Report for

Town of Mahone Bay

Sewage Options Project - 2018

Bluenose Coastal Action Foundation

ABLE

Table of Contents

January 31st, 2018
493 Main Street
Mahone Bay, Nova Scotia

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The Town of Mahone Bay has requested a sewer study along Edgewater Street, as far as Main Street, and along Main Street at the treatment plant road eastward for approximately 300 meters. The purpose of the study is to evaluate and determine the best solution for affected properties in these areas. Some properties have functioning sewage disposal systems, while others have straight sewage pipes that discharge directly into the waters of Mahone Bay. The areas under review are geographically separated and each area has a different solution that has been developed for your review:

1. A series of on-site sewage disposal systems to service the properties along Edgewater Street

This option replies on a possible Town led program to create a Wastewater Management District and replace the straight pipes with new on-site sewage disposal systems. Similar programs in Nova Scotia have qualified for two-thirds cost sharing from the federal and provincial governments, resulting in the benefitting property owners contributing a little over one-third of the total project cost.

2. A 300-m extension of the existing conventional gravity sewer along Main Street to the Town Boundary at Maders Cove.

This proposed sewer extension will remove at least four straight pipes from discharging into the basin in this area. It will also allow another six homeowners along the 300m route to discharge into the sewer system, retiring their onsite sewage disposal systems, when required.

The proposed project involves collection of sewage in gravity lines draining to an existing lift station which pumps the sewage to the sewage treatment plant.

The project is estimated to require a capital investment of $207,310 and annual operating costs of $800.

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Executive Director
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Andre Veinotte
Engineer
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2.0 Current State of Existing Properties

The Town of Mahone Bay is located on the northwest shore of Mahone Bay, along the South Shore of Nova Scotia, in Lunenburg County. The sewage collection system for the Town consists of a combination of gravity sewer pipes and a sewage force main that all feed into a series of three wastewater collection pumping stations leading to a wastewater treatment plant constructed in 1994. The current system is a combined sewage – stormwater system that, on occasion, may overflow. Not all Town of Mahone Bay residents are connected to the Town's central wastewater treatment facility. There are approximately 30 properties not currently connected; some of which are presumed to have straight pipe septic systems directly discharging untreated sewage into Mahone Bay.

A survey was prepared and sent to the residents by the town. Of the 30 property owners surveyed, 13 responded with information regarding the type and condition/effectiveness of their existing on-site sewage treatment system.

After receiving the information from the property owners, staff from ABLE Engineering Services carried out a field survey on those properties that are not connected to central sewer and were identified as lacking functional on-site sewage treatment systems.

A summary of the state of identified properties can be found in Table A.

Table A Summary of Identified Properties

Street	Civic #	Straight Pipe	On-site System?	Comments
Edgewater	261	No	Yes	Currently serviced by an ATU which was installed in May 2016.
Edgewater	255	No	Yes	Civic numbers 255, 249 and 237 form a condo corp. The condominum is serviced by a 20 year old pumped C2-R located on the northern portion of the property
Edgewater	249	No	Yes	
Edgewater	237	No	Yes	
Edgewater	217	No	Yes	Currently serviced by a sloping sand filter which was installed in 2015
Edgewater	205	No	Yes	Currently serviced by an unknown on-site sewage disposal system. There is sufficient room for a replacement system if deemed nessesary.
Edgewater	191	No	Yes	Currently serviced by an unknown on-site sewage disposal system. There is sufficient room for a replacement system if deemed nessesary.
Edgewater	165	No	Yes	Currently serviced by an unknown on-site sewage disposal system. There is sufficient room for a replacement system if deemed nessesary, probably a holding tank.
Edgewater	141	No	Yes	Currently serviced by an unknown on-site sewage disposal system. There is sufficient room for a replacement system if deemed nessesary.
Edgewater	133	No	Yes	Currently serviced by an unknown on-site sewage disposal system (new tank in 2015). There is sufficient room for a replacement system if deemed nessesary, probably an ATU.
Edgewater	121	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-03. The proposed system will likely be a sloping sand filter.
Edgewater	101	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-04. Sewage will be will likely be a timed dose sloping sand filter.
Edgewater	97	No	No	Connected via pump system to sewer main beneath Orchard St.. There is sufficient room for a replacement system if deemed nessesary.
Edgewater	89	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-04. Sewage will be will likely be a timed dose ATU system with outfall to ditch.
Edgewater	77	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-04. The proposed system will likely be a sloping sand filter.
Edgewater	63	Yes	No	Anglican Church - one sink only; no toilets in church. Could be connected to Rectory Building (civic 53) which is serviced by sewer main below Parish Street, or install new ATU as shown in SK-04
Edgewater	53	No	No	Anglican Church Rectory - connected to sewer main beneath Parish St.
Main	922	No	No	Connected to sewer main beneath Main St.
Main	924	No	No	Connected to sewer main beneath Main St.
Main	932	No	No	Connected to sewer main beneath Main St.
Main	942	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-05. An on-site system would likely be an ATU.
Main	944	No	Yes	2 residences on this property, owner reports each with a functioning on-site sewage system.
Main	958	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-05. An on-site system would likely be an ATU.
Main	964	No	Yes	Currently serviced by an ATU which was installed in August 2017.
Main	970	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-05. An on-site system would likely be an ATU.
Main	984	Yes	No	There is sufficient room for a replacement system as shown in Drawing SK-05. An on-site system would likely be an ATU.
Main	994	No	Yes	Owner indicated has septic tank and disposal field of unknown type. There is sufficient room for a replacement system if deemed nessesary.
Main	995	No	No	No building on this property (former Smeltzer Boat Shed).
Main	997	No	No	Boat shed with no water or sewer facilities.

