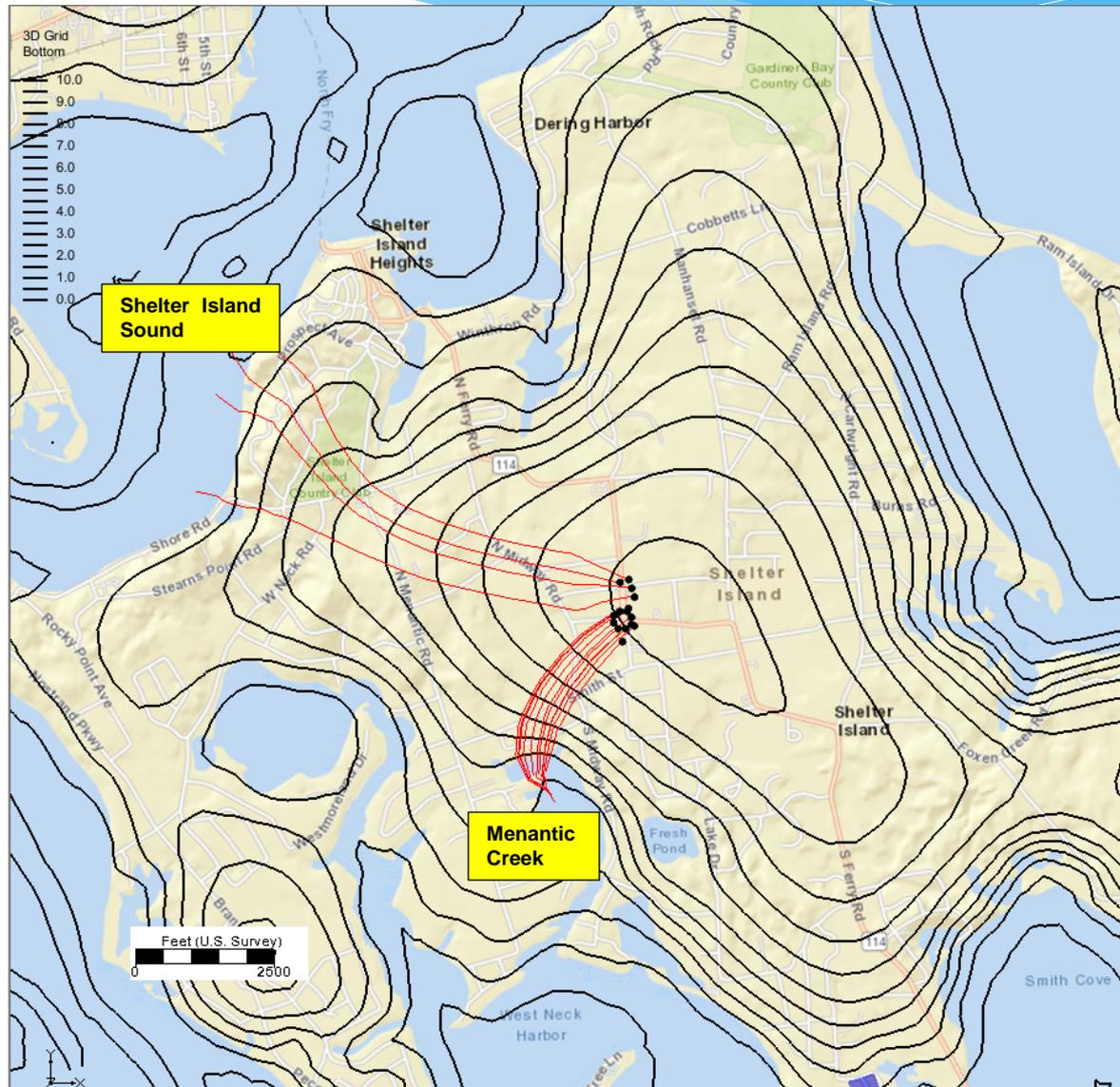
Walter, D.A., Masterson, J.P., Finkelstein, J.S., Monti, J., Jr., Misut, P.E., and Fienen, M.N., 2020, **Simulation of groundwater flow in the regional aquifer system on Long Island, New York, for pumping and recharge conditions** in 2005–15: U.S. Geological Survey Scientific Investigations Report 2020–5091, 75 p., <https://doi.org/10.3133/sir20205091>

“Misut, P.E., Casamassina, N.A., and Walter, D.A., 2021, **Delineation of areas contributing groundwater and travel times to receiving waters in Kings, Queens, Nassau, and Suffolk Counties, New York**: U.S. Geological Survey Scientific Investigations Report 2021–5047, 61 p.”, <https://doi.org/10.3133/sir20215047>.

with associated data from

“Misut, P.E., 2021, **MODFLOW-NWT and MODPATH6 used to delineate areas contributing groundwater and travel times to receiving waters of Kings, Queens, Nassau, and Suffolk Counties, New York**: U.S. Geological Survey data release”, <https://doi.org/10.5066/P9DKILJY>.

