Long Term Control Plan for

TOWN OF ST. JOHNSBURY COMBINED SEWER

ST. JOHNSBURY, VERMONT

December 18, 2020

Revised: March 1, 2021

Submitted to:
Chad Whitehead, Town Manager
Town of St. Johnsbury
Pomerleau Building, Suite 3
St. Johnsbury, VT 05819

DUFRESNE GROUP
CONSULTING ENGINEERS

Springfield, VT | Barre, VT | St. Johnsbury, VT | Manchester Center, VT | 802.674.2904 | info@dufresnegroup.com | www.dufresnegroup.com

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December 18, 2020

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SECTION 1
EXECUTIVE SUMMARY
PRELIMINARY ENGINEERING REPORT
COMBINED SEWER LONG TERM CONTROL PLAN
ST. JOHNSBURY, VERMONT
December 18, 2020

Summary

The St. Johnsbury Wastewater Collection System serves the Town of St. Johnsbury and St. Johnsbury Center. The wastewater system is a combined sewer and stormwater collection system. The Town of St. Johnsbury has been making substantial upgrades to the collection system to provide separated sewer and stormwater collection systems. Despite all the improvements made, there is still a large amount of combined sewer mains and overflow structures that require an astounding amount of capital improvements to stop overflows to surface water during stormwater runoff. The Town of St. Johnsbury was issued 1272 Order for Discharge Permit No. 3-1290. This Long Term Control Plan (LTCP) is in response to the 1272 Order.

During the preparation of this LTCP we reviewed the following sources of information:

1. Preliminary Engineering Report: Wastewater Improvement RF1-153POTW by Dufresne Group, Dated December 20, 2013
2. Report: CSO Monitoring Study by Earth Tech, Inc. Dated April 2008
3. Plan Set: Sewerage System of St. Johnsbury, Vermont by W. C. Evans, Dated April 1982
4. Plan: St. Johnsbury, VT Sewers by C. S. Sumner, Dated September 1956.
5. Plan Set: Proposed Sewerage System Contract No 1 and No 2 by Whitman & Howard, Dated 1962
6. Plan Set: Lateral Sewers, Storm Drains and In-line Grit Removal Facilities by Whitman & Howard, Inc., Dated February 1995.
7. Closed Circuit Television (CCTV) inspection of the existing combined sewer system conducted by Hartigan Wastewater Services of Middlesex, Vermont on March 27 through April 6, 2018 under the direction of Dufresne Group.

Wastewater gathered by the St. Johnsbury collection system is treated by a wastewater treatment plant located on Bay Street. The collection system includes separated sanitary and storm mains, and combined sanitary/storm mains, that vary in size from 24-inch brick lined down to 6-inch clay tile.

The improvements to the combined sewer collection system identified in this report will resolve combined sewer overflows, hydraulic capacity issues, undersized piping, inadequate maintenance access, alignment problems, and aging infrastructure deficiencies. Alternative improvements and recommendations are contained in Section 4. Section 5 presents a schedule, construction costs, and total project costs with a review of potential funding scenarios for the project.

The recommendations are based on key findings during development of the LTCP, which are summarized below:

1. The size of the existing combined sewer collection mains within the Project Area are inadequate to hydraulically convey both sanitary and storm sewer. During significant rain events, backwatering of sewage into customer establishments and overflows have been recorded by the Public Works Department.

2. The existing mains are mostly constructed of Vitrified Clay Pipe that is currently in poor structural condition due to cracks, joint separation, and sagging. VC pipe also has a higher potential for vegetation roots to infiltrate the existing mains and cause obstructions.

3. The Town has completed stormwater separation projects that currently contribute to the combined system. The recommendations finalize those efforts to fully remove the stormwater from the combined sewer collection system.

Conclusions

1. Substantial growth of the sewer collection system is not anticipated within the project area based on zoning development allowances in the Town of St. Johnsbury, historic population data, and historic water demand data. Currently, there are no identified development projects within the project area. The overall town population has decreased an estimated 5.9% from 2010 to 2019. Based on these factors, population growth and wastewater system demand are not anticipated to increase significantly in the next several decades, while removing stormwater from the collection system provides an increased capacity should a larger user want to connect.

2. The existing combined sewer collection system within the Project Area includes connections to storm drain collection structures, which increases the flow to Combined Sewer Overflow (CSO) Structures. Reduction in flow to CSO structures is in compliance with the Town of St. Johnsbury 1272 Order from the Vermont Agency of Natural Resources.

3. Based on CCTV inspections, the combined sewer collection mains located within the Project Area are susceptible to structural failure and clogging.

Recommendations

1. Sanitary sewer collection main replacement with separated stormwater collection mains is recommended to address the deficiency of existing undersized combined collection system pipes with stormwater collection structure connections. Sanitary sewer main replacement projects are also recommended to replace vitrified clay pipe to eliminate maintenance and infiltration concerns.

2. The Town should review and refine procedures for cleaning of the wastewater collection system. This should include gaining access to mains that are currently inaccessible.

3. The combined sewer outfall monitoring program should be reviewed and updated to ensure accurate data is being collected and reported.

4. Additional flow monitoring equipment should be installed.

5. A reduction of impervious area coupled with the addition of green infrastructure practices within the combined collection area is recommended to reduce stormwater runoff and provide stormwater treatment.

6. Town representatives should review the specific improvements identified in this report and provide input and/or revisions to conform to local desires.

7. This report should be used for fiscal planning purposes and be submitted to both the State of Vermont Agency of Natural Resources and to USDA Rural Development for review, approval and preliminary funding assessment.

8. Town officials should set a sewer rate sufficient to fund the capital borrowing necessary to fund the project.

9. The Town should plan for a Spring 2021 bond vote and file construction loan applications based on funding agency input and offers.

10. Town officials should apply for funding to improve current monitoring system.

11. Town officials should work to continue CCTV inspections of interceptor mains.

12. The Town should actively enforce sewer ordinances to prevent additional stormwater from entering the collection system.

SECTION 2
HISTORY OF CSOs
PRELIMINARY ENGINEERING REPORT
COMBINED SEWER LONG TERM CONTROL PLAN
ST. JOHNSBURY, VERMONT
December 18, 2020

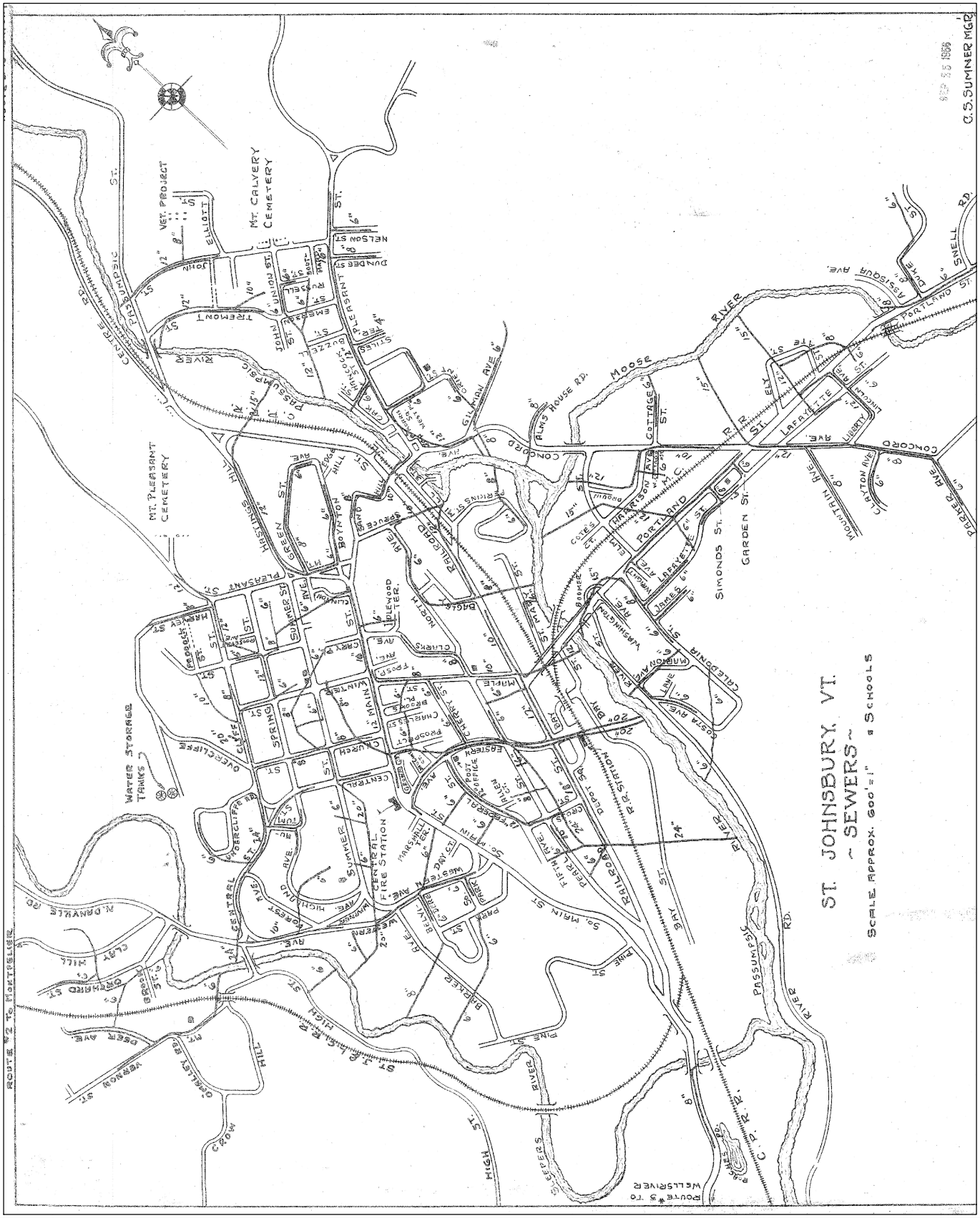
History of Combined Sewer

The history of the combined sewer collection system in the Town of St. Johnsbury is not as well-known as the water distribution system. The mains were constructed privately as buildings were erected and were maintained by the users it served. No treatment was provided, so no cost or entity to provide the treatment was established. However, by 1860 the St. Johnsbury Aqueduct Company was suppling domestic and fire protection water to the Village residents, and it is likely that the combined sewer collection system was in place as well. The earliest map dates 1958 and shows an extensive web of collection mains that cross lots and under buildings before discharging in approximately 32 locations throughout the Village limits, as shown in Figure 2-1.

In the 1960s, three interceptor mains were constructed along the shores of the rivers to collect these discharge locations and convey the combined sewer to a treatment facility (WWTP). To reduce the size of the mains installed, structures that allow excess flow from storm events to discharge to the river were constructed at locations where the interceptors picked up larger combined mains. The interceptor design plans showed 27 overflow structures, currently there are 16 overflows and a treated discharge at the WWTP.

In accordance with the provisions of 10 V.S.A. § 1272 and the Combined Sewer Overflow Rule (Environmental Protection Rule, Chapter 34) the Town of St. Johnsbury is required to maintain a 1272 order – discharge permit. When the 1272 Order initiated, the preliminary goal was to eliminate dry weather overflows. Since then the following activities were performed to remain in compliance with the order:

- In 1990 flapper gates were installed on the outlet pipes to reduce the amount of river water being introduce to the collection system.
- In 2009 warning signs were posted to provide public notification of the possibility of contamination.
- Weirs have been installed and/or adjusted to reduce discharge frequency
- Overflows have been eliminated
- Storm connections have been disconnected



DUFRESNE GROUP
CONSULTING ENGINEERS

Suite 200, 56 Main Street
Springfield, Vermont 05156
Tel: (802) 674-2904 Fax: (802) 674-2913
E-mail: info@dufresnegroup.com
Home page: www.dufresnegroup.com

FIGURE 2-1

1958 COMBINED SEWER COLLECTION MAP

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MGR. AJD
SCALE AS SHOWN
DATE DEC. 18, 2020
DRAWING NO. 1958 MAP.dwg

FILE: J:\St. Johnsbury VT\3190007 CSO LTCP\CAD\Figures\1958 MAP.dwg Dec 10, 2020 - 10:24am

Summary of Previous Reports

In order to determine the best management practices, the following reports were prepared:

- 1975 Inflow/Infiltration Report
- 1981 Facility Plan
- 1991 Preliminary Engineering Study of CSOs, Whitman & Howard
- 1992 Monitoring Program, Utility Pipeline Services, Inc and Whitman & Howard
- 1993 Phase I Combined Sewer Overflow Abatement Program, Whitman & Howard
- 2008 CSO Monitoring Study, Earth Tech
- 2008 Operation, Management and Emergency Response Plan
- 2015 Inventory of CSO Abatement Projects, Dufresne Group

The 1981 Facility Plan identified 26 overflow locations, over the years 35 manhole structures have had overflow pipes that discharged either directly to a water way or to a designated storm that discharges to the water way. The Town has been working on reducing and/or eliminating combined sewer overflow events for several decades, which has led to 18 structures being eliminated and one structure has not been found. Table 2-1 outlines the 16 overflows that have the ability to discharge and are monitored:

Table 2-1
ACTIVE CSOs

CSO	Location
CSO 006	Bay Street between electrical substation and Passumpsic River on Interceptor 1
CSO 006A	Bay Street between electrical substation and Passumpsic River
CSO 007	Lower Portland Street
CSO 008	Bay Street between Allen Lumber and Passumpsic River on Interceptor 1
CSO 009	Bay Street at 136 Bay Street on Interceptor 1
CSO 010	St. Mary Street between 120 St. Mary Street and Passumpsic River on Interceptor 1
CSO 010A	Driveway of 206 St. Mary Street on Interceptor 1
CSO 011	Elm Street in driveway of American Legion Baseball Field on Interceptor 2
CSO 014	Mill Street at 98 Mill Street on Interceptor 1
CSO 016	Concord Avenue at Fred Mold Park on Interceptor 2
CSO 020	Hood Pump Station
CSO 021	Tremont Street on Interceptor 2
CSO 023	Western Avenue between 357 Western Avenue and Sleepers River on Interceptor 3
CSO 024	Western Avenue between 257 Western Avenue and Sleepers River
CSO 027	Western Avenue at Mount Vernon Street on Interceptor 3
SMH	Western Avenue at Water Department Road

The 1991 Preliminary Engineering Study of Combined Sewer Overflows by Whitman & Howard identified that separation of storm and sewer was the recommended alternative for addressing the Town's CSOs. The study listed five phases to reduce and/or eliminate CSO events, as identified in the Table 2-2.

TABLE 2-2
WHITMAN & HOWARD CSO REDUCTION/ELIMINATION PER PHASES

Phase	Description	CSO Impacted	Status
A	Cliff and Central Street Areas	CSO 027	Completed
B	Hasting Hill Area	CSO 020	Completed
C	Cliff Street, Summer Street, Central Street, Church Street, Winter Street, Webster Street, and Mount Pleasant Street Areas	CSO 023, 024, 027	Completed
D	Tremont Street, Union Street, Emerson Street, Russell Avenue, Southard Street	CSO 021, 016	Completed
E	Portland Street	CSO 007, 011	Not Completed

The 1993 Phase I Combined Sewer Overflow Abatement Program by Whitman & Howard, Inc report concluded in addition to complete separation of the combined sewer collection system, the following Best Management Practices (BMPs) be implemented for short-term improvements:

- Litter control
- Street sweeping
- Catch basin cleaning
- Sewer and interceptor cleaning
- CSO regular inspections, adjustments, and maintenance
- Stormwater flow slipping, which directs stormwater past combined catch basins to separated catch basins
- Inline grit removal
- Maximizing wet-weather flow to the wastewater treatment plant

Summary of CSO Events

CSO events were reported by the Town on 31 occasions between February of 2019 and August of 2020, as summarized in Table 2-3.