2.1 Sewage Treatment Options

Of the 30 identified properties, 9 have been found to be discharging untreated waste into the Mahone Bay Harbour. A common public misconception is that people think they are "grandfathered" to continue to allow this sewage to discharge untreated into the environment. This concept was finally eliminated in 2007 when the *NS Environment Act* was updated. If a person cannot find an acceptable solution to manage sewage on their property, Nova Scotia Environment now has the authority to terminate legal occupancy. Thankfully, this has not yet happened, although there have been several cases where existing lots have been denied building permits due to the inability for a proper sewage management system to be installed.

To decide if these properties should be connected to the existing central sewage system, or be solved using a decentralized approach, is determined by the cost per connection.

2.1.1 On-site Sewage Disposal

A modern on-site sewage disposal system is a very efficient way to manage sewage from a structure in a responsible manner. A modern system consists of a septic tank, which receives all the effluent that has been generated. It is sized to allow time for settleable solids to sink to the bottom, even when there are high peak loadings. The environment in a septic tank is anaerobic – meaning the bacteria that live in there do not require oxygen. What leaves the septic tank is a liquid, tea-like effluent that still contains at least half of the phosphorous, much of the nitrogen, and enough living bacteria and possibly viruses to still represent a potential health risk to the public. The effluent leaving the tank still requires treatment.

The most common way to treat this effluent is to introduce it to the subsurface, in a gentle manner, by spreading it out along a contour on a slope in a trench, or where it is flat and there is enough soil, in a bed. Ideally, for this to work for the lifetime of the residence, this effluent should be released to the bed or contour intermittently. Otherwise it will trickle into a bed and slowly overload the soil until it is plugged and in need of replacement. This usually takes about 15-25 years.

Where there is insufficient space for a conventional system, alternative methods can be used to pre-treat the effluent, through a series of aeration chambers, prior to releasing it to the soils. This type of technology is called an Aerobic Treatment Unit (ATU). There are several ATU's approved for use in Nova Scotia. They can be scaled up in size and used in non-residential applications.

Some properties produce high cyclic weekly loading, followed by time periods of minimal loading in-between. This is the case for many community buildings including churches. Since most of the capital cost for a system is due to the construction of the disposal field, it is often best to design the disposal field for the average weekly flow, rather than the peak flow when the facility is at full capacity (such as a wedding or funeral). To this end, we generally add storage tanks, and using a simple timer, slowly release the effluent to the disposal field over a period of time (yet to be designed). This method is called "timed-dose storage".

The estimated capital costs for servicing the discharging properties with on-site systems are listed in Table B.

Table B Capital Costs Estimate for On-site Sewage

Property Identifier	Probable System		Construction Cost	Engineering Cost
121 Edgewater St.	Gravity Sloping Sand Filter		$13,000	$1,390
101 Edgewater St.	Time Dose Sloping Sand Filter		$25,000	$1,390
89 Edgewater St.	Time Dose ATU		$30,000	$1,390
77 Edgewater St.	Pressurized Sloping Sand Filter		$16,000	$1,390
63 Edgewater St.	Combine Sewer with Rectory		$2,000	$0
		Sub-total	**$91,560**	**$5,560**
942 Main St.	ATU with dispersion		$19,000	$1,390
958 Main St.	ATU		$18,000	$1,390
970 Main St.	ATU		$18,000	$1,390
984 Main St.	ATU with dispersion		$19,000	$1,390
		Sub-total	**$79,560**	**$5,560**
			Total	**$171,120**

2.1.2 Sewer Extension

Extending the central sewer system to connect the identified properties can provide some nice advantages to the owners of the properties and, in some cases, the community. Municipal systems can properly, and cost-effectively, manage large volumes of waste water from a variety of residential and commercial sources and home buyers often view them as adding value to a home.

When on-site sewage disposal systems are maintained by public agencies, homeowners feel less responsible for their care and upkeep. That said, there are pros and cons associated with sewer systems.

Some benefits include:

- Home buyers generally view central sewer systems favorably.
- Central sewer systems rely on less regular maintenance from the homeowner to continue to function properly.
- Compared to on-site sewage disposal systems, central sewer systems may be less sensitive to non-human waste that is commonly flushed down the pipes.

Some drawbacks include:

- Off-property sewer upgrades can cost homeowners quite a bit either in billing increases or at the time of a home purchase.
- Homeowners are responsible for maintaining the sewer line that connects the house to the public sewer system. When this line clogs or deteriorates, repairs are necessary.

The estimated capital costs for servicing the discharging properties with on-site systems are listed in Table B.

Servicing properties along Edgewater Street was not seriously considered due to its topography; it would require a pump station to move the sewage from the properties to the nearest sewer main. The pump station generally costs $100K itself, and we estimate a cost of at least another $100K to route the new gravity sewers and force main. The estimated capital costs for servicing the discharging properties with central sewer are listed in Table C.

Table C Capital Costs Estimate for Sewer Extension

Property Identifier		Estimated Cost
Edgewater St.	Pump Station and Sewer Extension to Civic #121	>$200,000
	Sub-total	$N/A
Main St. East	8" Sanitary Gravity Sewer	$65,000
	Manholes	$16,500
	Lateral Connections	$10,250
	Engineering	$19,000
	Contingency Allowance	$5,000
	Sub-total	$115,750
	Total	**>$315,750**

3.0 Detailed Cost Comparisons and Finances

Along Edgewater Street, the choice to treat sewage from a financial perspective is simple. The properties in this section should be serviced with on-site sewage disposal systems.

The identified properties on Main Street, are somewhat more challenging to solve using the on-site sewage method. This is primarily due to space constraints on the lots, and the presence of drinking water wells. Fortunately, the topography of the area may provide an option to install a sewer extension in this section of town.