Impact Evaluation of Current Discharges



Impact Evaluation of Current Discharges

Shelter Island Center Municipal Wastewater Treatment Project	Design Flow (gpd)		Average Actual Flow (gpd)		WW TN (mg/L)	Avg. Flow WW TN to GW (lbs./year)	
	Existing	Potential Future	Existing	Potential Future		Existing	Potential Future
Police Depart. HQ	206	206	103	103	150	35	35
Justice Court Building	152	152	76	76	150	26	26
Fire Depart Center Fire House	264	264	132	132	150	45	45
Town-owned residential housing	675	1,200	338	600	65	50	89
Shelter Island Sound Discharge	1,297	1,822	649	911		157	196
Town Youth Center / American Legion Hall (one facility with multiple purposes)	2,538	2,538	1,269	1,269	150	435	435
Town Assessors + Tax Receivers Office Bldg.	333	333	166	166	150	57	57
Town Hall							
Other Building							
Public Library	535	860	268	430	150	92	147
School	1,980	1,980	990	990	150	339	339
Menantic Creek Discharge	5,386	5,711	2,693	2,855		922	978
Subtotal	6,683	7,533	3,341	3,766		1,079	1,173
Contingency	317	467	159	234	150	54	80
Total	7,000	8,000	3,500	4,000		1,133	1,253
Notes:	gpd = gallons per day		mg/L = milligrams per liter = parts per million				
1) Average flow = 50% of design flow.	WW = Raw wastewater		TN = Total Nitrogen		GW = Groundwater		
2) 25% WW TN removal in soil, therefore 75% to groundwater							

Travel Time

Shelter Island Sound

- > 100 years

Menantic Creek

- 33 years

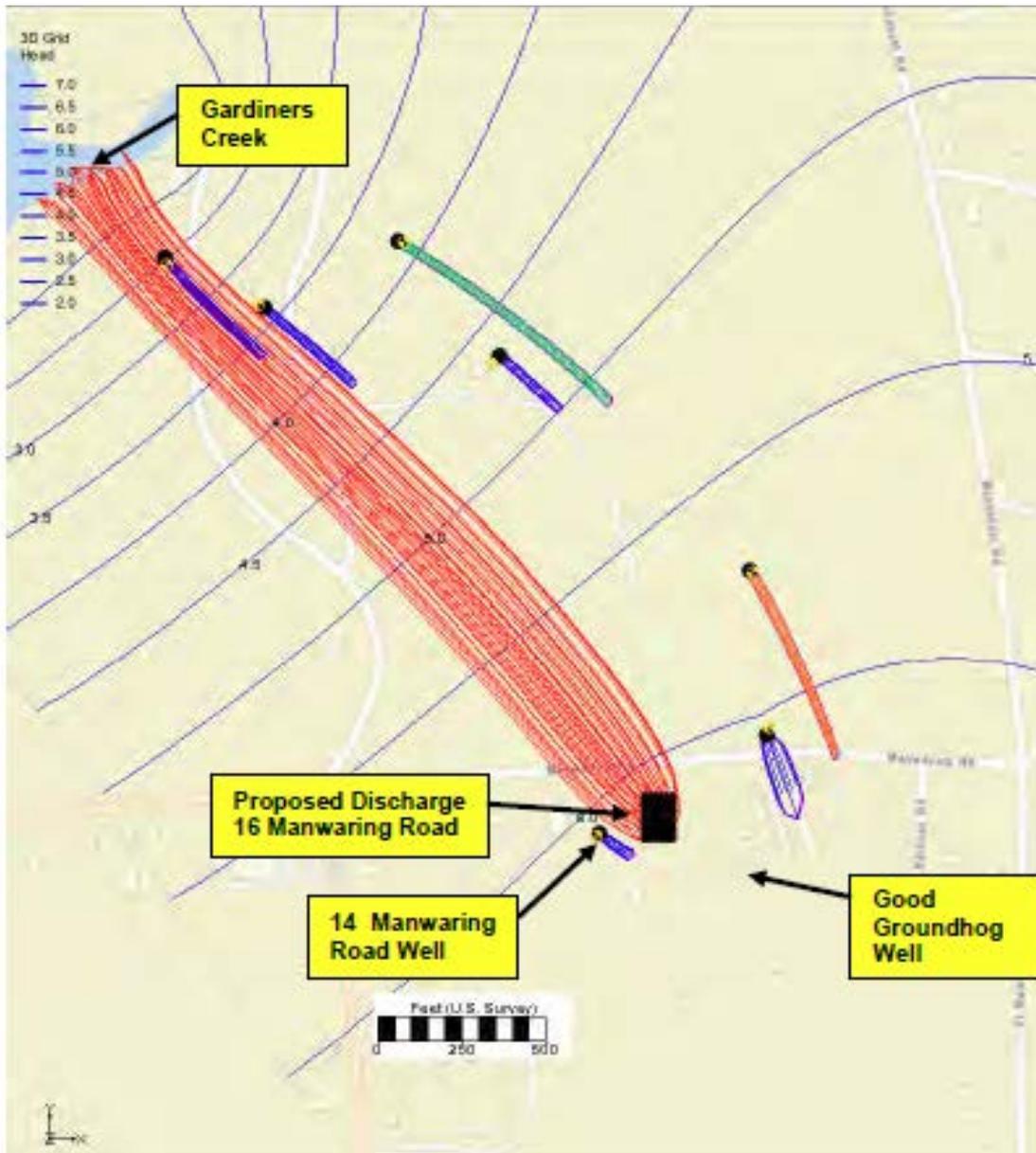
Impact Evaluation of Removing Current Discharges