TABLE 2-3
CSO EVENT HISTORY

Date	Number of CSOs Discharging	Total 24hr Precipitation (inches)	Total 24hr Snowfall (inches)
February 7, 2019	1	0.28	0.20
April 15, 2019	2	1.80	0.00
June 11, 2019	7	0.85	0.00
June 20, 2019	7	1.60	0.00
June 25, 2019	7	0.67	0.00
June 30, 2019	1	0.96	0.00
August 8, 2019	2	0.37	0.00
August 21, 2019	7	0.63	0.00
August 26, 2019	2	0.00	0.00
September 23, 2019	8	1.40	0.00
September 24, 2019	8	2.20	0.00
October 1, 2019	2	0.23	0.00
October 2, 2019	9	0.68	0.00
October 7, 2019	6	1.70	0.00
October 8, 2019	6	0.06	0.00
January 12, 2020	6	0.51	0.01
January 13, 2020	7	0.01	0.09
February 27, 2020	3	0.51	1.60
March 2, 2020	3	0.03	0.00
April 13, 2020	6	0.75	0.00
April 17, 2020	7	0.02	0.33
May 15, 2020	8	0.18	0.00
May 18, 2020	8	0.00	0.00
May 29, 2020	12	0.31	0.00
June 1, 2020	12	0.00	0.00
July 1, 2020	10	0.42	0.00
July 7, 2020	8	0.05	0.00
July 14, 2020	9	1.80	0.00
July 16, 2020	9	0.00	0.00
July 20, 2020	11	0.21	0.00
July 21, 2020	11	0.00	0.00

Note: Precipitation data from station IV4 – Saint Johnsbury, 44.42 N 72.0208 W

The most active CSO was 016 on Concord Avenue adjacent Fred Mold Park. Table 2-4 prioritizes the CSO by frequency of discharges between February of 2019 and August of 2020.

TABLE 2-4
CSO PRIORITY LIST

Priority	CSO	Number of Reported Discharges
1	016	27
2	010	25
3	006	24
4	009	23
5	011	19
6	008	17
7	007	16
8	010A	15
9	014	15
10	024	9
11	021	5
12	027	5
13	023	4
14	020	0
15	SMH-Western Avenue	0

Implementation of Nine Minimum Control Measures

EPA has published a list of nine minimum control (NMC) measures that all municipalities are to follow as they work towards elimination of CSOs. Those control measures are as follows:

TABLE 2-5
NMC MEASURES

No.	Description	Actions by Municipality
1	Proper operation and regular maintenance programs.	St. Johnsbury has equipment and staff that complete annual cleaning and maintenance of sewer mains.
2	Maximum use of the collection system for storage.	A majority of the CSO structures have been altered with weirs to a maximum elevation without causing backups into properties.
3	Review and modification of pretreatment requirements to ensure that CSO impacts are minimized.	
4	Maximization of flow to the treatment plant.	A majority of the CSO structures have been altered with weirs to a maximum elevation without causing backups into properties.
5	Elimination of CSOs during dry weather.	As part of the Town's 1272 Order, it is required to visually inspect twice per month between June 1st and September 30th.

TABLE 2-5 cont.
NMC MEASURES

No.	Description	Actions by Municipality
6	Control of solid and floatable materials in CSOs.	
7	Pollution prevention programs to reduce contaminants in CSOs.	
8	Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.	Signs have been installed at all CSO discharge points warning public that outfall may discharge sewage during and following heavy rain.
9	Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.	St. Johnsbury has three CSOs that contain electronic flow monitoring and provides alarm notification when levels are at overflow.

Effects CSOs Have on Receiving Waters

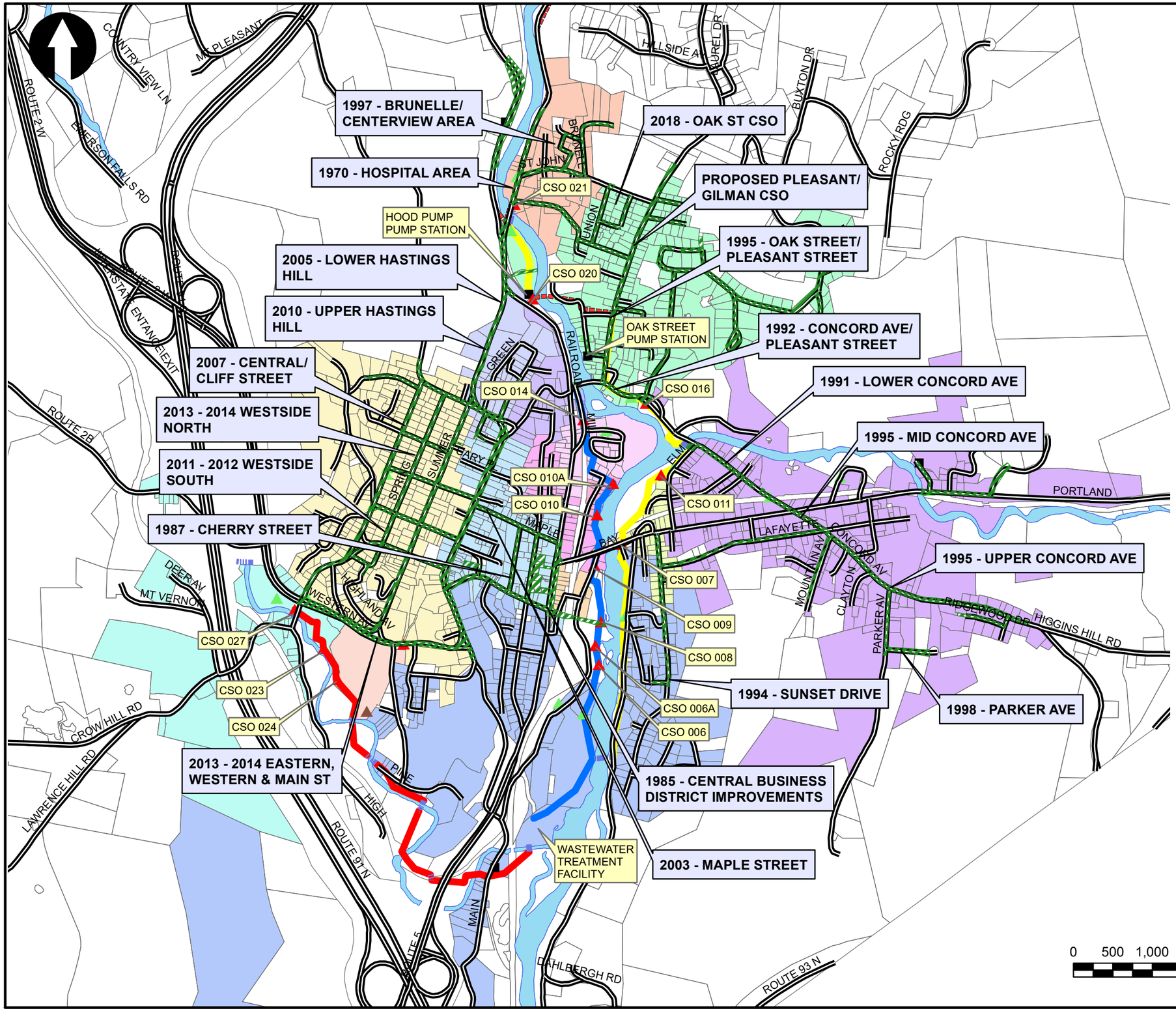
Following the 1991 Preliminary Engineering Study, The Town was notified that discharges into the Class B Sleepers and Moose Rivers would not be allowed. Based on that declaration, alternatives were altered to work toward eliminating the discharges into those rivers. Since then, all discharges into the Moose River have been eliminated and discharges into the Sleepers River have been greatly reduced.

Currently the Town of St. Johnsbury CSOs discharge into the Passumpsic and Sleepers River. The 2018 Water Quality Assessment Report for the Passumpsic Watershed by the Vermont Department of Environmental Conservation Watershed Planning Program lists the portions of the Passumpsic and Sleepers Rivers with CSO discharge points as impaired by E. coli. The report directly attributes the E. coli contamination to the CSOs, estimating that between 01/01/2008 and 10/16/2018 an estimated volume of between 52,900 and 64,600 gallons of untreated combined sewer was discharged during large rain events.

Summary of Work Done to Date to Eliminate CSOs

In order to reduce and eliminate combined sewer overflows, the Town has completed over two dozen projects that have installed 36,735 LF of sewer main and 45,740 LF of storm main, with an additional 10,330 LF of sewer main and 3,600 LF of storm main planned to be bid 2020. These projects have been outlined below in Table 2-6 and shown in Figure 2-2.

The Town is also working with Caledonia County Natural Resources Conservation District (NRCD) to disconnect three catch basins that service an approximately 30,000 square foot municipal parking lot. Based on a 1-year storm, this project will prevent approximately 30,600 gallons of stormwater over a 24-hour period from entering the combined sewer system.



Legend

- AREAS WITH DESIGNATED STORM
- ROADS

CSO STATUS

- ACTIVE
- ELIMINATED
- NOT FOUND
- PUMP STATIONS
- SIPHONS
- FORCE MAINS
- INTERCEPTOR 1
- INTERCEPTOR 2
- INTERCEPTOR 3
- RIVERS

CONTRIBUTING PROPERTIES

- CSO 006
- CSO 007
- CSO 008
- CSO 009
- CSO 010
- CSO 010A
- CSO 011
- CSO 014
- CSO 016
- CSO 020
- CSO 021
- CSO 023
- CSO 024
- CSO 027
- WWTF

DUFRESNE GROUP
CONSULTING ENGINEERS

459 Portland Street, Suite 106
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605 Fax: (802) 748-4512
E-mail: dufresne@vermontel.net
Home page: http://www.dufresnegroup.com

Project #	3190007
Project Mgr.	AJD
Design	EAE
Checked by	EAE
Date	DEC. 18, 2020
Scale	AS SHOWN
Approved by	Approved by

FIGURE 2-2

CSO REDUCTION PROJECTS

SAINT JOHNSBURY, VERMONT

FIG 2-2

DWG NO		Date	
SHEET	X	OF	X

TABLE 2-6
SUMMARY OF WORK DONE TO DATE TO ELIMINATE CSOs

Year Comp.	CSO Impacted	Area	Description of Work			Funding Used	Construction Cost
			Sewer (LF)	Storm (LF)	Water (LF)		
1970	CSO 021	Memorial Drive (Tremont North), Tremont Street, St. John Street (Memorial to Centerview)	2,550			EDA 01-1-00451	
1984	CSO 006/ CSO 006A	Railroad Street (Eastern to Maple) Eastern Avenue (Railroad to Pearl) Depot Street	1,860	2,275		EDA 01-21-00005 and CDBG B-82-DH-50-0014	
1987	CSO 006	Cherry Street		830		VTrans M 7000(12)	
1991	CSO 011	Concord Avenue (Elm to RR ROW)		975		VTrans M 7000(11)S	
1991	CSO 011	Concord Avenue (RR ROW to Parker)		2,050		VTrans	
1992	CSO 016	Concord Avenue (Gilman to Pleasant) Pleasant (Concord to Jones)		900		Constructed by Town Public Works Department (PWD)	
1992-1993	CSO 016	Oak Street (Passumpsic River to Pleasant) Pleasant Street (Oak to northern School)		880		Constructed by PWD	
1994	WWTF	Sunset Drive		610		Constructed by PWD	
1995	CSO 011	Concord Avenue (Parker to Ball)		1,840		Constructed by PWD	
1995	CSO 021	Buzzell Street Centerview Terrace	1,360	1,420			

TABLE 2-6 cont.
SUMMARY OF WORK DONE TO DATE TO ELIMINATE CSOs

Year Comp.	CSO Impacted	Area	Description of Work			Funding Used	Construction Cost
			Sewer (LF)	Storm (LF)	Water (LF)		
1996	CSO 007	Caledonia Street (Portland to Marion) Lafayette Street (Caledonia to crest)		1,530 storm utility discharges into sewer		Constructed by PWD	
1996	WWTF	Caledonia Street (Marion to Sunset)		550		Constructed by PWD	
1996	CSO 011	Lafayette Street (Concord to crest)		1,260		Constructed by PWD	
1998	CSO 011	Parker Avenue	440	1,300		Constructed by PWD	
2002	CSO 006	Pearl Street (Eastern to Maple)	325	575		Constructed by PWD	
2003	CSO 006	Maple Street	1,130	995		Constructed by PWD	
2007	CSO 027 and CSO 020	Central Street (Western to Cliff) Cliff Street Hastings Hill (212 Hastings)	3,210	4,640		RF1-016 VT-267	$1,133,527.40
2007	CSO 027	Harvey Street	700	620		Constructed by PWD	
2010	CSO 020	Hastings Hill (212 Hastings to Mount Pleasant)	1,100	860	1,525	Rural Development	$781,264.43
2011-2012	CSO 027, CSO 024	Summer Street (Western to Church) Spring Street (Autumn to Church) Church Street Central Street (Cliff to Main)	5,760	4,760	5,235	Rural Development	$5,672,400.16

TABLE 2-6 cont.
SUMMARY OF WORK DONE TO DATE TO ELIMINATE CSOs

Year Comp.	CSO Impacted	Area	Description of Work			Funding Used	Construction Cost
			Sewer (LF)	Storm (LF)	Water (LF)		
2013-2014	CSO 027, CSO 024, CSO 020	Summer Street and Spring Street (Church to Mt Pleasant) Winter Street, Webster Street, Clinton Avenue, Mount Pleasant Street, Lynwood Terrace	8,110	6,980	6,900	Rural Development	$5,848,944.44
2013-2014	CSO 027, CSO 024, CSO 006	Eastern Avenue (Pearl to Main) Main Street Western Avenue	6,250	6,900	6,525	SRF RF1-168	$6,445,044.44
2013	CSO 027, CSO 023	Mount Vernon Street		175		VTrans STP BIKE (10)S	
2018-Current	CSO 016, CSO 021	Tremont Street, Emerson Street, Union Street, Russell Avenue, Southard Street, Oak Street and Buzzell Street	3,940	2,815	3,375	SRF RF1-153	$1,602.620.19
Design Phase	CSO 016	Pleasant Street, School Street, Dundee Street, Nelson Street, Gilman Avenue, Farmer Drive, Waterman Circle, Lawrence Circle and Concord Avenue	10,330 & dual sewer siphon	3,600	8,350		

SECTION 3
EXISTING CONDITIONS
PRELIMINARY ENGINEERING REPORT
COMBINED SEWER LONG TERM CONTROL PLAN
ST. JOHNSBURY, VERMONT
December 18, 2020

General

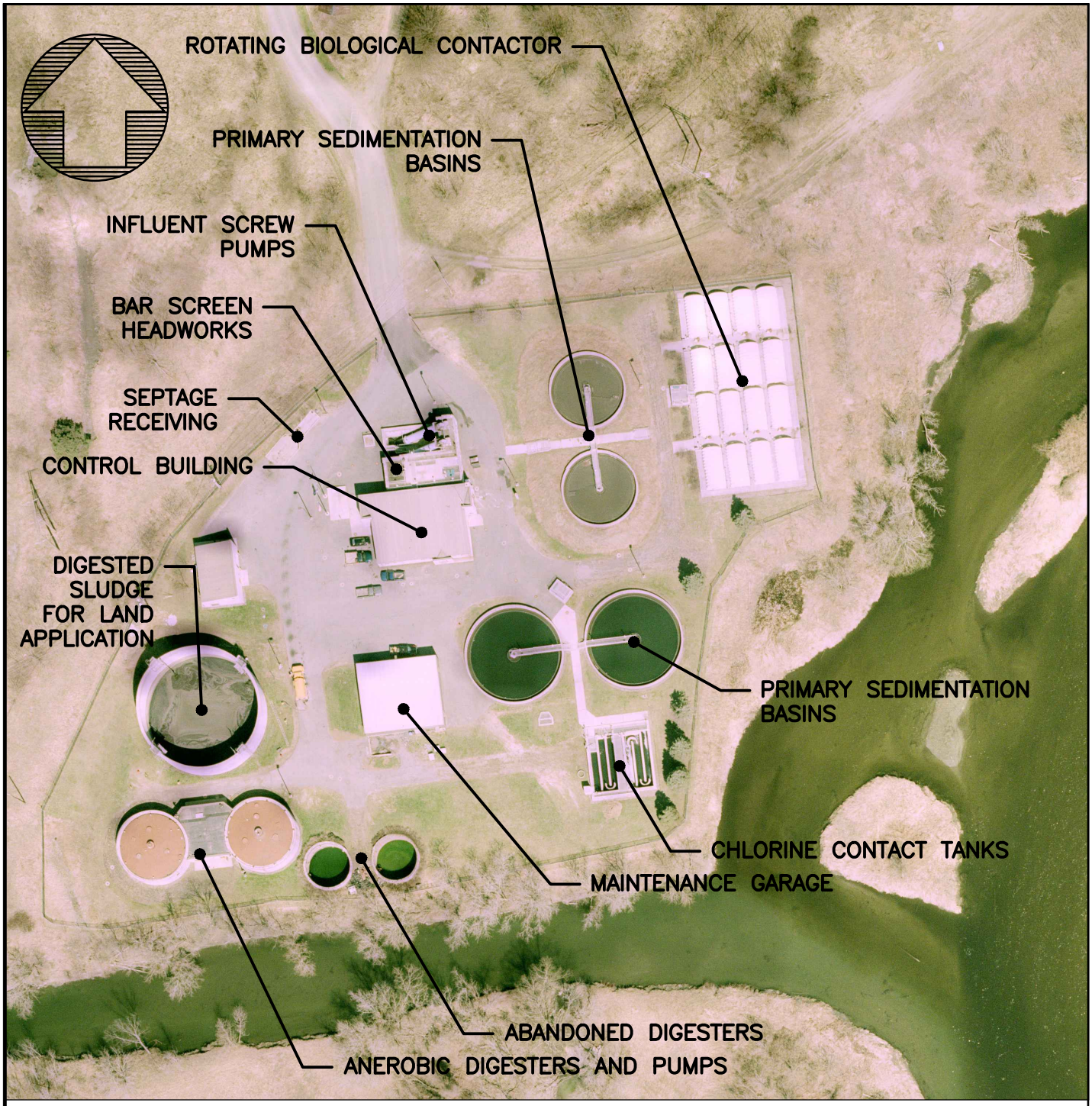
The existing combined sewer collection system was originally designed to discharge sanitary waste and storm water in a number of locations throughout the Town. As Federal regulations implemented pollution control programs, this practice needed to be eliminated. In 1963 the Town of St. Johnsbury constructed three interceptor sewer mains to collect the combined sewage and convey it to a treatment facility.