It should also be noted that if Main Street is to be excavated for installation of new sewer main, the Town should also consider extension of water main at the same time, and as well should consider replacing all cross culverts within the work area.

The capital costs for the two options are shown in Tables B and C.

On-site sewage disposal systems can qualify for funding programs much in the same way that central water or sewer infrastructure would, but they must be located within an area that has been established through a by-law as a Wastewater Management District (WMD). Once the WMD is created, the systems can be considered Municipally owned, operated, and maintained for a period of time (minimum 10 years).

Wastewater management districts are areas established by a Municipality (similar to a sewer district), but within which it has the authority to manage all wastewater treatment systems both public and private (i.e. individual, on-site sewage disposal systems). This means that in a WMD a Municipality has the authority to enter onto private property for purposes of constructing, inspecting, repairing, upgrading or replacing on-site septic treatment systems. The Municipality also has the authority to establish charges similar to those in a sewer district, to carry out the above noted duties.

The link below is to information from Municipal Affairs regarding WMDs and explains the process on setting up a WMD.

https://novascotia.ca/dma/pdf/mun-local-government-resource-handbook-5-10.pdf

3.1.1 Estimated Construction Costs

Property Identifier	Capital Cost	Cost/Connection
Edgewater St **On-site Sewage Disposal Systems**	$85,560	$21,390*
Edgewater St **Sewer Extension**	>$200,000	>$50,000
Main St. **On-site Sewage Disposal Systems**	$79,560	$19,890
Main St. **Sewer Extension**	$115,750	$28,938

*** Cost per connections are somewhat higher than typical due to the sewage load from the Churches.**

3.1.2 Estimate of Annual Operating Costs

On-site Sewage Disposal:

This report assumes the Town will enact a Wastewater Management District by-law, per the *NS Municipal Government Act*. The new systems would be owned by the Town for a period of 10 years. Maintenance costs for the proposed systems will vary somewhat, but average approximately $200 per year. The property owners would be responsible for energy costs in cases where pumps or compressors are utilized in the design. In the event that ownership of the sewage disposal system remains with the property owner, costs to the town would be nil.

Sewer Extension:

Additional energy costs would be approximately $400 per year for eight new connections to the existing pumping station. Another $100 would be needed annually for normal maintenance and repairs. Wastewater treatment costs to the Town of Mahone Bay for the proposed 300-meter extension are as follows:

Maintain Sewers and Lift stations/year		$500
Additional operating costs		$100
	Total	$600

3.2. Finances

The financial requirements to carry out the project are estimated to be between $171,120 and $207,310 for the construction costs depending if the discharging properties are serviced only by on-site sewage disposal or a combination of a gravity sewer system extension and on-site sewage disposal systems.

If a Wastewater Management District is enacted, then all capital costs would quality to be funded equally by the three levels of government. Other Municipalities have successfully received Federal funding from the Small Communities Fund to finance their WMDs.

3.3 CHANGES OR RISKS

The project costs are always an unknown until such time as the project is put out to tender. There is always the risk that costs of contractors willing to complete the work could increase suddenly due to competing projects commencing at the same time. Tenders will be evaluated upon receipt, and, if over budget, there is always the option of re-tendering at a later date or dividing the project up into manageable components.

Risks of delays of one or more components of the project are reduced as they are all being handled by the same firm; and the contractors will be expected to co-ordinate work schedules for successful project completion.

4.0 Impact of Climate Change on Pump Stations

In Nova Scotia, we are already experiencing warmer, wetter winters and hotter, drier summers compared to a few decades ago. Coastal sensitivity maps show that most of Nova Scotia is vulnerable to the effects of climate change. Much of our infrastructure was not built for a higher frequency of extreme weather events. By the end of the century, we can expect rapid acceleration in climate change, far beyond what we have observed to date. Likely impacts on the environment, society, and economy need to be addressed if we do not want to feel the full effects of more frequent and intense weather events, rising sea levels, and changes in our biodiversity and ecosystems.

Richards and Daigle (2011) state that local, or "relative" sea level in the neighbouring Town of Lunenburg is expected to rise by **0.9 meters** by year 2100. Areas of the coast will be permanently inundated due to sea level rise. Of greater concern, however, are the impacts associated with a higher possible storm surge. With local sea level higher, storm surges will reach further inland and could flood areas that have not been at risk of flooding in the past. In addition, storms may become more frequent and intense due to climate change, which means that the likelihood of a disastrous storm surge increases. While a number of hazards will be more likely to occur in the Town of Lunenburg due to climate change, this report focuses on the hazards associated with sea level rise and storm surge. We provide information on which areas of the Town will likely be affected by coastal inundation or an extreme storm surge, and illustrate the locations of infrastructure, buildings, and other community assets that may be at risk. We conclude by recommending adaptation measures that should be taken in order to prepare for possible sea level rise and storm surge scenarios.

Plausible Upper Bound Water Level in Lunenburg for Year 2100, calculated as the sum of: current HHWLT, predicted sea-level rise plus error bar, and the maximum storm surge recorded to date (Table B 22 - Richards and Daigle, 2011, p. 78) HHWLT (m) (CGVD28) Sea-Level Rise (2100) + Error Bar (m) Maximum Storm Surge to Date (m) Plausible Upper Bound Water Level (m) by Year 2100 1.63 1.54 1.63 **= 4.8 m** for Lunenburg and surrounding area which would include the Town of Mahone Bay.