	Town Properties	Proposed Discharge WW TN to GW		Net Reduction of WW TN to GW (lbs./year)	
	Avg. Flow WW TN to GW (lbs./year)	Avg. Flow (4,000 gpd)	Design Flow (8,000 gpd)	Avg. Flow (4,000 gpd)	Design Flow (8,000 gpd)
Existing Conditions	1,133	27	54	1,106	1,079
Future Potential	1,253	27	54	1,226	1,199

Impact of Proposed 4,000 gpd Discharge on Neighboring Wells



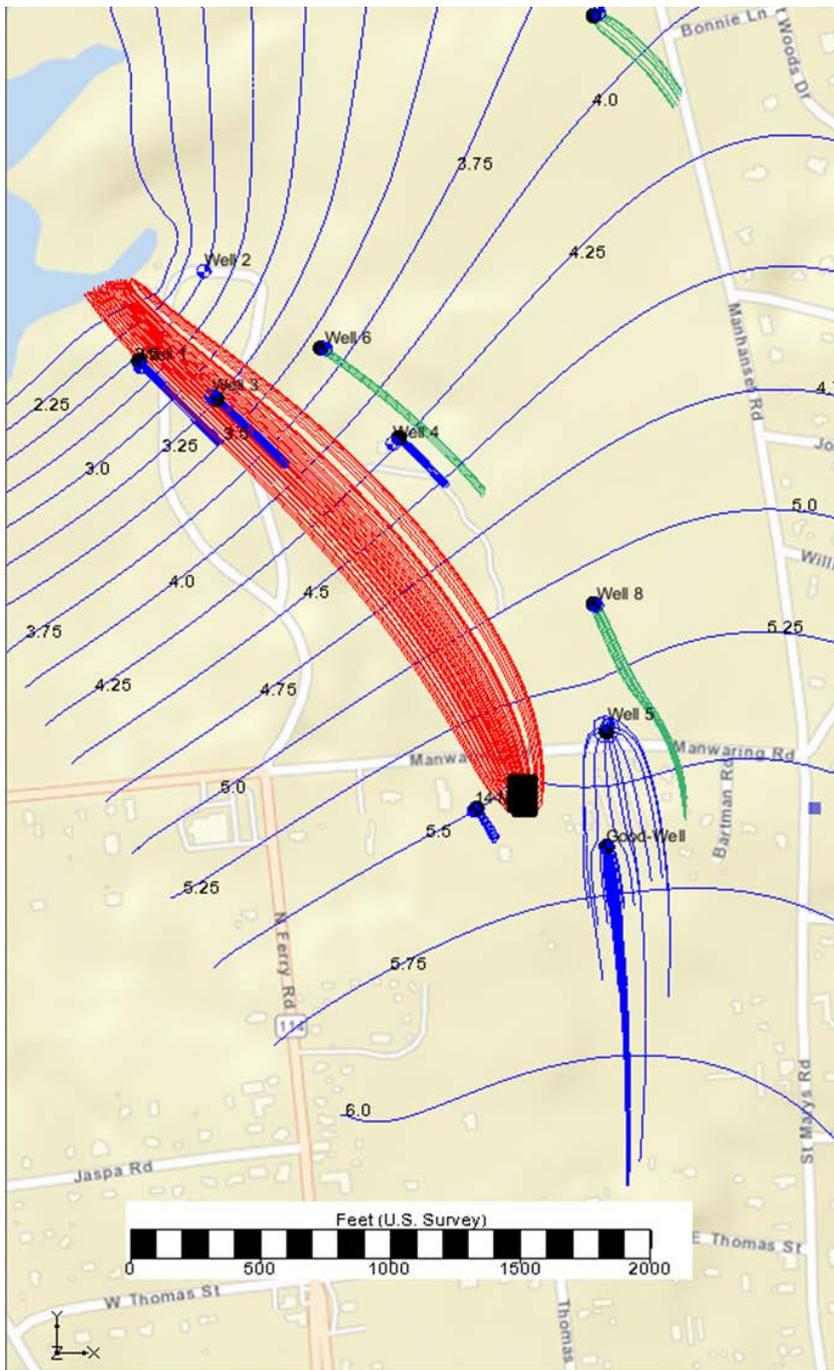
- Green Particle paths on Figures 3-1 and 3-2 are the deeper Sylvester Manor (SM) wells
- Particle paths of 14 and 18 Manwaring Road wells are cross gradient and upgradient of proposed wastewater discharge respectively
- Particle Paths to wells and from discharge overlap but do not intersect
- Time of Travel is approximately 21 to 24 years.