To avoid installing considerably massive mains, the interceptor mains were designed to pass the combined sewer and small storm events, while discharging excess flow from large storm events to the waterways. Since construction of the interceptor mains, additional regulations have been developed that make having CSO structures as part of the collection system a direct violation of the Environmental Protection Agency (EPA) Clean Water Act of 1972, the Vermont Water Quality Standards, Section 3.04(B)(3) and Discharge Permit No. 3-1290. The EPA released the National CSO Control Strategy on September 8, 1989, and then issued the Combined Sewer Overflow (CSO) Control Policy Notice on April 19, 1994. The State of Vermont issued the Combined Sewer Overflow Rule to replace the CSO Control Policy with the latest version effective September 15, 2016.

The Town of St. Johnsbury is currently functioning under a 1272 Order from the Vermont Agency of Natural Resources, which requires the development of a Long-Term Control Plan to evaluate alternatives to reduce and/or eliminate sewer overflow events. This section describes the existing combined sewer collection system.

Wastewater Treatment Facility

The Town of St. Johnsbury owns the Wastewater Treatment Facility that receives flow from the interceptor sewer mains on Bay Street, while operation and maintenance is contracted to Utility Partners. The wastewater treatment facility currently has a design capacity of 1.6 MGD, providing preliminary treatment, primary treatment, secondary treatment, disinfection, and dechlorination and operates under NPDES discharge permit number VT0100579. After treatment is complete, effluent is discharged into the Passumpsic River. The layout for the Wastewater Treatment Facility is shown in Figure 3-1.



GRAPHIC SCALE

100' 0 50' 100' 200' 400'

(IN FEET)

DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO 3-1

WASTEWATER TREATMENT FACILITY

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DEC. 18, 2020
DRAWING NO. FIG 1

FILE: J:\St. Johnsbury VT\3190007 CSO LTCP\CAD\Figures\Figure WWTF.DWG Dec 10, 2020 - 10:25am

Unit Process include:

- Two (2) 54-inch Enclosed Screw Pumps
- Coarse Bar Screen
- 25-inch Comminutor
- Fine Bar Screen
- Aerated Grit Chamber
- Flow Splitter
- Two (2) Chlorinators
- Two (2) Sulfonators
- Sludge Pumps
- Water Pumps
- Influent Pumps
- Effluent Pumps
- Two (2) 45-foot diameter Primary Clarifiers
- Sixteen (16) Rotating Biological Contactors
- Two (2) 60-foot diameter Secondary Clarifiers
- 2,000 Gallon Chlorine Contact Chamber
- Grit Dewatering Unit
- Two (2) 45-foot diameter Anaerobic Digesters
- Two (2) Gas Compressors
- 80-foot diameter Sludge Storage Tank
- Two (2) 30-foot diameter Sludge Storage Tanks

Collection System

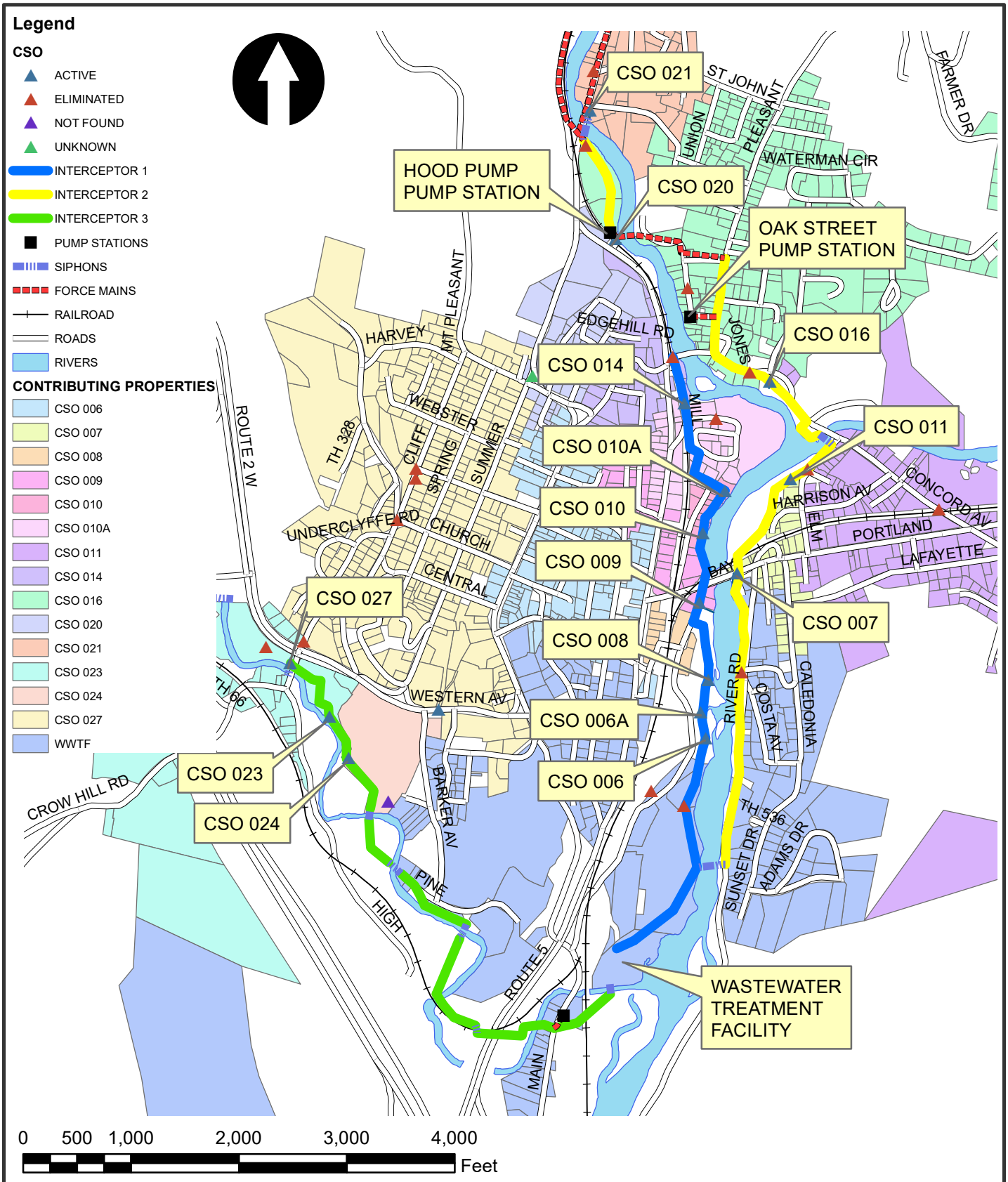
The Town of St. Johnsbury combined sewer collection system incorporates approximately 28 miles of collection mains with over 640 access structures. Three major interceptor mains convey the combined sewage to the wastewater treatment facility and are described in Table 3-1 below and shown in Figure 3-2.

TABLE 3-1
INTERCEPTOR DESCRIPTION

Interceptor	Location	Length (ft)	Conveyance Type	Number of CSO
1	Passumpsic River Western Shore	6,225	Gravity	7
2	Passumpsic River Eastern Shore	7,360	Gravity with 3 Siphons and 1 Force Main	5
3	Sleepers River	5,090	Gravity with 7 Siphons	3

The National Pollutant Discharge Elimination System (NPDES) has issued the Town of St. Johnsbury a permit for 26 Combined Sewer Overflow (CSO) structures. There are

currently 15 CSO structures and the wastewater treatment plant that have the ability to discharge. The location of those structures is shown in Figure 3-2 and each structure is discussed in detail on the following pages of this section. Table 3-2 lists all the CSO structures, their location, receiving water and status.



DUFRESNE GROUP
CONSULTING ENGINEERS

459 Portland Street, Suite 106
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605 Fax: (802) 748-4512
E-mail: dufresne@vermontel.net
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-2

COMBINED SEWER COLLECTION INTERCEPTOR MAP

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO OVERVIEW

TABLE 3-2
COMBINED SEWER OVERFLOWS

CSO #	Location	Receiving Water	Status
001	**WWTF**	**Passumpsic River**	**WWTF Regulated Outfall**
002	WWTF	Passumpsic River	Eliminated prior to 1990
003	Intersection Ely & State Street	Moose River	Eliminated June 2002
005	Bay Street	Passumpsic River	Eliminated Aug 2006
005A	Bay Street	Passumpsic River	Eliminated Aug 2006
006	**Bay Street**	**Passumpsic River**	**In use**
006A	**Bay Street**	**Passumpsic River**	**In use**
007	**Intersection River & Bay**	**Passumpsic River**	**In use**
008	**Bay Street**	**Passumpsic River**	**In use**
009	**Bay Street**	**Passumpsic River**	**In use**
010	**St. Mary's Street**	**Passumpsic River**	**In use**
010A	**St. Mary's Street**	**Passumpsic River**	**In use**
011	**Elm Street**	**Passumpsic River**	**In use**
014	**Mill Street**	**Passumpsic River**	**In use**
014A	Concord Avenue	Passumpsic River	Eliminated June 2009
015	Perkins Street	Passumpsic River	Eliminated June 2009
016	**Concord Avenue**	**Passumpsic River**	**In use**
016A	Concord Avenue	Passumpsic River	Eliminated August 2009
019	Oak Street Pump Station	Passumpsic River	Eliminated 1993
020	**Hood Pump Station**	**Passumpsic River**	**In use**
021	**Intersection of Tremont and Passumpsic Street**	**Passumpsic River**	**In use**
023	**Southeast of 401 Western Avenue**	**Sleeper River**	**In use**
024	**South of St. Johnsbury School**	**Sleeper River**	**In use**
025	Western Avenue	Sleeper River	Eliminated date unknown
026	Intersection of Western and Central Street	Sleeper River	Eliminated Sept. 1992
027	**Intersection Western and Mount Vernon**	**Sleeper River**	**In use**

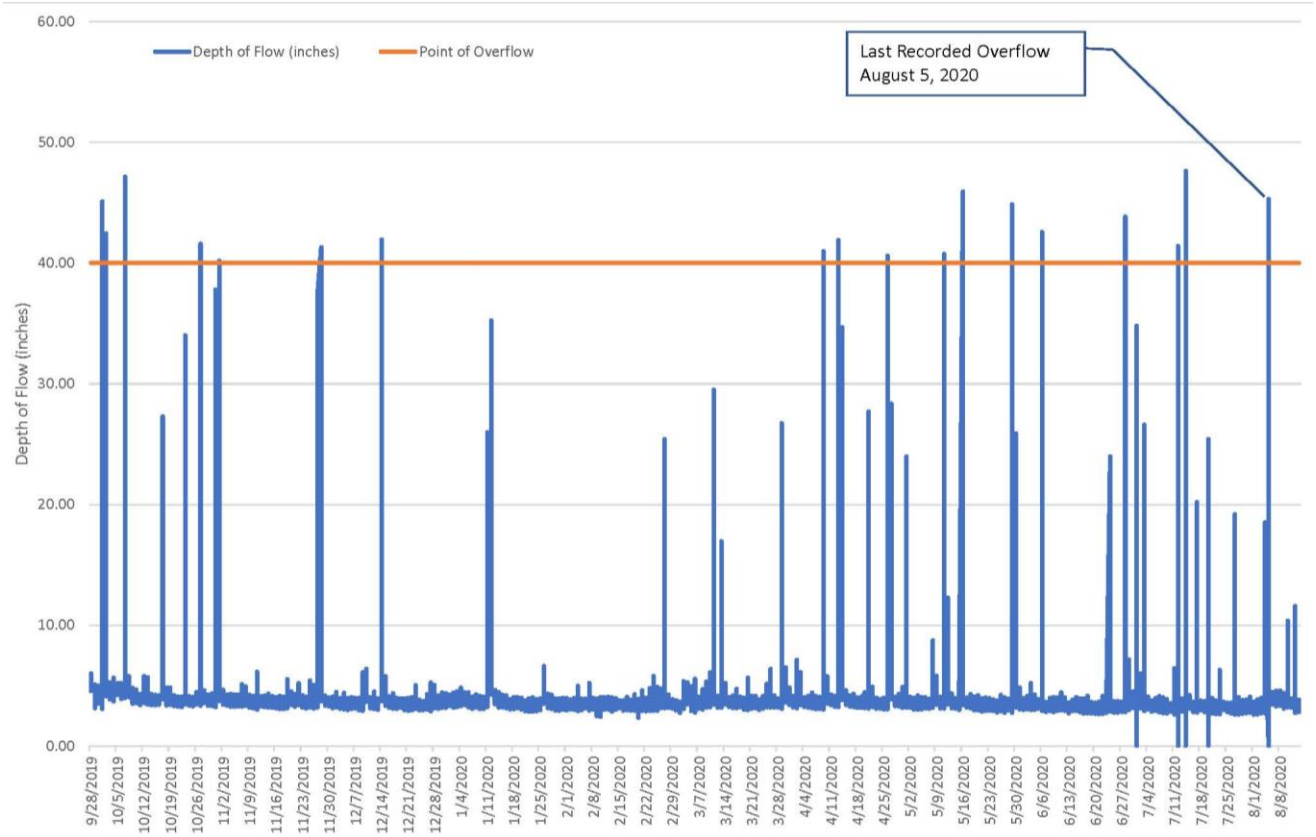
CSO 006

Image 3-1 - CSO 006

CSO 006 is located off Bay Street approximately 250 feet south of the Green Mountain Power substation on Interceptor 1. The precast concrete structure has a 14" AC inlet and outlet with a 30" CMP overflow pipe that has a 15" concrete weir. The top of the weir is 40" above the invert out of the manhole, as shown in Image 3-1.

It is an active combined sewer overflow with a BlueSiren flow monitoring device installed. The BlueSiren records the depth of flow in the overflow every 30 minutes. When a high alarm has been triggered, the BlueSiren device increases readings to every five minutes. The last reported overflow on the BlueSiren recorder was August 5, 2020, as shown in Image 3-2.