4.1 Climate Change Mitigation Strategies for Sewage Collection and Pumping Stations

As previously discussed, the Town of Mahone Bay will see maximum storm surges in the order of 4.8m by the year 2100. As they currently exist, these storm surges will flood the sewage pumping stations and the water would then gravitate to the collection system. Street flooding following a rain event may also inundate pump stations and damage electrical equipment. The magnitude of the risk of a pump station experiencing flooding depends on their location and exact design. The impact of flooding would be wet well overflow that normally would cause local contamination and human health risk. In the case of flooding due to storm surge, the overflow would also be underwater and non-functional which would result in possible local sewage backups.

There are several strategies that can be implemented to improve the performance of pump stations against flooding events.

- Raising tops of lift stations above expected sea level rise and predicted storm surge levels to prevent storm water entering the system.
- Installing flapper valves, or one-way valves, on all overflows from sewage collection system to prevent sea water entering collection system.
- Installing watertight covers on lift stations and manholes to prevent storm water entering system.
- Install holding tank or surge tanks at lift stations to hold sewage during periods of extended power outages caused by storm events.
- Eliminate combined sewer systems to vastly decrease the inflow into the collection system.
- Eliminate and/or reduce storm water entering sanitary sewers from roof drains, sump pumps, leaking manholes, pipes, etc.
- Provide back-up power and/or portable pumping equipment for pumping stations and sewage treatment facilities.
- All new sewage infrastructure to be constructed to accommodate predicted climate change events.
- Steer new development and infrastructure away from low lying areas.

Each of these items would require a detailed engineering design to be implemented, and should be studied in detail to determine which items would provide the maximum benefit against flooding.

5.0 Conclusion

Of the 30 identified properties, only eight were confirmed to have sewage straight pipes which discharge into the harbour. An additional pipe, consisting of discharge from a sink, was also found, but can be readily connected to a structure that exists on the same lot.

There are also six properties that have systems of an unknown type, and are unverifiable. We have confirmed that each of these properties can be serviced with replacement on-site sewage disposal systems in the event of a malfunction.

The properties located on Edgewater Street are not practically serviceable from the central system, due to the distance from services and because a pump station would be required. As a result, on-site sewage disposal systems are proposed for the 4 properties in this area that have straight pipe sewage systems.

The option of an extension to the gravity collection system along Main Street has a number of benefits to the environment. The proposed sewage collection system will eliminate the discharges in this area from the 4 existing straight pipes. This option may also provide an avenue for future growth for the Town. The parcels of land along this section of Main Street are large as the lot sizes are currently restricted by on-site sewage regulations.

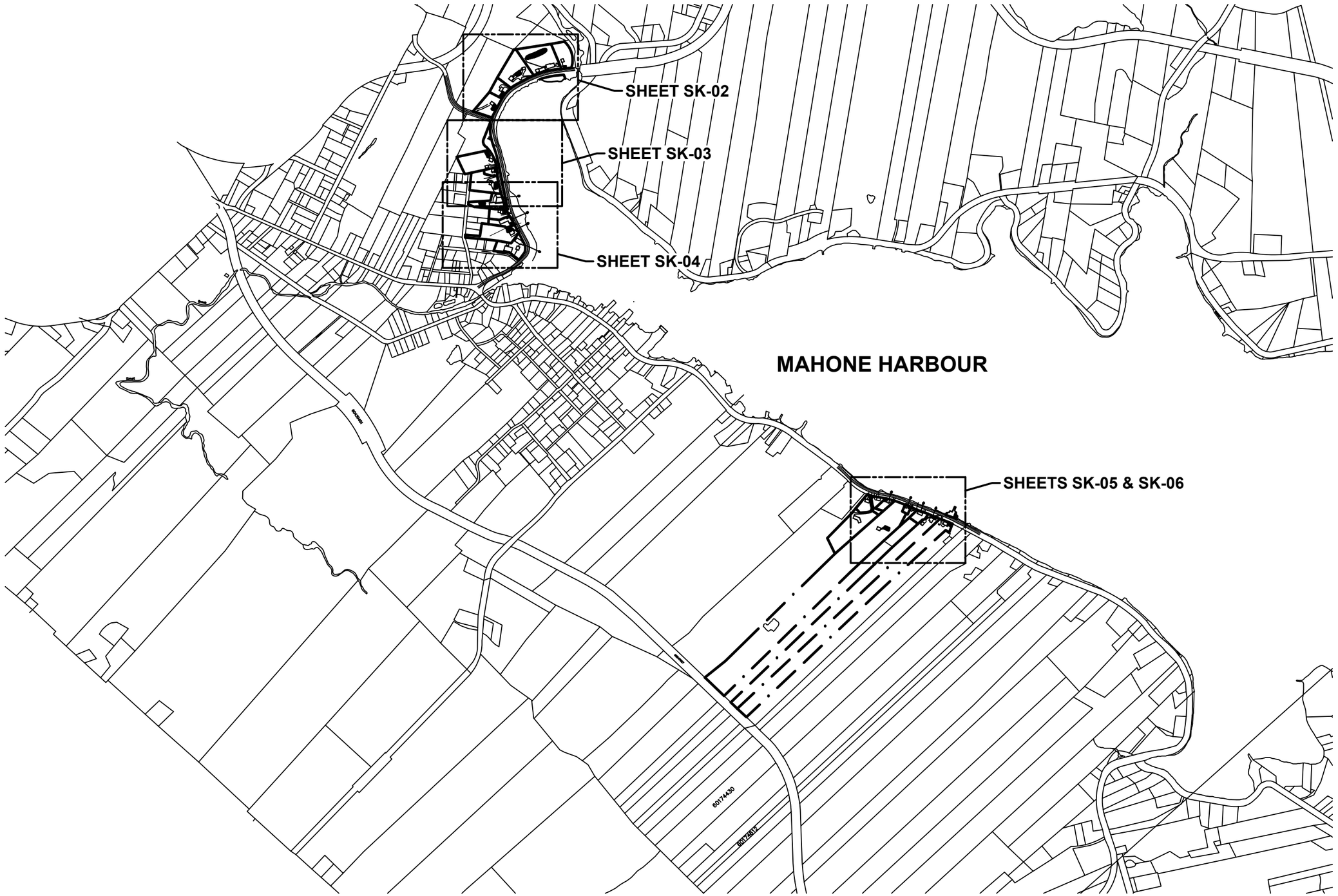
In the event that a Main Street sewer extension is not acceptable to the Town of Mahone Bay, on-site sewage disposal systems can be installed in this area if needed.