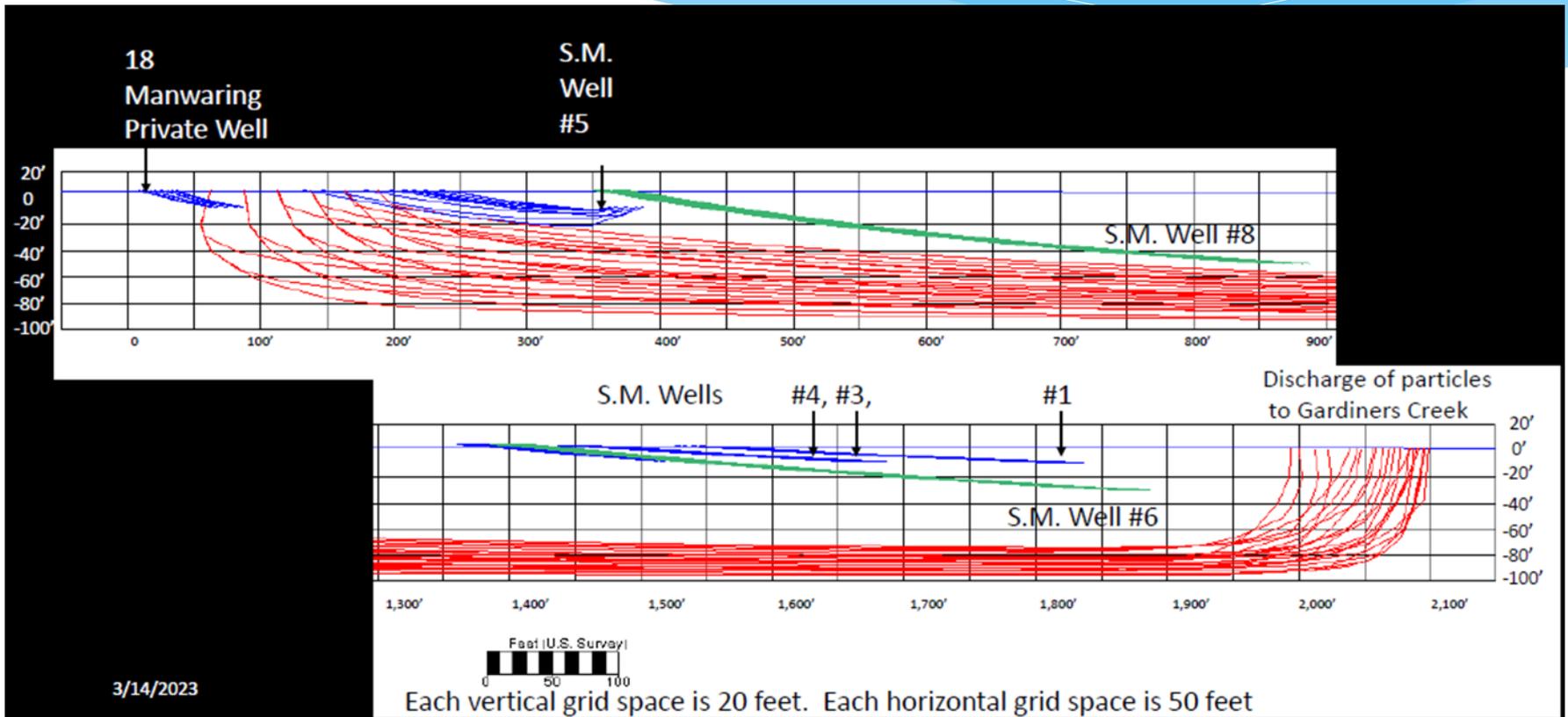
Impact of Proposed Discharge 8,000 gpd on Neighboring Wells