IMAGE 3-2
CSO 006 BLUESIREN DATA



The primary combined sewer area contributing to CSO 006 is shown in Figure 3-3. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 1. For this evaluation, we used a peaking factor of 3.8 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

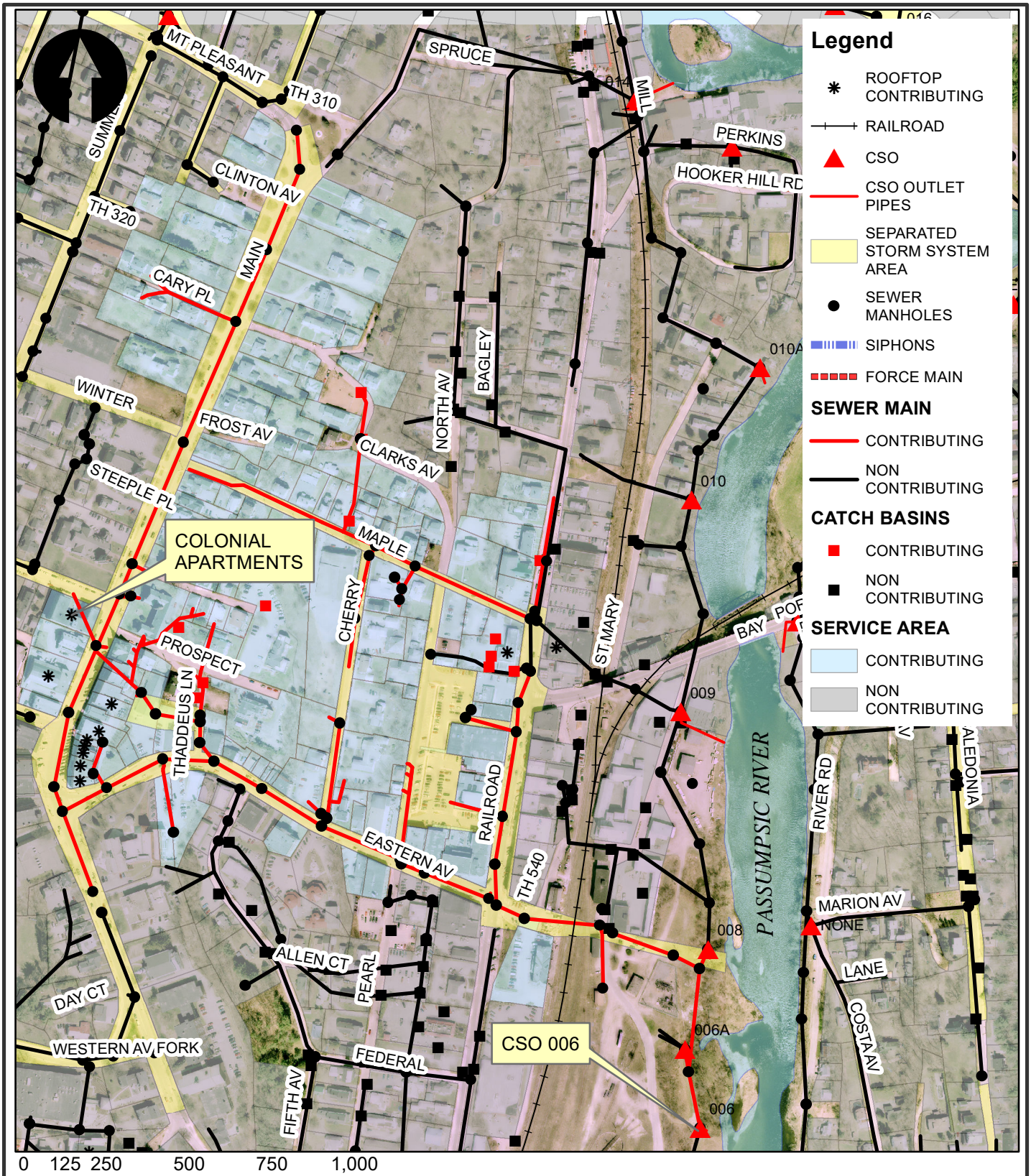
- Total Contributing Properties: 144
- Average Daily Flow: 96,400 GPD
- Maximum Daily Flow: 366,310 GPD
- Instantaneous Peak Flow: 260 GPM

A large portion of the contributing area has been upgraded as part of several projects that have separated stormwater from the combined sewer collection system and a majority (77.2%) of the contributing mains are constructed of polyvinyl chloride (PVC) pipe, as shown in Table 3-3.

TABLE 3-3
CSO 006 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
4	925					**925**	**5.2**
6	705	2,075				**2,780**	**15.7**
8	10,835					**10,835**	**61.4**
10	25					**25**	**0.1**
12	25					**25**	**0.1**
14			555			**555**	**3.1**
15	1,020	350				**1,370**	**7.8**
18	80					**80**	**0.5**
24					380	**380**	**2.2**
30	10			670		**680**	**3.9**
Total Linear Feet	**13,625**	**2,425**	**555**	**670**	**380**	**17,655**	
% of Total	**77.2**	**13.7**	**3.1**	**3.8**	**2.2**		

There are twelve catch basins believed to be connected to the combined sewer in the contributing area. Although several of the buildings in the contributing area have had their roof drains diverted to the storm system, the following buildings are believed to be contributing stormwater to the combined system:



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE 3-3

CSO 006
CONTRIBUTING AREA

SAINT JOHNBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. 1 OF 1

- Church Street: 17 (Colonial Apartments)
- Main Street: 1184, 1194, 1204, 1214, 1222, 1229, 1236 and 1249
- Railroad Street: 497 (Passumpsic Bank)

CSO 006 is the first CSO on Interceptor 1 and receives flow from CSO 008, 009, 010, 010A and 014. Based on modeling completed in HydroCAD 10.00-22, CSO 006 overflows as shown in Table 3-4.

TABLE 3-4
CSO 006 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	2,830	1,840	990	57	20,185
5-Year	2.96	3,609	1,885	1,724	114	54,005
10-Year	3.46	3,952	1,904	2,048	147	73,540
25-Year	4.15	4,418	1,928	2,491	207	103,045
50-Year	4.67	4,782	1,945	2,837	264	128,025
100-Year	5.22	5,184	1,963	3,221	327	156,522

CSO 006A

CSO 006A is a 6'x6' poured-in-place concrete structure with two inlet pipes and an outlet pipe that discharges to a manhole on the Interceptor 1. The overflow pipe discharges to a headwall with a flap gate installed approximately 18-feet from the structure.

This structure has been inspected on a number of occasions with no flow observed, most recently on August 13, 2020. During this inspection, both inlets and the outlet were filled with sediment with no signs of flow, as shown in Images 3-3 and 3-4. There did appear to be some dampness in the overflow pipe, however where that maybe coming from is unclear. Town officials have reported that this structure has been overflowing based on a tell-tale device and believe that the trunkline is surcharging up to CSO 006A.

Image 3-3 - CSO 006A Inlet

Image 3-4 - CSO 006A Outlet

A map of St. Johnsbury Sewers dated September 25, 1956 showed two 20-inch mains coming from Eastern Avenue through this area, while the 1962 proposed sewerage system plans show a 20-inch VC and 18-inch VC main contributing to this structure. Since then several improvement projects on Railroad Street and Eastern Avenue have been completed and it is not believed that this structure has any contributing sewer services or stormwater collection.

CSO 007

CSO 007 is located on the lower level of Portland Street on the east side of the bridge and discharges from the bottom of the structure to Interceptor 2, with an overflow to a storm manhole that discharges to the Passumpsic River. The precast concrete structure has an 18" VCP inlet and overflow pipe close in elevation, as shown in Image 3-5.

Monitoring is done using a telltale device placed in the overflow pipe.

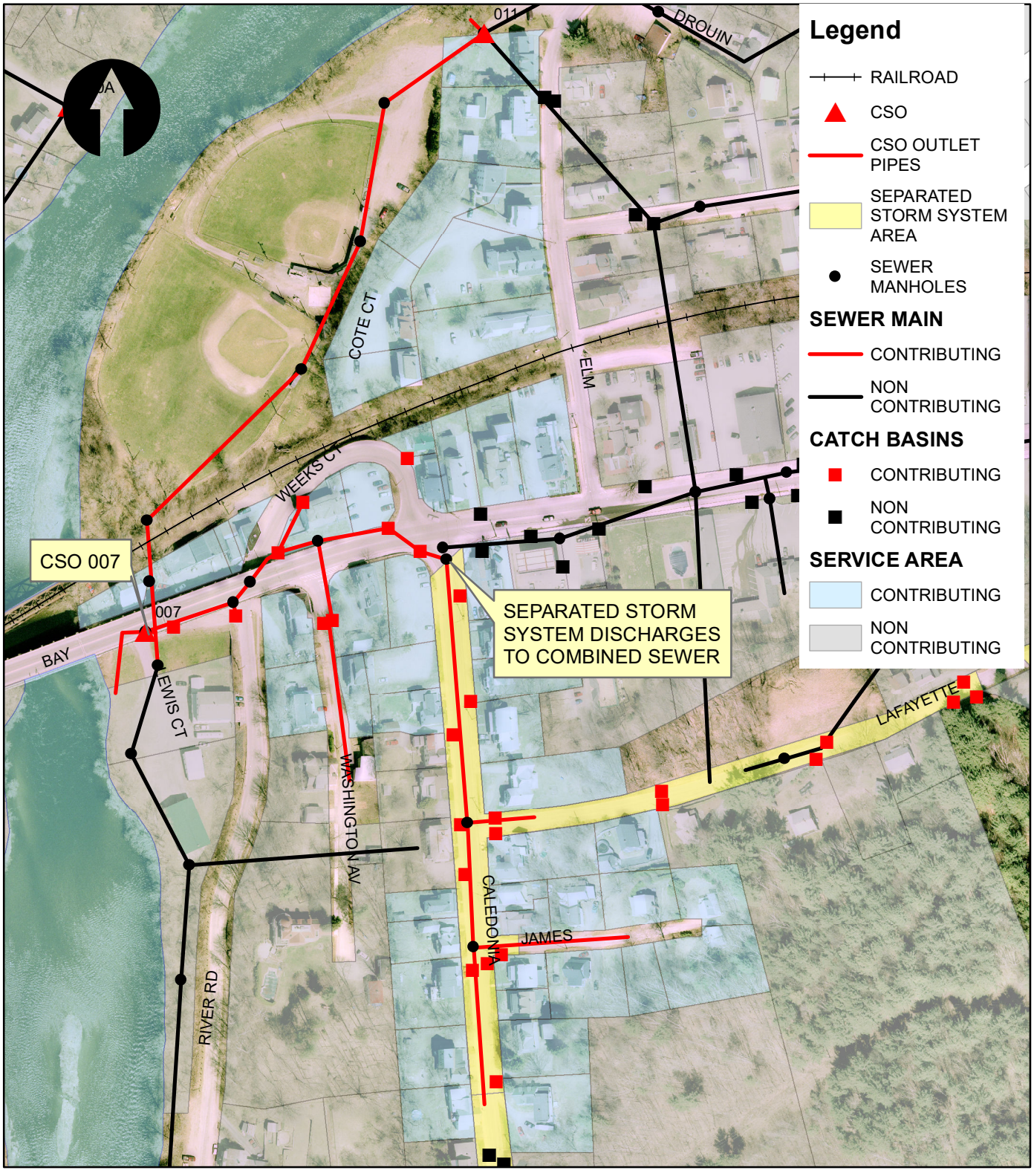
Image 3-5 - CSO 007

Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020, this structure had 16 reported overflows.

The primary combined sewer area contributing to CSO 007 is shown in Figure 3-4. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 2. For this evaluation, we used a peaking factor of 4.15 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 50
- Average Daily Flow: 21,990 GPD
- Maximum Daily Flow: 91,300 GPD
- Instantaneous Peak Flow: 63 GPM

A large portion of the contributing area has been upgraded with a separated stormwater system, but unfortunately it is connected to the combined sewer collection system at the intersection of Caledonia Street and Portland Street instead of discharging to a waterway. The combined sewer collection mains contributing to CSO 007 are typically older with a majority (39.1%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-5.



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-4

CSO 007
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO.	3190007
PROJECT MJR.	AJD
SCALE	AS SHOWN
DATE	DECEMBER 18, 2020
DRAWING NO.	CSO 007.MXD

TABLE 3-5
CSO 007 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		790				**790**	**24.7**
8	810					**810**	**25.3**
18		460				**460**	**14.4**
20			1,140			**1,140**	**35.6**
Total Linear Feet	**810**	**1,250**	**1,140**			**3,200**	
% of Total	**25.3**	**39.1**	**35.6**				

There are 27 catch basins within the Town right-of-way and no known roof drains believed to be connected to the combined sewer in the contributing area. The estimated contributing area is 4.6 acres. Although Caledonia Street and Washington Avenue has designated storm drains on them, both streets discharge into the combined sewer system.

Because CSO 007 is not on an Interceptor it does not receive flow from any other CSO. Based on modeling completed in HydroCAD 10.00-22, CSO 007 overflows as shown in Table 3-6.

TABLE 3-6
CSO 007 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	2,460	870	1,590	276	33,930
5-Year	2.96	4,115	1,160	2,955	528	76,370
10-Year	3.46	5,020	1,340	3,680	651	101,970
25-Year	4.15	6,320	1,620	4,700	936	140,490
50-Year	4.67	6,975	1,760	5,215	962	171,510
100-Year	5.22	6,930	1,750	5,180	1,013	205,650

CSO 008

CSO 008 is located east of Allen Lumber on Interceptor 1 and discharges to the Passumpsic River. The precast concrete structure has a 10” AC inlet and outlet with a 12” PVC overflow pipe approximately 3.8-feet above the outlet, as shown in Image 3-6.

Monitoring is done using a telltale device placed in the overflow pipe.
Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had 17 reported overflows.

The primary combined sewer area contributing to CSO 008 is shown in Figure 3-5. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 3. For this evaluation, we used a peaking factor of 4.13 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

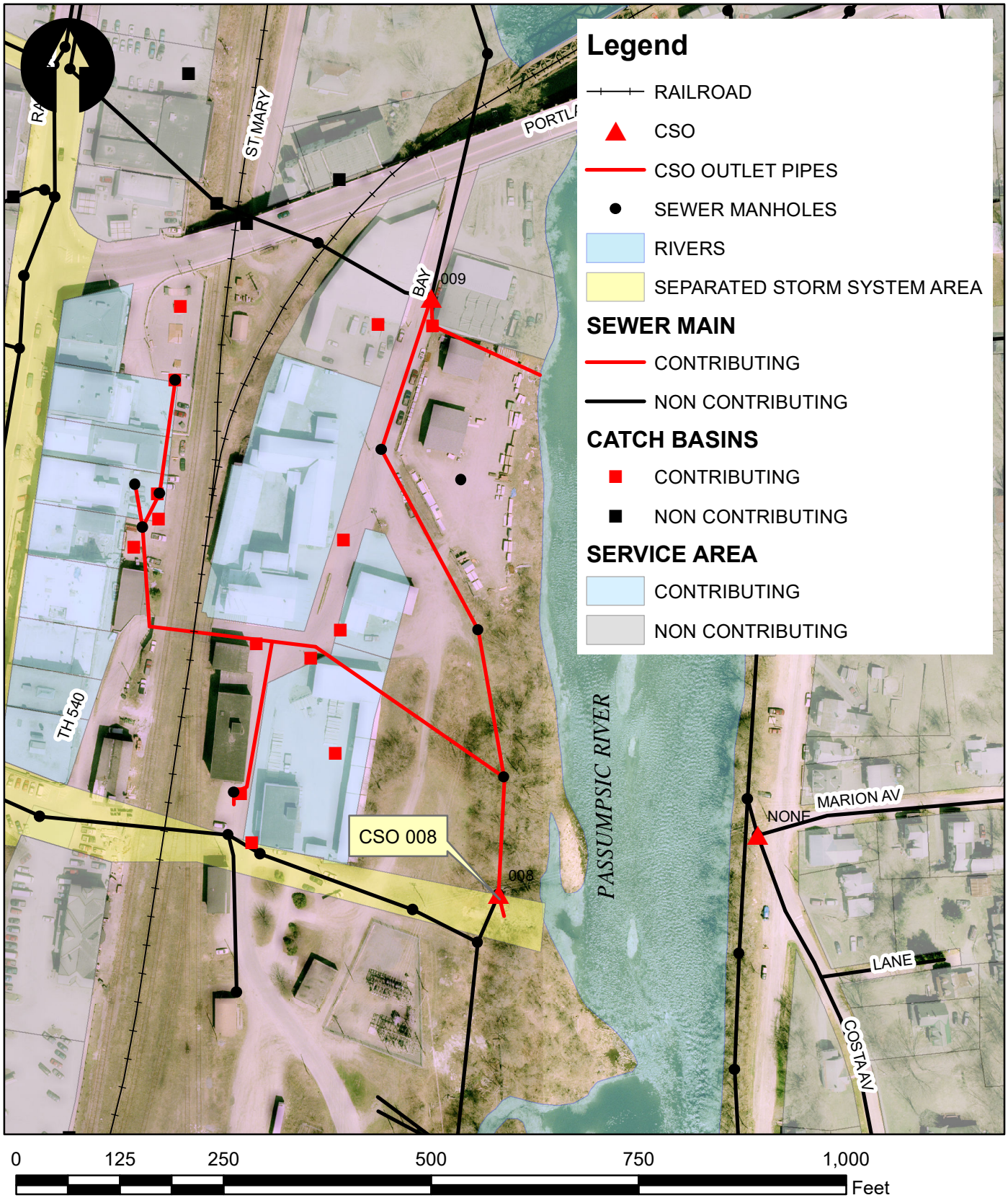
Image 3-6 - CSO 008

- Total Contributing Properties: 12
- Average Daily Flow: 26,230 GPD
- Maximum Daily Flow: 108,350 GPD
- Instantaneous Peak Flow: 75 GPM

A large portion of the contributing main is a cross lot main that collects the historic buildings on the east side of Railroad Street. The combined sewer collection mains contributing to CSO 008 are typically older with a majority (51.2%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-7.