If a Wastewater Management District is created, all capital costs for sewage projects, even those built on private lands, qualify for funding from the Federal and Provincial governments.

References:

William Richards and Réal Daigle, *"Senarios and Guidance to Climate Change and Sea Level Rise – NS and PEI municipalities"*

Appendix A Drawings



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Bluenose Coastal Action Foundation

LEGEND

BOUNDARY LINE
DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
- DRAWING UNITS ARE IN METERS.
- PROPERTY BOUNDARIES SHOWN HAVE BEEN DERIVED FROM NSPRD INFORMATION AND AERIAL IMAGERY.

PROJECT

BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

EXISTING STRAIGHT PIPE KEY PLAN

DESIGNED	A.VEINOTTE
DATE	02FEBRUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
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DRAWING NO.	SHEET NO.
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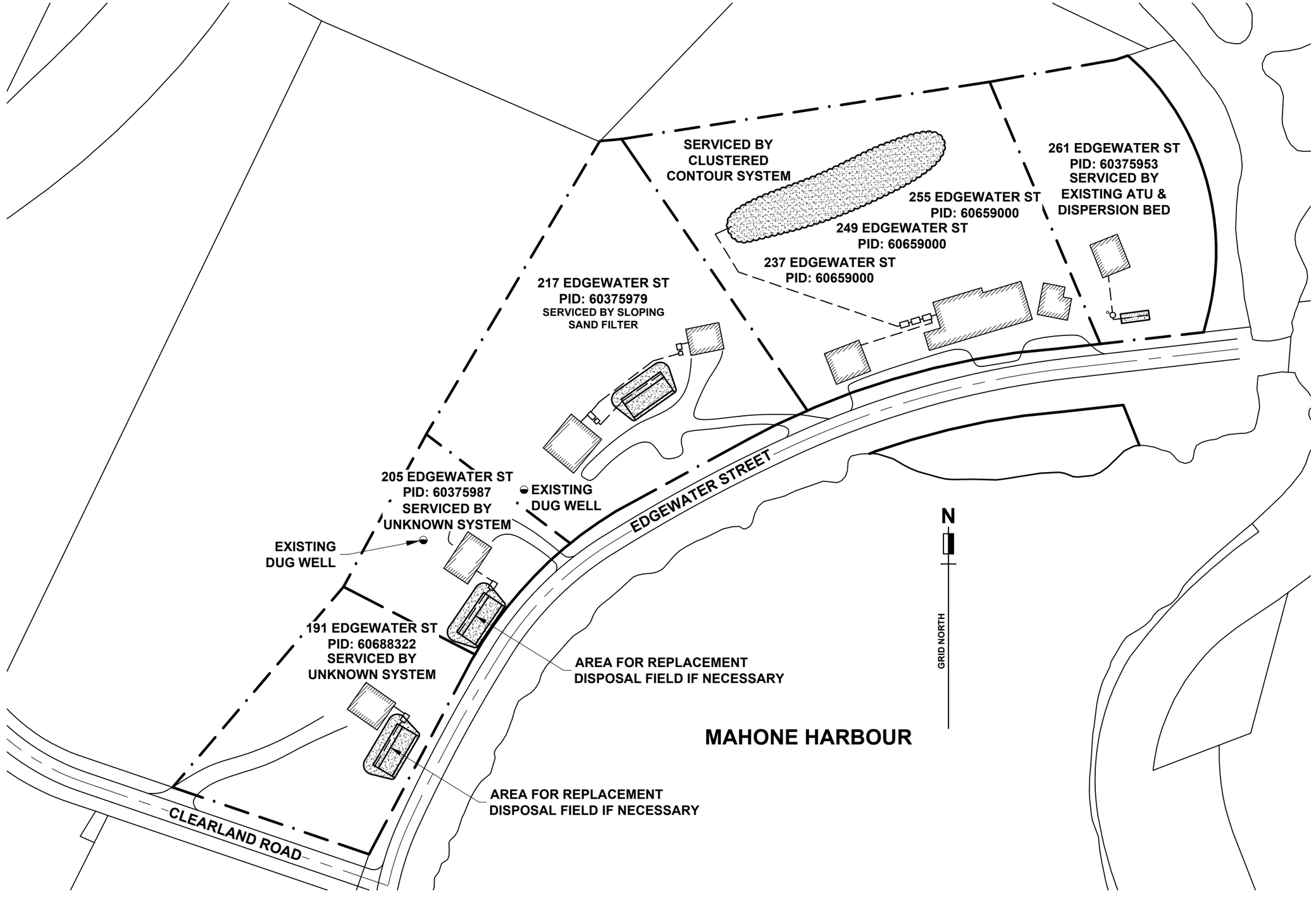

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LEGEND

STRAIGHT PIPE----------

SEPTIC TANK----------

SLOPING SAND FILTER-

DISPERSION BED---------

PEAT MODULE----------

ADVANCED TREATMENT UNIT--------

BOUNDARY LINE

DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
- DRAWING UNITS ARE IN METERS.
- PROPERTY BOUNDARIES SHOWN HAVE BEEN DERIVED FROM NSPRD INFORMATION AND AERIAL IMAGERY.