Transient Conditions -Pumping for 3 Summer months without Recharge

- ✓ Pumping Rates are at the Annual Average Volume over 3 months instead of 12 months for the Irrigation Wells
- ✓ Pumping Rate for Domestic Wells is at 300 GPD
- ✓ Particles to wells do not intersect the 8,000 GPD Discharge



Cross Sections of Well Recharges & Proposed Discharge – 8,000 gpd

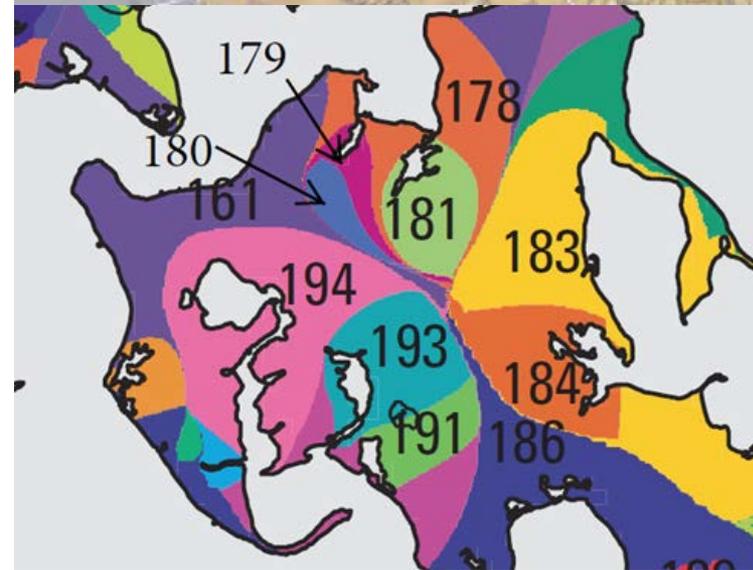
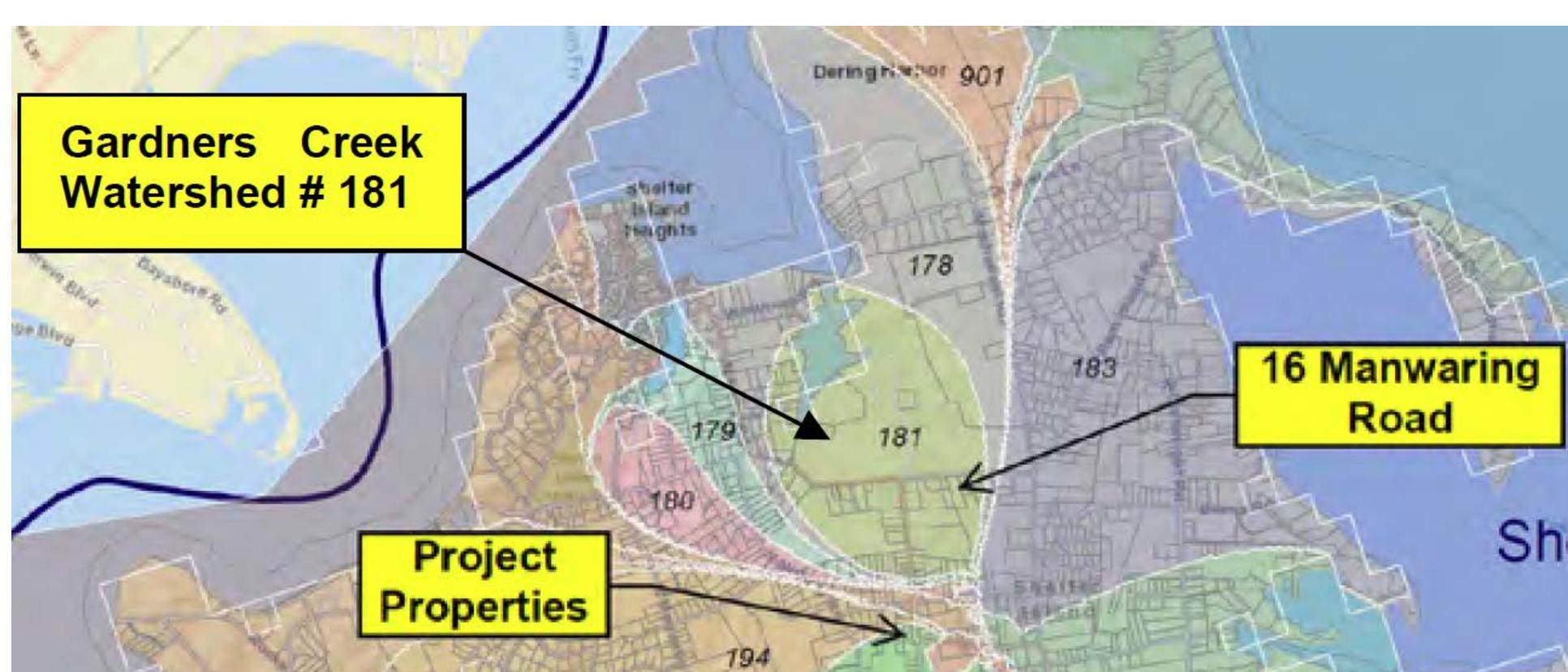