TABLE 3-7
CSO 008 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		840				**840**	**51.2**
10			800			**800**	
Total Linear Feet		**840**	**800**			**1,640**	**48.8**
% of Total		**51.2**	**48.8**				



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-5

CSO 008
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 008.MXD

There are 14 catch basins, seven within the Town right-of-way and seven private, believed to be connected to the combined sewer in the contributing area. There are no known roof drains connected, as they were provided stormwater connections as part of the 1984 Central Business District Improvement Project. The area contributing to this CSO is approximately 5.8 acres.

CSO 008 is the second CSO on Interceptor 1 and receives flow from CSO 009, 010, 010A and 014. Based on modeling completed in HydroCAD 10.00-22, CSO 008 overflows as shown in Table 3-8.

TABLE 3-8
CSO 008 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	1,895	1,895	1,895	0	0
5-Year	2.96	2,692	2,119	572	15	3,987
10-Year	3.46	3,075	2,181	894	15	6,818
25-Year	4.15	3,377	2,230	1,146	21	10,684
50-Year	4.67	3,615	2,283	1,332	27	13,691
100-Year	5.22	3,870	2,326	1,545	33	16,970

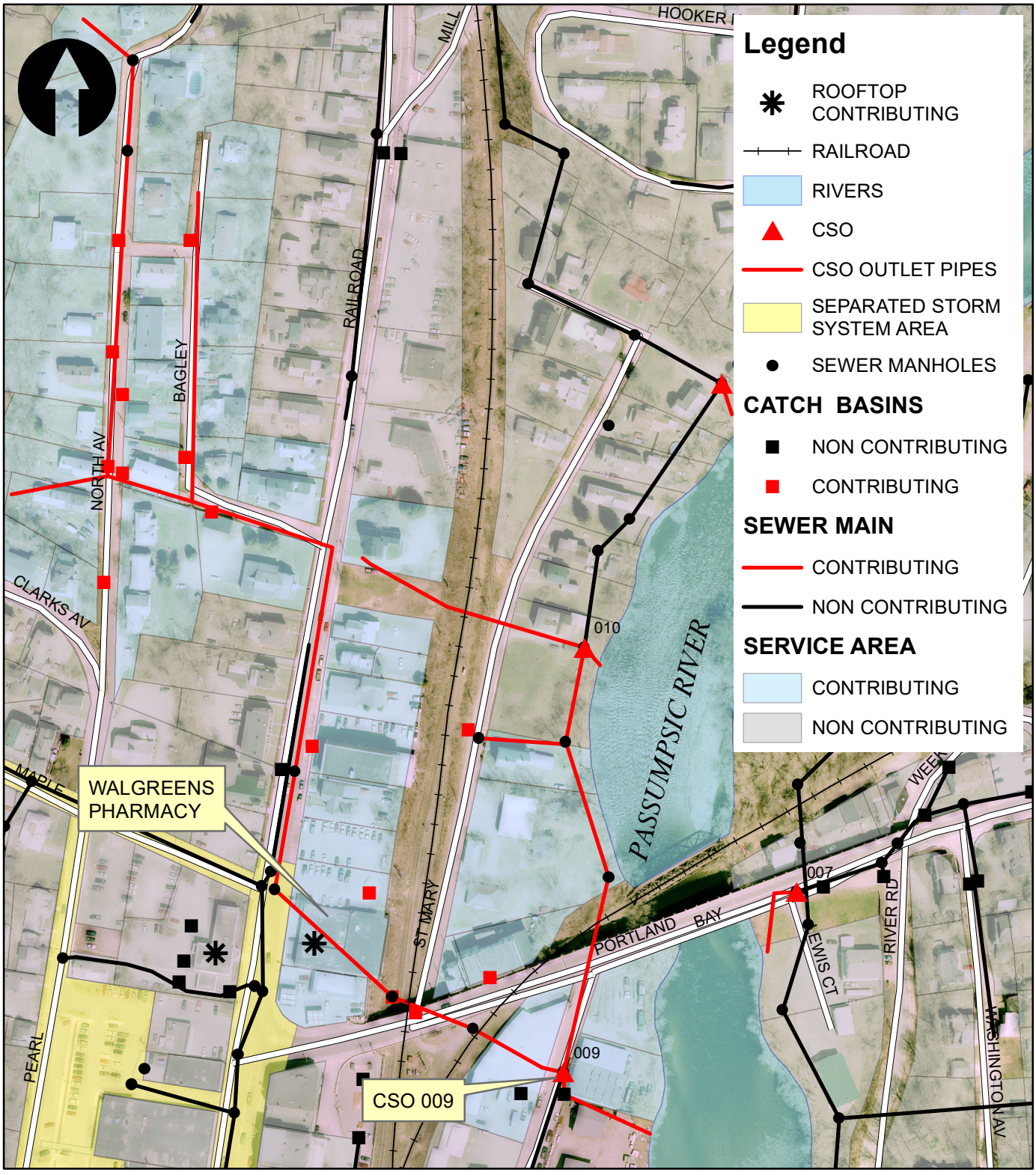
CSO 009

CSO 009 is located on the north end of Bay Street on Interceptor 1 and discharges to a catch basin that discharges to the Passumpsic River. The precast concrete structure has a 10” AC inlet and outlet with an 8” PVC overflow pipe approximately 2.5-feet above the outlet. The original overflow pipe was a 12” VC pipe that has been plugged, as shown in Image 3-7.

Image 3-7 - CSO 009

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between June of 2019 and August of 2020 this structure had 23 reported overflows.

The primary combined sewer area contributing to CSO 009 is shown in Figure 3-6. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 4. For this evaluation, we used a peaking factor of 4.16 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-6

CSO 009
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 009.MXD

- Total Contributing Properties: 43
- Average Daily Flow: 17,820 GPD
- Maximum Daily Flow: 74,150 GPD
- Instantaneous Peak Flow: 50 GPM

A large portion of the contributing main is a cross lot main that collects the buildings on the east side of Railroad Street, as well as Bagley Street and North Avenue. The combined sewer collection mains contributing to CSO 009 are typically older with a majority (82.9%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-9.

TABLE 3-9
CSO 009 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		1,430				**1,430**	**37.1**
10			660			**660**	**17.1**
12		1,470				**1,470**	**38.2**
18		290				**290**	**7.5**
Total Linear Feet		**3,190**	**660**			**3,850**	
% of Total		**82.9**	**17.1**				

There are 15 catch basins and roof drains from Walgreens Pharmacy (502 Railroad Street) believed to be connected to the combined sewer in the contributing area. CSO 009 contributing area is approximately 8.5 acres, including parts of the Portland Street bridge, Railroad Street, and the Bagley Street neighborhood.

CSO 009 is on Interceptor 1 and receives flow from CSO 010, 010A and 014. Based on modeling completed in HydroCAD 10.00-22, CSO 009 overflows as shown in Table 3-10.

TABLE 3-10
CSO 009 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	2,552	1,212	1,340	57	37,732
5-Year	2.96	4,423	2,009	2,414	108	111,300
10-Year	3.46	5,298	2,392	2,906	144	156,585
25-Year	4.15	5,983	2,694	3,289	219	226,108
50-Year	4.67	6,523	2,932	3,591	273	284,885
100-Year	5.22	7,101	3,187	3,913	282	350,961

CSO 010

CSO 010 is located east of 120 St. Mary's Street on Interceptor 1 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure has a 10" AC inlet and outlet with an 8" PVC overflow pipe approximately 2-inches above the outlet. A 12-inch high brick berm has been constructed to reduce the frequency of discharges, as shown in Image 3-8.

Image 3-8 - CSO 010

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between June of 2019 and August of 2020 this structure had 25 reported overflows.

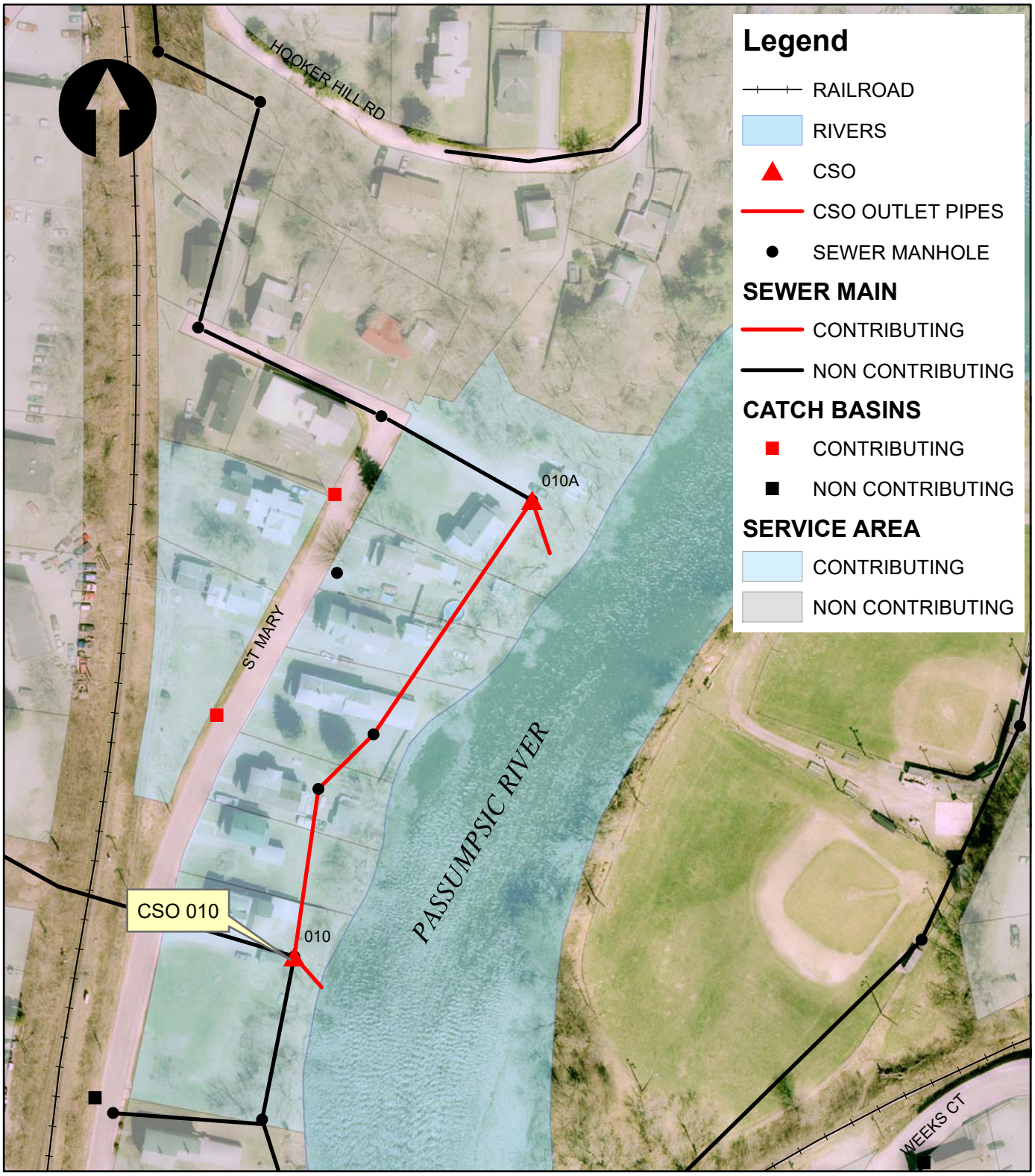
The primary combined sewer area contributing to CSO 010 is shown in Figure 3-7. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 5. For this evaluation, we used a peaking factor of 5 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 9
- Average Daily Flow: 4,400 GPD
- Maximum Daily Flow: 22,000 GPD
- Instantaneous Peak Flow: 15 GPM

The contributing main is the Interceptor 1 main. The combined sewer collection mains contributing to CSO 010 were installed in 1963 and are asbestos cement pipe, as shown in Table 3-11.

TABLE 3-11
CSO 010 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
10			610			**610**	**100**
Total Linear Feet			**610**			**610**	
% of Total			**100**				



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-7

CSO 010
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 010.MXD

There are two catch basins within the Town right-of-way and no roof drains believed to be connected to the combined sewer in the contributing area. Although, CSO 010 has an 8-inch inlet that maybe receiving flow from Bagley Street and North Avenue, as shown in the 1956 St. Johnsbury Sewers map, this cannot be verified. Based on CCTV inspection, a main that contributes to CSO 009 is collecting some of the Bagley Street flow. CSO 010 is on Interceptor 1 and receives flow from CSO 010A and 014. Based on modeling completed in HydroCAD 10.00-22, CSO 010 overflows as shown in Table 3-12.