PROJECT

BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

EDGEWATER STREET NORTH EXISTING & CONCEPTUAL ON-SITE PLAN

DESIGNED	A.VEINOTTE
DATE	02FEBRUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
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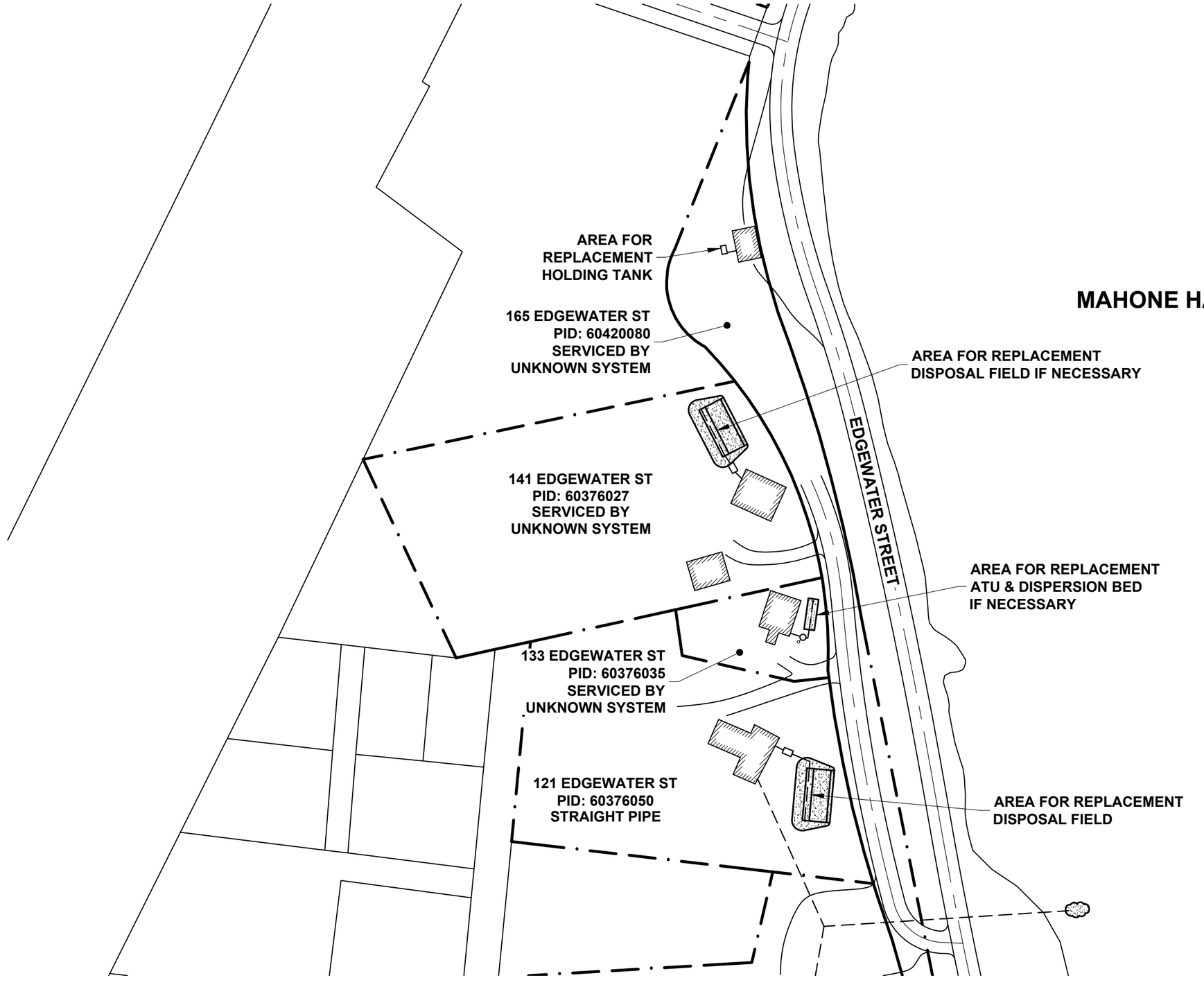
DRAWING NO.	SHEET NO.
SK-02	2 OF 6



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Bluenose Coastal Action Foundation

LEGEND

STRAIGHT PIPE----------
SEPTIC TANK----------
SLOPING SAND FILTER-
DISPERSION BED---------
PEAT MODULE----------
ADVANCED TREATMENT UNIT--------
BOUNDARY LINE
DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
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PROJECT

BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

EDGEWATER STREET EXISTING & CONCEPTUAL ON-SITE PLAN

DESIGNED	A.VEINOTTE
DATE	02FEBRUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
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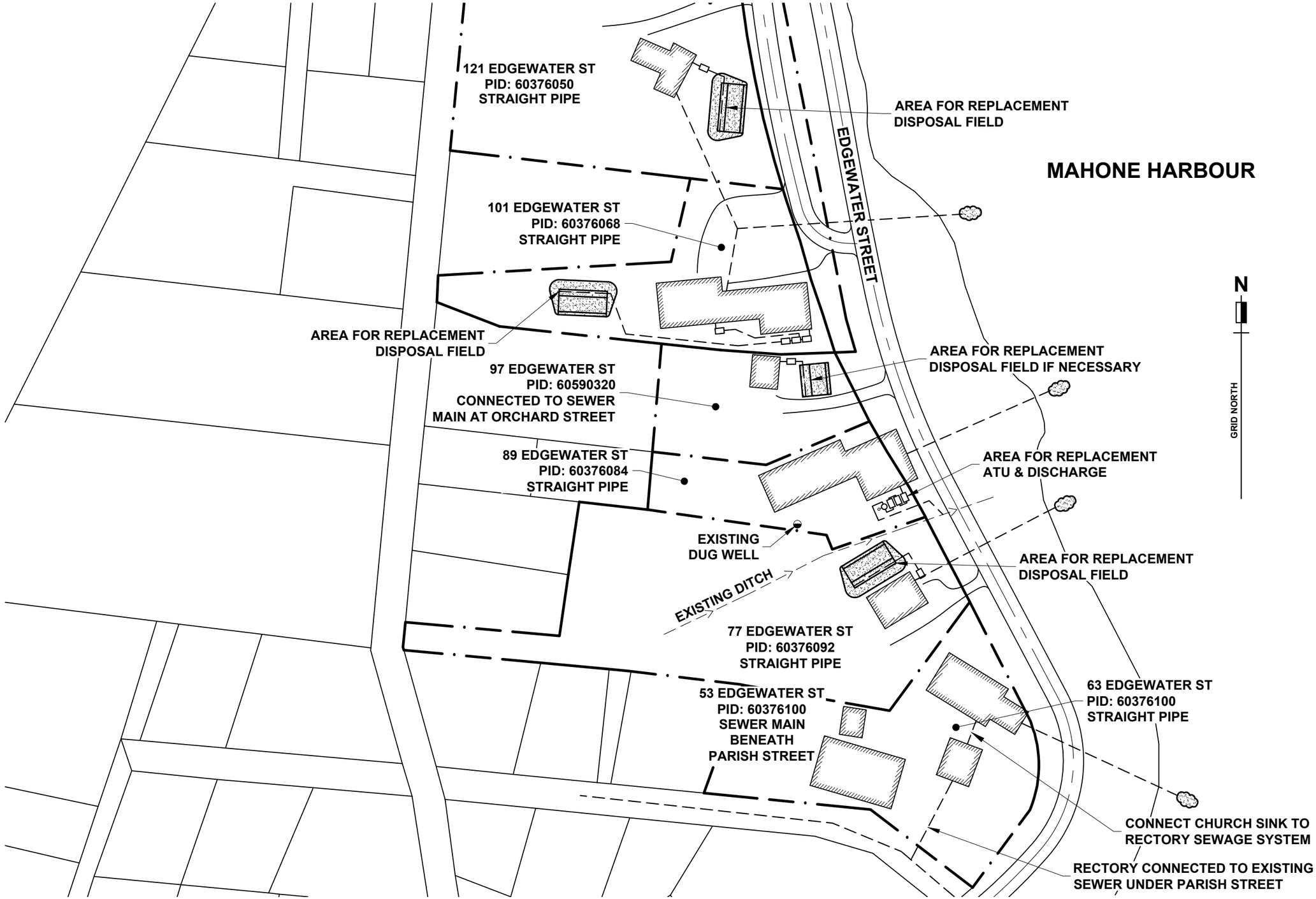
SK-03	3 OF 6



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Bluenose Coastal Action Foundation

LEGEND

STRAIGHT PIPE----------
SEPTIC TANK----------
SLOPING SAND FILTER-
DISPERSION BED---------
PEAT MODULE----------
ADVANCED TREATMENT UNIT--------
BOUNDARY LINE
DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
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PROJECT

BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

EDGEWATER STREET SOUTH EXISTING & CONCEPTUAL ON-SITE PLAN

DESIGNED	A.VEINOTTE
DATE	02FEBRUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
170726-04	A
DRAWING NO.	SHEET NO.
SK-04	4 OF 6

MAHONE HARBOUR

N

GRID NORTH

AREA FOR REPLACEMENT
ATU & DISPERSION BED

AREA FOR REPLACEMENT
ATU & DISCHARGE

AREA FOR REPLACEMENT
ATU & DISCHARGE

AREA FOR REPLACEMENT
ATU & DISPERSION BED

MAIN STREET

922 MAIN ST
PID: 60682622
SEWER MAIN
AT MAIN STREET

EXISTING
DUG WELL

942 MAIN ST
PID: 60371366
STRAIGHT PIPE

958 MAIN ST
PID: 60371341
STRAIGHT PIPE

964 MAIN ST
PID: 60532249
SERVICED BY ATU

932 MAIN ST
PID: 60419629
CONNECTED TO
SEWER MAIN
AT MAIN STREET

924 MAIN ST
PID: 60371374
SEWER MAIN
AT MAIN STREET

EXISTING
DUG WELLS

970 MAIN ST
PID: 60371325
STRAIGHT PIPE

EXISTING
DRILLED WELL

984 MAIN ST
PID: 60371309

EXISTING
DUG WELL

995 MAIN ST
PID: 60371291

997 MAIN ST
PID: 60504487

994 MAIN ST
PID: 60371283

AREA FOR REPLACEMENT
DISPOSAL FIELD IF NECESSARY

AREA FOR REPLACEMENT
DISPOSAL FIELD IF NECESSARY

944 MAIN ST
PID: 60371358
SERVICED BY
UNKNOWN SYSTEM

ABLE

ABLE ENGINEERING SERVICES INC.
4073 HIGHWAY #3
P.O. BOX 959
CHESTER, NOVA SCOTIA, B0J 1J0
TEL. 1-833-756-8433
FAX. 902-273-3072
engineering@ableinc.ca

Bluenose
Coastal Action
Foundation

LEGEND

STRAIGHT PIPE----------
SEPTIC TANK----------
SLOPING SAND FILTER-
DISPERSION BED---------
PEAT MODULE----------
ADVANCED
TREATMENT UNIT--------
BOUNDARY LINE
DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
- DRAWING UNITS ARE IN METERS.
- PROPERTY BOUNDARIES SHOWN HAVE BEEN DERIVED FROM NSPRD INFORMATION AND AERIAL IMAGERY.