**Gardners Creek
Watershed # 181**

**16 Manwaring
Road**

**Project
Properties**

**Impact of
Proposed
Discharge on
Gardners Creek**



Impact of Proposed Discharge on Gardners Creek

#	SUB SHED #	LU_DESC	Avg. Res. WW Flow (gpd)	Avg. Non-Res. WW Flow (gpd)	Avg. WW Flow (gpd)	N Conc. (mg/L)	N LOAD to DF (lb/yr)	N LOAD to GW (lb/yr)	YEAR BUILT	# BLD	# BEDS	Parcel Area (sf)	LOCATION	OWNER
1	181	1 Family Res	220		220	65	44	33	1800	2	4	99,717	140 N Ferry Rd	Timothy Haynes
2	181	1 Family Res	200		200	65	40	30	1847	4	3	88,739	105 N Ferry Rd	George Schultheis
3	181	1 Family Res	275		275	65	54	41	1851	1	5	91,975	116 N Ferry Rd	Wigland116, LLC
4	181	1 Family Res	200		200	65	40	30	1880	1	3	79,998	82 N Ferry Rd	Todd Williamson
5	181	1 Family Res	220		220	19	13	10	1900	3	4	50,755	18A Manwaring Rd	Andrew J. Steinmuller
6	181	1 Family Res	220		220	65	44	33	1900	2	4	21,757	54 N Ferry Rd	Dawn Hedberg
7	181	1 Family Res	200		200	65	40	30	1920	1	2	14,746	142E N Ferry Rd	Christopher Coulson
8	181	1 Family Res	200		200	65	40	30	1925	1	2	12,184	142L N Ferry Rd	Elizabeth H. Nardin
9	181	1 Family Res	200		200	65	40	30	1925	5	3	18,056	52 N Ferry Rd	William McGuire
10	181	1 Family Res	200		200	65	40	30	1925	1	3	24,546	56 N Ferry Rd	Joseph Avona Jr
11	181	1 Family Res	220		220	65	44	33	1926	2	4	44,024	91 N Ferry Rd	Louis Katsos
12	181	1 Family Res	220		220	65	44	33	1930	4	4	22,545	58 N Ferry Rd	Christopher J. Coyne
13	181	1 Family Res	220		220	65	44	33	1935	2	4	11,262	142J Hedges Rd	The Nature Conservancy
14	181	1 Family Res	200		200	65	40	30	1938	2	3	23,932	89 N Ferry Rd	Charles Magill
15	181	1 Family Res	200		200	65	40	30	1940	2	2	21,778	95 N Ferry Rd	Mary C. Chobor
16	181	1 Family Res	200		200	65	40	30	1950	2	2	17,886	142F N Ferry Rd	Gail F. Staal
17	181	1 Family Res	200		200	65	40	30	1954	1	1	30,010	6 Jaspa Rd	George J. Hoffmann
18	181	1 Family Res	200		200	65	40	30	1955	2	3	30,479	8 Jaspa Rd	Beatrice Silvani
19	181	1 Family Res	200		200	65	40	30	1956	2	3	30,045	4 Jaspa Rd	Stanley C. Beckwith
20	181	1 Family Res	200		200	65	40	30	1972	2	3	50,607	111 N Ferry Rd	Laura Gentile
21	181	1 Family Res	275		275	65	54	41	1973	1	5	39,193	13A E Thomas St	Russell W. Smith
22	181	1 Family Res	200		200	65	40	30	1976	2	3	62,314	97 N Ferry Rd	Robert Reylek
23	181	1 Family Res	220		220	65	44	33	1987	1	4	14,661	142H N Ferry Rd	Sarah Tobin
24	181	1 Family Res	220		220	65	44	33	1988	1	4	43,981	93 N Ferry Rd	Loudon S. Wainwright III
25	181	1 Family Res	200		200	65	40	30	1990	2	3	79,257	148E N Ferry Rd	Eleanor Oakley
26	181	1 Family Res	200		200	65	40	30	1995	2	2	54,309	142G N Ferry Rd	Karen Feuer
27	181	1 Family Res	220		220	65	44	33	2004	1	4	92,109	14 Manwaring Rd	Christian E. Johnson
28	181	1 Family Res	200		200	65	40	30		1	0	45,730	8 Manwaring Rd	8 Manwaring LLC
29	181	Residential	200		200	150	91	69		2	0	50,986	71 N Ferry Rd	71 North Ferry Road, LLC
30	181	Cottages	1,800		1,800	65	356	267		14	0	454,955	62 N Ferry Rd	Cards Cabins, LLC