TABLE 3-12
CSO 010 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	1,361	636	725	20	7,610
5-Year	2.96	2,124	854	1,270	39	17,725
10-Year	3.46	2,545	987	1,560	49	23,665
25-Year	4.15	3,147	1,183	1,964	58	31,850
50-Year	4.67	3,612	1,340	2,275	69	38,185
100-Year	5.22	4,110	1,510	2,600	88	45,755

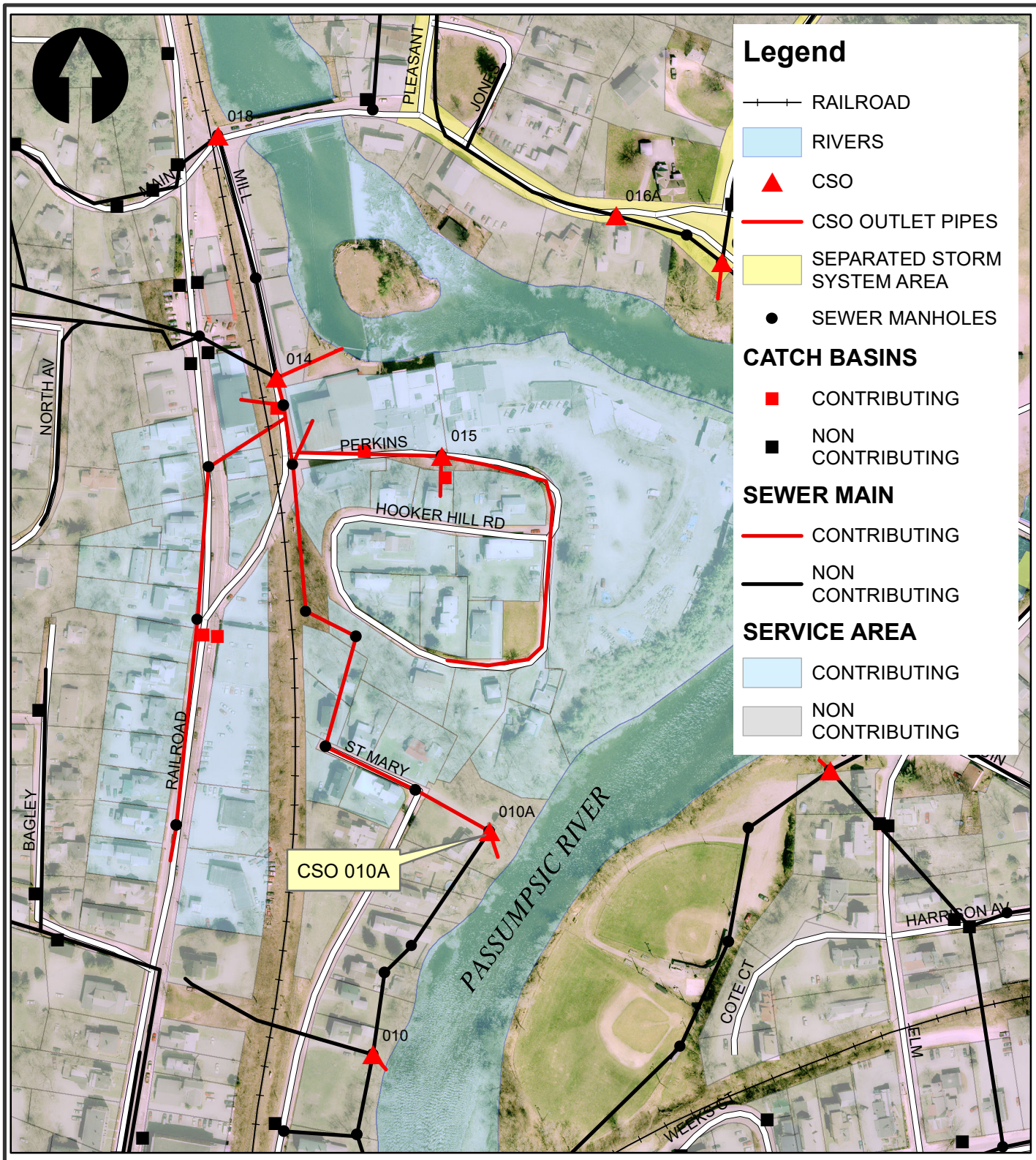
CSO 010A

CSO 010A is located east of 206 St. Mary's Street on Interceptor 1 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure has a 10" AC inlet and outlet with an 8" PVC overflow pipe approximately 7-inches above the outlet. A 12-inch high brick berm has been constructed to reduce the frequency of discharges, as shown in Image 3-9.

Image 3-9 - CSO 010A

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between June of 2019 and August of 2020 this structure had 15 reported overflows.

The primary combined sewer area contributing to CSO 010A is shown in Figure 3-8. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 6. For this evaluation, we used a peaking



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-8

CSO 010A
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 010A.MXD

factor of 4.18 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 41
- Average Daily Flow: 14,950 GPD
- Maximum Daily Flow: 62,500 GPD
- Instantaneous Peak Flow: 43 GPM

The contributing main is the Interceptor 1 main, Perkins Street and Railroad Street from Bagley Street to Mill Street. The combined sewer collection mains contributing to CSO 010A are typically older with a majority (66.6%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-13.

TABLE 3-13
CSO 010A COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		1,550				**1,550**	**52.5**
8			985			**985**	**33.4**
12		415				**415**	**14.1**
Total Linear Feet		**1,965**	**985**			**2,950**	
% of Total		**66.6**	**33.4**				

There are five catch basins connected and no roof drains are believed to be connected to the combined sewer in the contributing area. CSO 010A contributing area is approximately 1.9 acres.

CSO 010A is on Interceptor 1 and receives flow from CSO 014. Based on modeling completed in HydroCAD 10.00-22, CSO 010A overflows as shown in Table 3-14.

TABLE 3-14
CSO 010A COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	1,162	618	544	15	3,966
5-Year	2.96	2,364	1,007	1,356	24	15,220
10-Year	3.46	2,990	1,235	1,755	36	22,688
25-Year	4.15	3,898	1,574	2,324	48	34,421
50-Year	4.67	4,600	1,840	2,760	57	43,863
100-Year	5.22	5,352	2,128	3,225	63	54,125

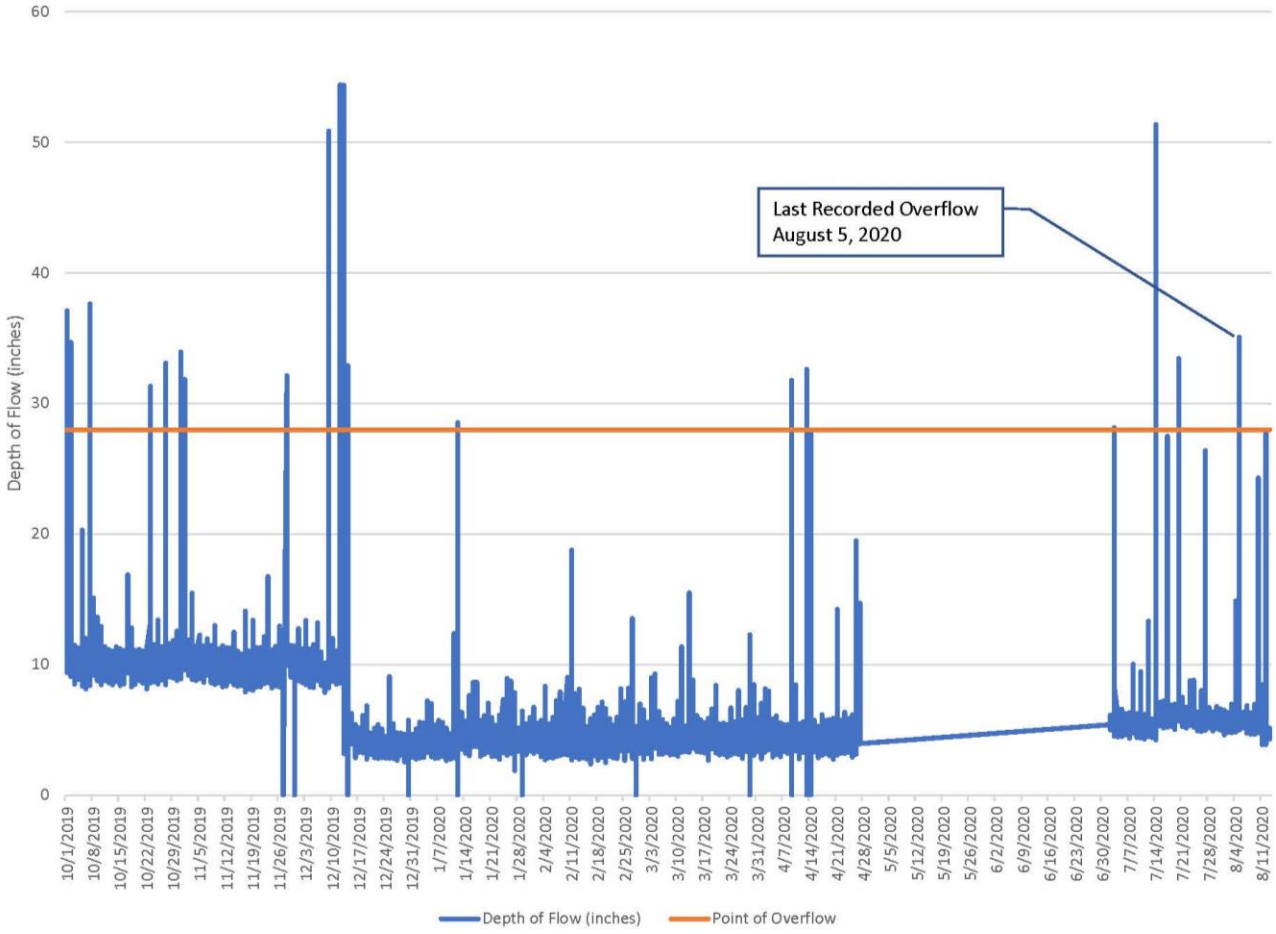
CSO 011

CSO 011 is located on Elm Street in the American Legion baseball field access drive on Interceptor 2 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure has a 20" AC inlet and outlet with a 20" VC overflow pipe approximately 20-inches above the outlet. An 8-inch weir has been constructed in the overflow pipe to reduce the frequency of discharges, as shown in Image 3-10.

Image 3-10 - CSO 011

CSO 011 is an active combined sewer overflow with a BlueSiren flow monitoring device installed. The BlueSiren records the depth of flow in the overflow every 30 minutes. When a high alarm has been triggered, the BlueSiren device increases readings to every five minutes. The last reported overflow on the BlueSiren recorder was August 5, 2020, as shown in Image 3-11.

IMAGE 3-11
CSO 011 BLUESIREN DATA



In December of 2019, H. A. Manosh was onsite to clean and inspect the sewer main in the area of CSO 011. It was found that the mains had a significant amount of sediment. Removal of the sediment resulted in a drop in average flow from approximately 10-inches to 4-inches. However, December 12, 2019 and December 13, 2019 readings are invalid because the sensor was knocked out of alignment during the cleaning process. Readings between April 27, 2020 through July 2, 2020 were not recorded because the battery in the BlueSiren required replacement.

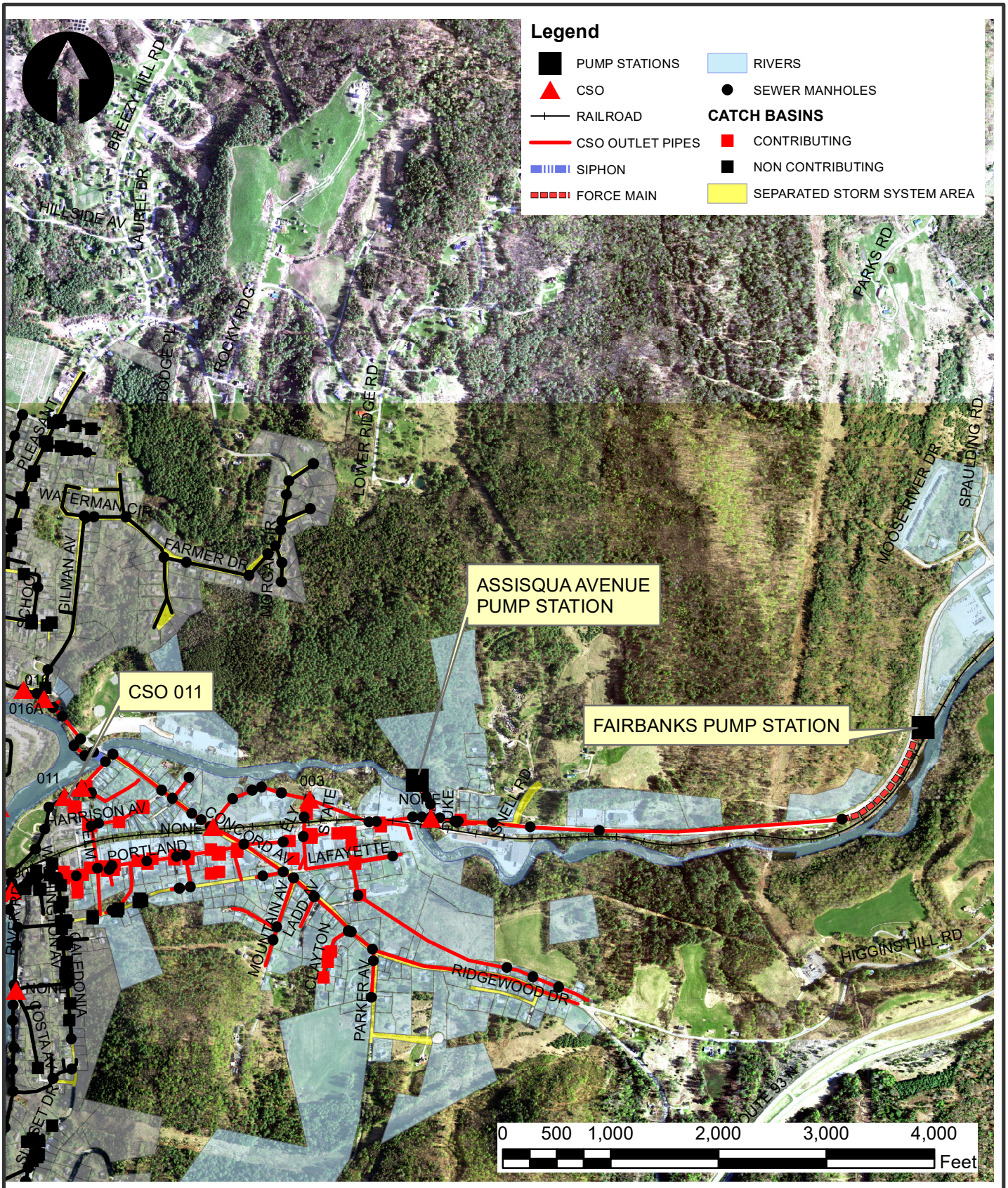
The primary combined sewer area contributing to CSO 011 is shown in Figure 3-9. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 7. For this evaluation, we used a peaking factor of 3.8 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 287
- Average Daily Flow: 105,725 GPD
- Maximum Daily Flow: 401,755 GPD
- Instantaneous Peak Flow: 280 GPM

The contributing area for CSO 011 incorporates some of the oldest infrastructure in the system with limited access and several cross-lot mains. The combined sewer collection mains contributing to CSO 011 are typically older with a majority (95.9%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-15.

TABLE 3-15
CSO 011 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		5,940				**5,940**	**23.3**
8	115	9,990				**10,105**	**39.6**
12		6,120				**6,120**	**24.0**
14			475			**475**	**1.9**
15		1,190				**1,190**	**4.7**
18		1,220	285			**1,505**	**5.9**
20			175			**175**	**0.7**
Total Linear Feet	**115**	**24,460**	**935**			**25,510**	
% of Total	**0.5**	**95.9**	**3.7**				



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-9

CSO 011
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 011.MXD

There are 53 catch basins and no roof drains believed to be connected to the combined sewer in the contributing area. There is approximately 26.0 acres contributing to CSO 011.

CSO 011 is on Interceptor 2 and receives flow from CSO 016, however there is a single siphon between CSO 016 and 011. This single 8-inch siphon limits flow from the CSO 016 drainage area to 1116 gpm. Based on modeling completed in HydroCAD 10.00-22, CSO 011 overflows as shown in Table 3-16.