PROJECT

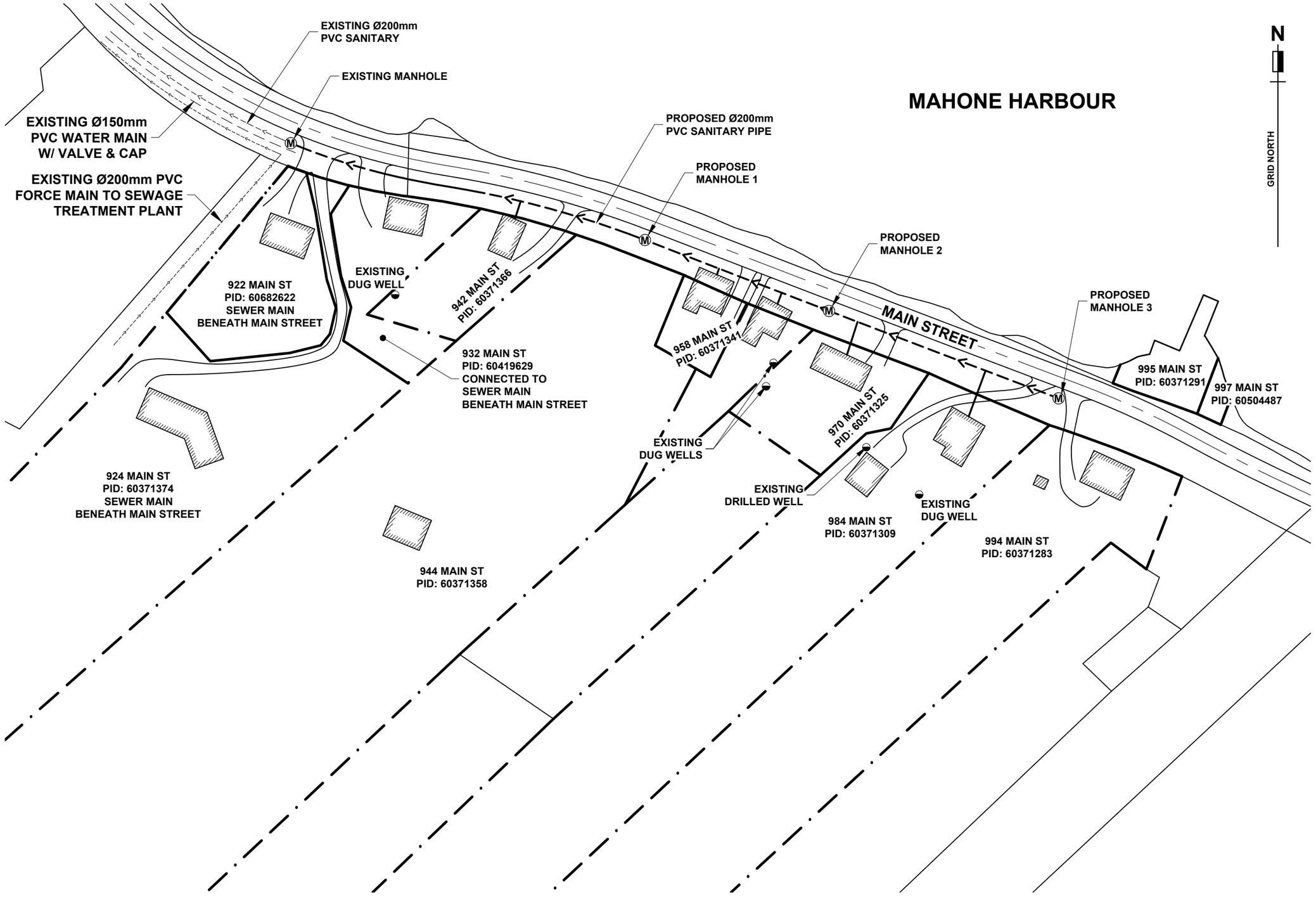
BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

MAIN STREET EXISTING & CONCEPTUAL ON-SITE PLAN

DESIGNED	A.VEINOTTE
DATE	02FEBRUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
170726-04	A
DRAWING NO.	SHEET NO.
SK-05	5 OF 6



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Bluenose Coastal Action Foundation

LEGEND

PROPOSED Ø200mm PVC SANITARY PIPE

EXISTING Ø200mm PVC SANITARY PIPE

BOUNDARY LINE
DITCH LINE..CENTER LINE OF DITCH
OHWM.....ORDINARY HIGH WATER MARK
OWM.....ORDINARY WATER MARK
ROW.....RIGHT OF WAY BOUNDARY

GENERAL NOTES:
- DRAWING UNITS ARE IN METERS.
- PROPERTY BOUNDARIES SHOWN HAVE BEEN DERIVED FROM NSPRD INFORMATION AND AERIAL IMAGERY.

PROJECT

BLUENOSE COASTAL ACTION FOUNDATION SEWAGE STUDY MAHONE BAY

DRAWING

MAIN STREET PROPOSED SEWER EXTENSION CONCEPT PLAN

DESIGNED	S.DEWAR
DATE	29JANUARY2018
DRAWN	M.ENGLAND
DATE	02FEBRUARY2018
CHECKED	A.VEINOTTE
DATE	02FEBRUARY2018
APPROVED	
DATE	

PROJECT NO.	REVISION
170726-04	A
DRAWING NO.	SHEET NO.
SK-6	6 OF 6