Impact of Proposed Discharge on Gardners Creek

#	SUB SHED #	LU_DESC	Avg. Res. WW Flow (gpd)	Avg. Non-Res. WW Flow (gpd)	Avg. WW Flow (gpd)	N Conc. (mg/L)	N LOAD to DF (lb/yr)	N LOAD to GW (lb/yr)	YEAR BUILT	# BLD	# BEDS	Parcel Area (sf)	LOCATION	OWNER
31	181	Cottages	200		200	19	12	9		7	0	62,245	18 Manwaring Rd	Happy Groundhog LLC
32	181	Dealer-prod.	0	150	150	150	69	51		2	0	73,817	74 N Ferry Rd	White Oak Estates, LLC
33	181	Diner/lunch	0	500	500	100	152	114		1	0	55,617	63 N Ferry Rd	CCAK Holdings, LLC
34	181	Health bldg	0	150	150	150	69	51		1	0	21,782	12 Manwaring Rd	Town of Shelter Island
35	181	Media studio	0	0	0	150	0	0			0	4,826	52A N Ferry Rd	George G. Zeigler
36	181	MiniWhse SelfSto	0	150	150	150	69	51		4	0	50,003	20 Manwaring Rd	Charles R. Gulluscio
37	181	Mtor veh srv	0	150	150	150	69	51		1	0	10,191	55B N Ferry Rd	George W. Hubbard Jr
38	181	Nbh shop ctr	0	150	150	150	69	51		1	0	20,202	57 N Ferry Rd	C & C Enterprises Ltd
39	181	Prof. bldg.	0	150	150	150	69	51		2	0	20,629	59 N Ferry Rd	Marc S. Wein
40	181	Res vac land	0		0		0	0		1	0	29,555	2 Jaspa Rd	Selina M. Hunt
41	181	Res vac land	0	0	0		0	0			0	53,612	9A E Thomas St	Antonio V. Medeiros
42	181	Res vac land	0	0	0		0	0			0	40,001	69 N Ferry Rd	Beth L. King Rev. Living Trust
43	181	Res vac land	0	0	0		0	0			0	510,933	80 N Ferry Rd	Eben F. Ostby
44	181	Res vac land	0	0	0		0	0			0	33,317	10 Manwaring Rd	Town of Shelter Island
45	181	Restaurant	0	300	300	85	78	58		5	0	72,762	87 N Ferry Rd	Robert Reiter
46	181	Restaurant	0	300	300	85	78	58		1	0	13,333	85 N Ferry Rd	85 North Ferry Road LLC
47	181	Restaurant	0	300	300	85	78	58		1	0	9,878	55A N Ferry Rd	George W. Hubbard Jr
48	181	Special farm	0	300	300	85	78	58	1830	8	0	6,041,915	80 N Ferry Rd	Sylvester Manor Educational Farm, Inc.
49	181	Supermarket	0	550	550	85	142	107		1	0	228,792	75 N Ferry Rd	GNP Properties, LLC
50	181	Underwtr Ind	0		0		0	0			0	1,094,728	Underwater Land	Town of Shelter Island
51	181	Vac w/imprv	0		0		0	0		1	0	135,600	6 Manwaring Rd	SI Barn LLC
52	181	Vac w/imprv	0		0		0	0			0	44,669	4 Manwaring Rd	SI Corner LLC
53	181	Vacant Land	0		0		0	0			0	231,263	68 N Ferry Rd	Town of SI/County of Suffolk
54	181	Vacant Land	0		0		0	0			0	53,630	16 Manwaring Rd	Town of Shelter Island
55	181	Vacant Land	0		0		0	0			0	211,751	118 N Ferry Rd	Town of Shelter Island
56	181	Warehouse	0		0		0	0			0	26,180	67 N Ferry Rd	Robert Marcello
Totals					11,280		2,619	1,964						