TABLE 3-16
CSO 011 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	5,087	4,288	799	13	5,990
5-Year	2.96	8,135	5,120	3,015	40	102,092
10-Year	3.46	8,145	5,123	3,023	65	172,430
25-Year	4.15	8,150	5,125	3,025	104	288,645
50-Year	4.67	8,114	5,115	3,000	138	387,521
100-Year	5.22	8,180	5,130	3,050	176	499,790

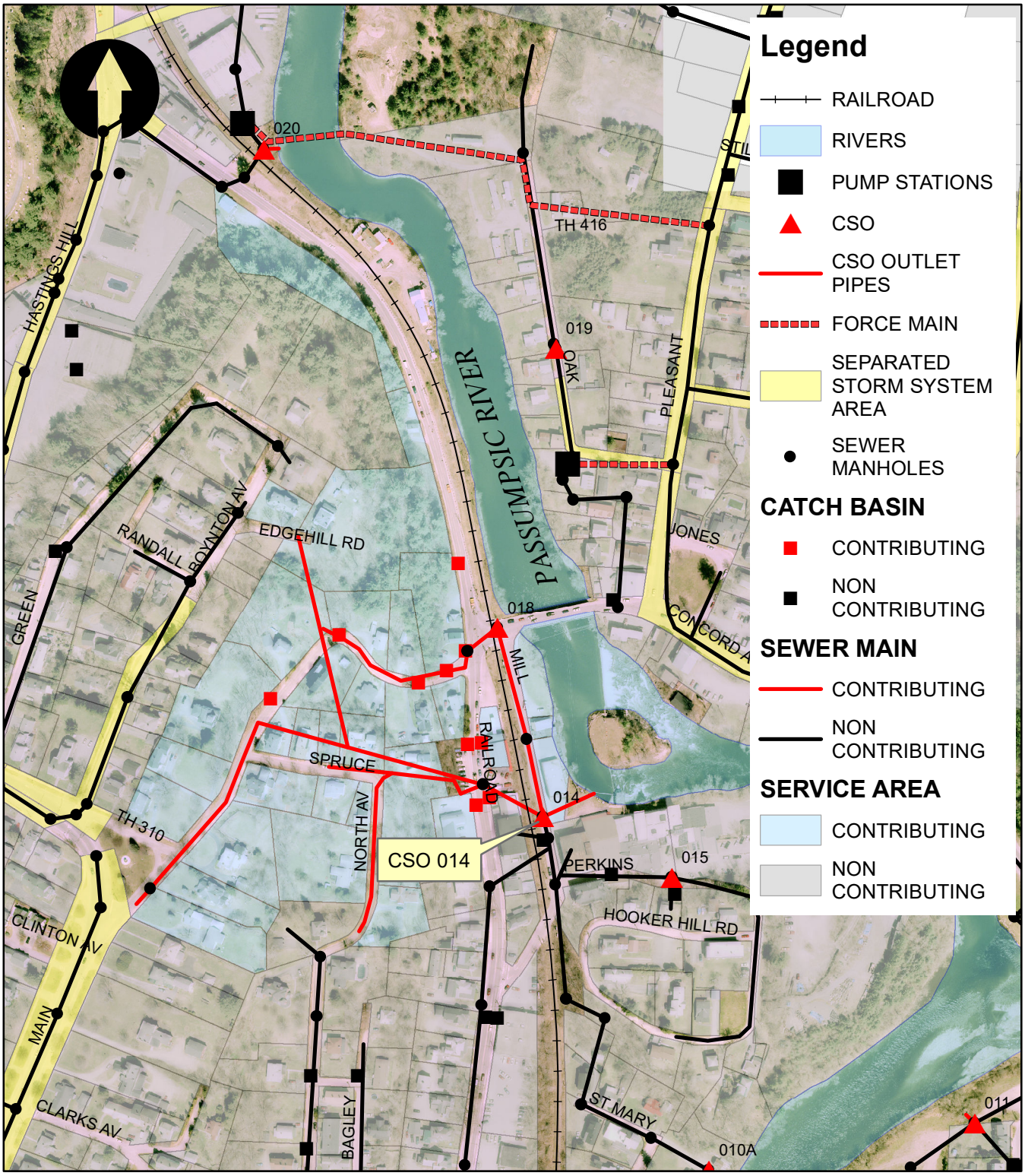
CSO 014

CSO 014 is located adjacent to 98 Mill Street on Interceptor 1 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure has an 8” AC inlet and outlet with a 12” VC overflow pipe approximately 4-inches above the outlet. An 8-inch high brick berm has been constructed to reduce the frequency of discharges, as shown in Image 3-12.

Image 3-12 - CSO 014

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had 15 reported overflows.

The primary combined sewer area contributing to CSO 014 is shown in Figure 3-10. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 8. For this evaluation, we used a peaking factor of 5 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:



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481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-10

CSO 014
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 014.MXD

- Total Contributing Properties: 33
- Average Daily Flow: 8,520 GPD
- Maximum Daily Flow: 42,600 GPD
- Instantaneous Peak Flow: 30 GPM

The contributing main for this CSO is typically older with a majority (89.3%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-17.

TABLE 3-17
CSO 014 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6	95	2,840				**2,935**	**92.3**
8			445			**245**	**7.7**
Total Linear Feet	**95**	**2,840**	**445**			**3,180**	
% of Total	**3.0**	**89.3**	**7.7**				

There are ten catch basins believed to be connected to the combined sewer in the contributing area. CSO 014 contributing area is approximately 0.6 acres.

CSO 014 is the last CSO on Interceptor 1 and does not receive flow from other CSOs. Based on modeling completed in HydroCAD 10.00-22, CSO 014 overflows as shown in Table 3-18.

TABLE 3-18
CSO 014 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	317	313	4	6	8
5-Year	2.96	593	408	185	18	1,485
10-Year	3.46	679	431	248	24	2,474
25-Year	4.15	767	452	315	36	4,113
50-Year	4.67	845	469	375	45	5,523
100-Year	5.22	928	486	441	51	7,097

CSO 016

CSO 016 is located on Concord Avenue adjacent to the Fred Mold Park on Interceptor 2 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure has an 8" VC inlet and outlet with an 8" VC overflow pipe approximately 1-inch above the outlet. A 14-inch high brick berm has been constructed to reduce the frequency of discharges. This structure is only 3.5-feet deep and has been reported to surge flow out of the cover. The structure is shown in Image 3-13.

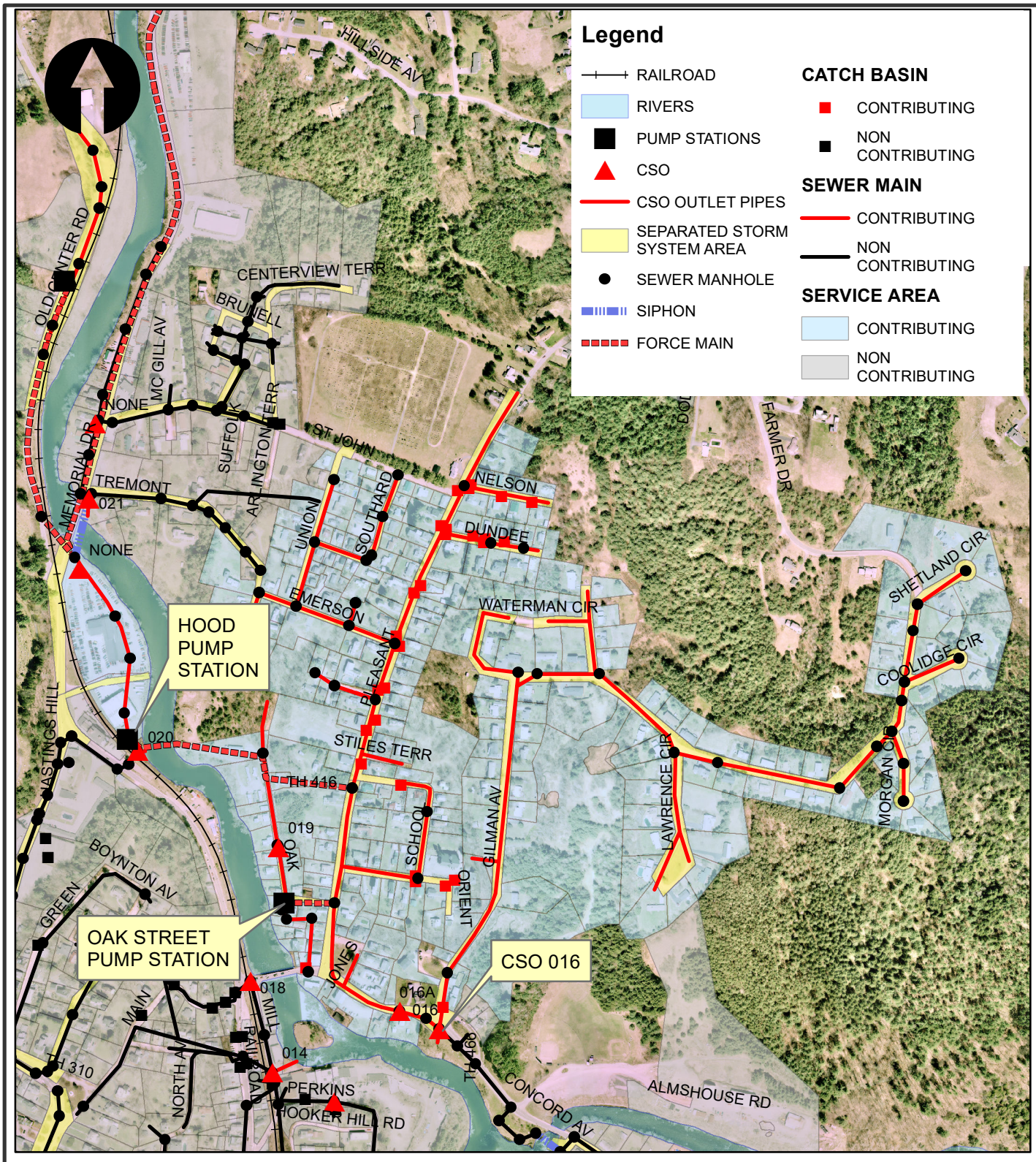
Image 3-13 - CSO 016

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had 27 reported overflows.

The primary combined sewer area contributing to CSO 016 is shown in Figure 3-11. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 9. For this evaluation, we used a peaking factor of 3.95 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 261
- Average Daily Flow: 65,680 GPD
- Maximum Daily Flow: 259,600 GPD
- Instantaneous Peak Flow: 180 GPM
- Hood Pump Station: 650 GPM
- Oak Street Pump Station: 275 GPM

The contributing main for this CSO is part of a large infrastructure improvement project planned for construction 2020-2022. The combined sewer collection mains contributing to CSO 016 are typically older with a majority (68.7%) of the contributing mains constructed of vitrified clay (VC) pipe, as shown in Table 3-19.



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-11

CSO 016
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 016.MXD

TABLE 3-19
CSO 016 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6	530	6,125				**6,655**	**34.6**
8	5,145	3,495				**8,640**	**44.9**
10		915				**915**	**4.8**
12	285	2680				**2,968**	**15.4**
18	65					**65**	**0.3**
Total Linear Feet	**6,025**	**13,215**				**19,240**	
% of Total	**31.3**	**68.7**					

There are 28 catch basins and no roof drains are believed to be connected to the combined sewer in the contributing area, which will be redirected to a designated storm collection system as part of the upcoming infrastructure project.

CSO 016 is on Interceptor 2 and both Oak Street Pump Station and Hood Pump Station are in the contributing area. The Hood Pump Station receives flow from CSO 020, CSO 021, Old Center Road Pump Station and St. Jay Center Pump Station. Based on modeling completed in HydroCAD 10.00-22, CSO 014 overflows as shown in Table 3-20.

TABLE 3-20
CSO 016 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	2,311	1,603	709	33	11,830
5-Year	2.96	2,310	1,602	708	201	100,477
10-Year	3.46	2,355	1,614	741	303	170,030
25-Year	4.15	2,327	1,607	720	495	287,100
50-Year	4.67	2,384	1,622	762	636	381,326
100-Year	5.22	2,353	1,614	739	744	490,281

CSO 020

CSO 020 is located east of the Hood Pump Station on Interceptor 2 and discharges to a headwall adjacent to the Passumpsic River. The precast concrete structure was reconstructed in August of 2015 and has a 12" PVC drop inlet, 18" VC inlet and outlet with a 15" PVC overflow pipe approximately 6.88-feet above the outlet, as shown in Image 3-14.

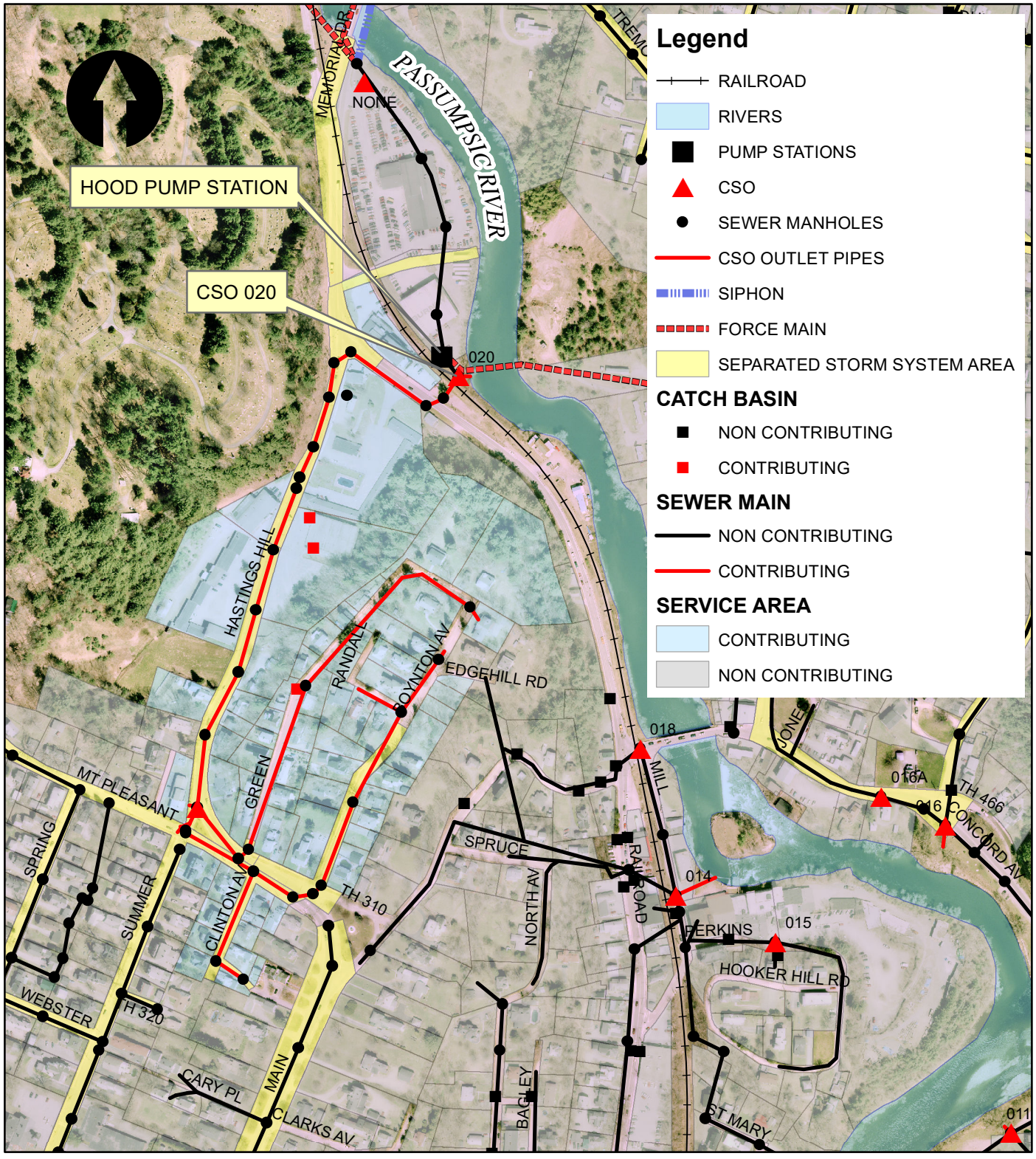
Image 3-14 - CSO 020

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had no reported overflows.

The primary combined sewer area contributing to CSO 020 is shown in Figure 3-12. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 10. For this evaluation, we used a peaking factor of 4.15 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 64
- Average Daily Flow: 21,440 GPD
- Maximum Daily Flow: 89,000 GPD
- Instantaneous Peak Flow: 62 GPM

The contributing main for this CSO was part of two large infrastructure improvement projects that were constructed in 2010 and 2015. The combined sewer collection mains contributing to CSO 020 are typically newer with a majority (70.5%) of the contributing mains constructed of polyvinyl chloride (PVC) pipe, as shown in Table 3-21.