DF = Drainfield/Leaching Pools

Avg WW Flow = 50% of Code Flow

Impact of Proposed Discharge on Gardiners Creek

Totals	WW Flows (gpd)	WW Flows as % of Total	N LOAD to DF (lb/yr)	N LOAD to GW (lb/yr)	N LOAD to GW as % of Total
Residential	8,130	72%	1,603	1,202	61%
Non-Residential	3,150	28%	1,017	762	39%
	11,280	100%	2,619	1,964	100%

Gardiners Creek Wastewater Only Nitrogen Mass Loadings - Existing + Proposed							
Existing	WW TN (lbs./year)	2,619		SFR - Conv. Septic	SFR I/A Septic	SFR Conv to I/A Septic	
	TN to GW (lbs./year)	1,964					
	TN to GW (kg/day)	2.4					
Proposed	16 Manwaring Discharge	Design	Average	Single Family Residence (SFR)			
	Flow (gpd)	8,000	4,000		200	200	
	Effluent TN (mg/L)	3	3		65	19	
	Soils Reduction	25%	25%		25%	25%	
	TN to GW (lbs./year)	54.8	27.4		29.7	8.7	21.0
	TN to GW (kg/year)	24.9	12.5		13.5	3.9	9.5
	TN (lbs./year) to GW as % of Existing WW TN (lbs./year)	2.8%	1.4%				
	TN to GW as Equivalent # of SFR	1.8	0.9				
	TN to GW as Equivalent # of I/A	6.3	3.2				
	TN to GW as Equivalent # of converted Conv. to I/A SFR	2.6	1.3				
Notes:	gpd = gallons per day		mg/L = milligrams per liter		lpd = liters per day		
	WW = Raw wastewater		TN = Total Nitrogen		GW = Groundwater		
1) Average flow = 50% of design flow.							
2) 25% WW TN removal in soil, therefore 75% to groundwater							

Impact of Proposed Discharge on Gardiners Creek

Gardiners Creek Wastewater Only Estimated Groundwater Nitrogen Concentrations - Existing + Proposed		
Watershed Groundwater Flow (gpd)	452,390	from USGS, 2021
Watershed Groundwater Flow (Lpd)	1,712,482	from USGS, 2022
Estimate - Avg. Existing GW WW TN (mg/L)	1.428	Note (2)
Water Quality (WQ) TN Target (mg/L)	0.36	From TMDL studies ⁽¹⁾
Existing GW TN as % of WQ Target	397%	←
16 Manwaring Discharge	Design	Average
Change in GW TN (mg/L) ⁽²⁾	0.040	0.020
Proposed as % of Existing GW TN	2.8%	1.4%
Existing GW TN as % of GW TN Target	11%	6%
<p>Notes: 1. The water quality TN target is the surface water quality target that has been established in numerous watershed TMDL studies on Suffolk County (see https://www.suffolkcountyny.gov/Departments/Health-Services/Environmental-Quality/Water-Resources/Comprehensive-Water-Resources-Management-Plan) and Cape Cod / SE Massachusetts (https://www.mass.gov/guides/the-massachusetts-estuaries-project-and-reports) that cannot be exceeded to achieve water quality standards.</p> <p>2. The change in GW TN concentration in mg/L is calculated by dividing the annual TN loading from Table 4-2 (in mg=1,000,000 *kg) by the aquifer's annual flushing volume of 625,055,800. Liters.</p>		

Impact of Proposed Discharge on Gardiners Creek

- Existing wastewater nitrogen discharges cause estimated average groundwater TN concentrations to far exceed expected TMDL TN budgets requirements by a factor of ~ 3, when wastewater TN is the only considered TN source.
- Likely that all Gardiners Creek wastewater discharges would need to reduce their TN discharges to < 10 mg/L, regardless of proposed discharge
- Proposed average discharge would add 1.4% GW TN of existing discharges
- No impact on neighboring properties water supply wells nor the downgradient wells as the discharge will not intercept the well recharges

Questions / Discussion

Environmental Engineers/ Consultants

LOMBARDO ASSOCIATES, INC.

188 Church Street

Newton, Massachusetts 02458

www.LombardoAssociates.com

Tel: 617-964-2924

Fax: 617-332-5477

[Pio@LombardoAssociates.com](mailto: Pio@LombardoAssociates.com)

53 Hill Street, Southampton, NY 11968