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-12

CSO 020
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 020.MXD

TABLE 3-21
CSO 020 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
4	30					**30**	**0.6**
6	365	1,410				**1,775**	**33.6**
8	1,380	150				**1,530**	**28.9**
10	1,130					**1,130**	**21.3**
12	825					**825**	**15.6**
Total Linear Feet	**3,730**	**1,560**				**5,290**	
% of Total	**70.5**	**29.5**					

There are three catch basins and no roof drains believed to be connected to the combined sewer in the contributing area. However, the roof gutter down spout for 212 Hastings Hill discharges near a catch basin connected to the combined sewer. CSO 020 contributing area is approximately 2.1 acres.

CSO 020 is not on Interceptor 2, so it does not receive flow from any other CSO. Based on modeling completed in HydroCAD 10.00-22, CSO 020 does not overflow as shown in Table 3-22.

TABLE 3-22
CSO 020 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	691	691	0	0	0
5-Year	2.96	920	920	0	0	0
10-Year	3.46	997	997	0	0	0
25-Year	4.15	1,101	1,101	0	0	0
50-Year	4.67	1,179	1,179	0	0	0
100-Year	5.22	1,262	1,262	0	0	0

CSO 021

CSO 021 is located at the intersection of Memorial Drive and Tremont Street on Interceptor 2 and discharges to the Passumpsic River. The precast concrete structure has a 10" AC inlet, 8" AC inlet and a dual 6" cast iron siphon outlet with an 8" PVC overflow pipe approximately 17-inches above the outlet. The structure is 13.2-feet deep, as shown in Image 3-15.

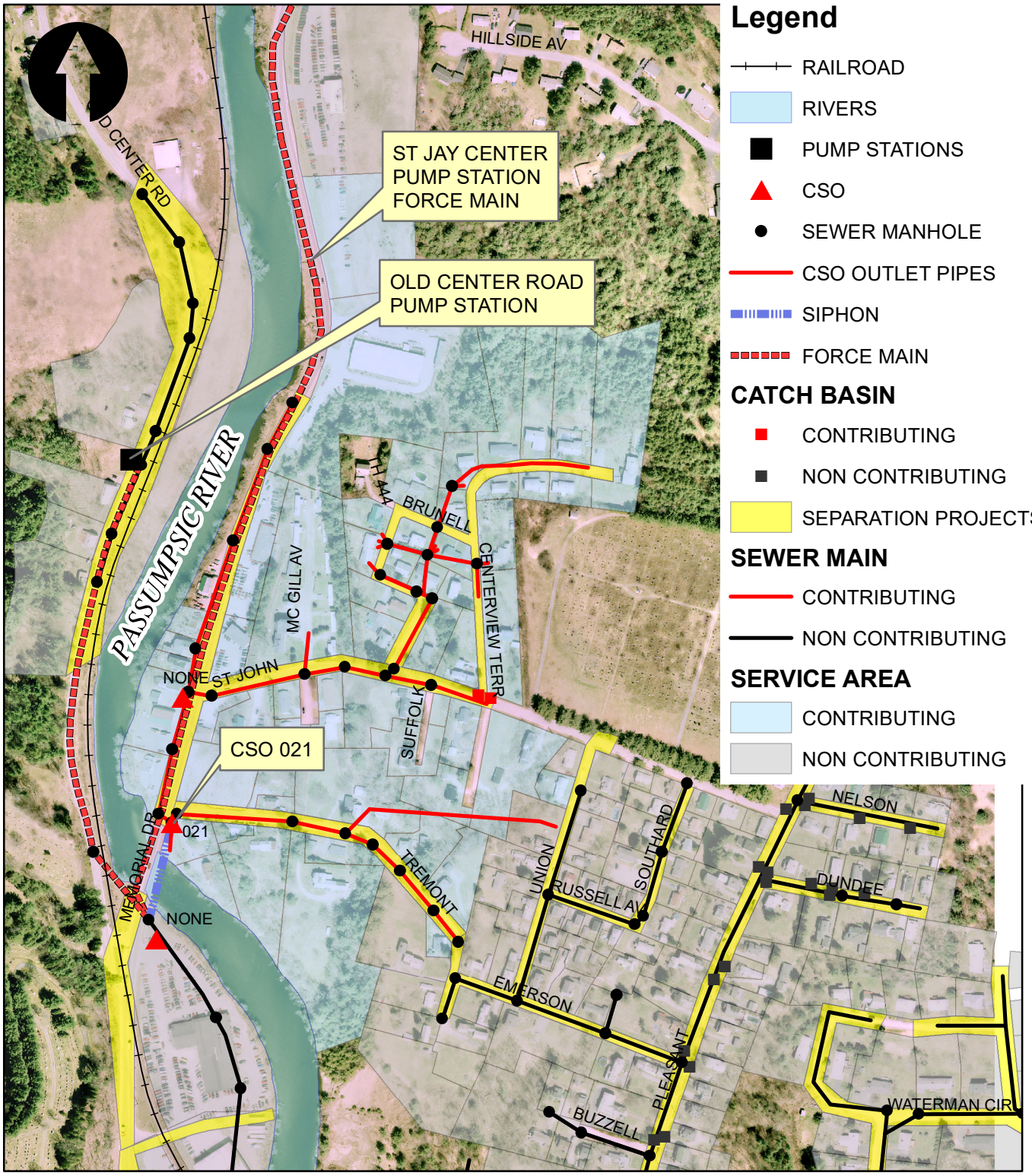
Image 3-15 - CSO 021

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had five reported overflows.

The primary combined sewer area contributing to CSO 021 is shown in Figure 3-13. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 11. For this evaluation, we used a peaking factor of 4.18 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 59
- Average Daily Flow: 14,360 GPD
- Maximum Daily Flow: 60,000 GPD
- Instantaneous Peak Flow: 42 GPM

The contributing main for this CSO has most of the stormwater collection removed from the combined sewer collection mains. A majority of the combined sewer collection mains contributing to CSO 021 are (56.3%) constructed of asbestos cement (AC) pipe installed in 1970 as part of the Hospital Area Sewerage and Water Systems improvement project, as shown in Table 3-23.



Legend

- RAILROAD
- RIVERS
- PUMP STATIONS
- CSO
- SEWER MANHOLE
- CSO OUTLET PIPES
- SIPHON
- FORCE MAIN

CATCH BASIN

- CONTRIBUTING
- NON CONTRIBUTING
- SEPARATION PROJECTS

SEWER MAIN

- CONTRIBUTING
- NON CONTRIBUTING

SERVICE AREA

- CONTRIBUTING
- NON CONTRIBUTING

0 125 250 500 750 1,000

Feet

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481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
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FIGURE NO. 3-13

CSO 021
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO.	3190007
PROJECT MJR.	AJD
SCALE	AS SHOWN
DATE	DECEMBER 18, 2020
DRAWING NO.	CSO 021.MXD

TABLE 3-23
CSO 021 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
6		140				**140**	**2.6**
8	1,560		1,750			**3,310**	**62.2**
10			1,250			**1,250**	**23.3**
18		635				**635**	**11.9**
Total Linear Feet	**1,560**	**775**	**3,000**			**5,325**	
% of Total	**29.3**	**14.4**	**56.3**				

There are two catch basins and no roof drains believed to be connected to the combined sewer in the contributing area. CSO 021 contributing area is approximately 1.25 acres. Because CSO 021 is the last CSO on Interceptor 2, it does not receive flow from any other CSO. Based on modeling completed in HydroCAD 10.00-22, CSO 021 does not overflow as shown in Table 3-24.

TABLE 3-24
CSO 021 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	502	502	0	0	0
5-Year	2.96	503	503	0	0	0
10-Year	3.46	502	502	0	0	0
25-Year	4.15	502	502	0	0	0
50-Year	4.67	492	492	0	0	0
100-Year	5.22	492	492	0	0	0

CSO 023

CSO 023 is located on the southern point of 401 Western Avenue on Interceptor 3 and discharges to the Sleepers River. The precast concrete structure has a 12” AC inlet and outlet and was not constructed to be an overflow structure. Based on our November 13, 2013 inspection, it was identified that the structure rim had been modified to allow sewage surcharging in the structure to discharge to the Sleepers River and a defined flow channel from the structure to the river did exist, as shown in Image 3-16.

Monitoring is done using a telltale devise placed on top of the concrete structure. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had four reported overflows.

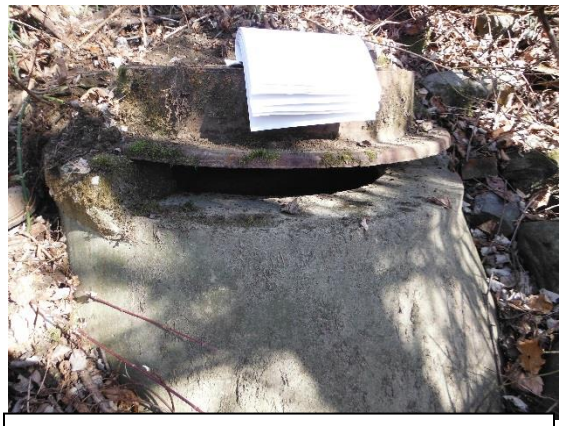

Image 3-16 - CSO 023

The primary combined sewer area contributing to CSO 023 is shown in Figure 3-14. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 12. For this evaluation, we used a peaking factor of 4.17 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 23
- Average Daily Flow: 16,500 GPD
- Maximum Daily Flow: 68,800 GPD
- Instantaneous Peak Flow: 48 GPM

The contributing main for this CSO has had all known stormwater collection removed from the combined sewer collection mains. The combined sewer collection mains contributing to CSO 023 are all constructed of asbestos cement (AC) pipe, as shown in Table 3-26.

TABLE 3-25
CSO 023 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
8			1,990			**1,990**	**75.4**
12			650			**650**	**24.6**
Total Linear Feet			**2,640**			**2,640**	
% of Total			**100**				

There are no catch basins or roof drains believed to be connected to the combined sewer in the contributing area. The flow entering this structure is constricted based on the size of main entering the CSO.

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481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-14

CSO 023
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 023.MXD

CSO 023 is the second CSO on Interceptor 3 and receives flow from CSO 027. Based on modeling completed in HydroCAD 10.00-22, CSO 023 does not overflow as shown in Table 3-26.

TABLE 3-26
CSO 023 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	661	661	0	0	0
5-Year	2.96	663	663	0	0	0
10-Year	3.46	654	654	0	0	0
25-Year	4.15	653	653	0	0	0
50-Year	4.67	654	654	0	0	0
100-Year	5.22	661	661	0	0	0

CSO 024

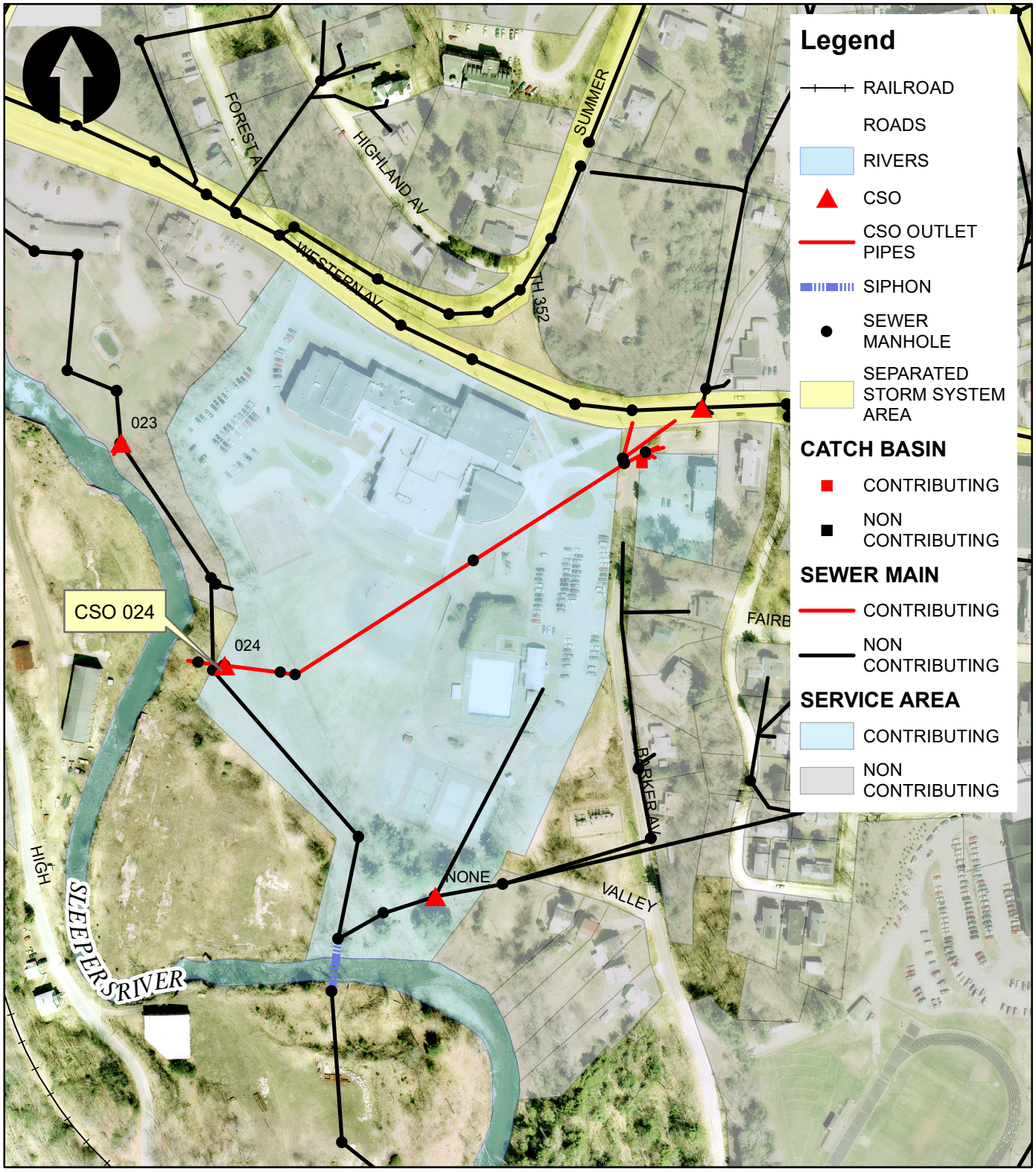
CSO 024 is located on the west side of the St. Johnsbury School property and discharges into Interceptor 3 and overflows to the Sleepers River. The precast concrete structure has a 24" AC inlet and 8" AC outlet with a 24" AC overflow pipe approximately 5.5-feet above the outlet, as shown in Image 3-17.

Image 3-17 - CSO 024

Monitoring is done using a telltale device placed in the overflow pipe. Based on Wastewater Untreated Discharge Incident Reports submitted by the Town between February of 2019 and August of 2020 this structure had nine reported overflows.

The primary combined sewer area contributing to CSO 024 is shown in Figure 3-15. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 13. For this evaluation, we used a peaking factor of 4.14 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 2
- Average Daily Flow: 22,255 GPD
- Maximum Daily Flow: 92,260 GPD
- Instantaneous Peak Flow: 64 GPM



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-15

CSO 024
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 024.MXD

The contributing main for this CSO has most of the stormwater collection removed from the combined sewer collection mains. A majority (97.1%) of the combined sewer collection mains contributing to CSO 024 are constructed of asbestos cement (AC) pipe installed in 1963 as part of the Interceptor Main project, as shown in Table 3-27.

TABLE 3-27
CSO 024 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
4	35					**35**	**2.9**
12			340			**340**	**28.5**
24			820			**820**	**68.6**
Total Linear Feet	**35**		**1,160**			**1,195**	
% of Total	**2.9**		**97.1**				

There is one catch basin and no roof drains believed to be connected to the combined sewer in the contributing area and no known rooftop drains. CSO 024 contributing area is approximately 0.9 acres.

Because CSO 024 is not on an Interceptor, it does not receive flow from any other CSO. Based on modeling completed in HydroCAD 10.00-22, CSO 024 overflows as shown in Table 3-28.

TABLE 3-28
CSO 024 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	447	447	0	0	0
5-Year	2.96	980	980	0	0	0
10-Year	3.46	1,282	1,282	0	0	0
25-Year	4.15	1,719	1,712	7	1	7
50-Year	4.67	2,060	1,757	302	6	893
100-Year	5.22	2,425	1,783	642	9	2,715

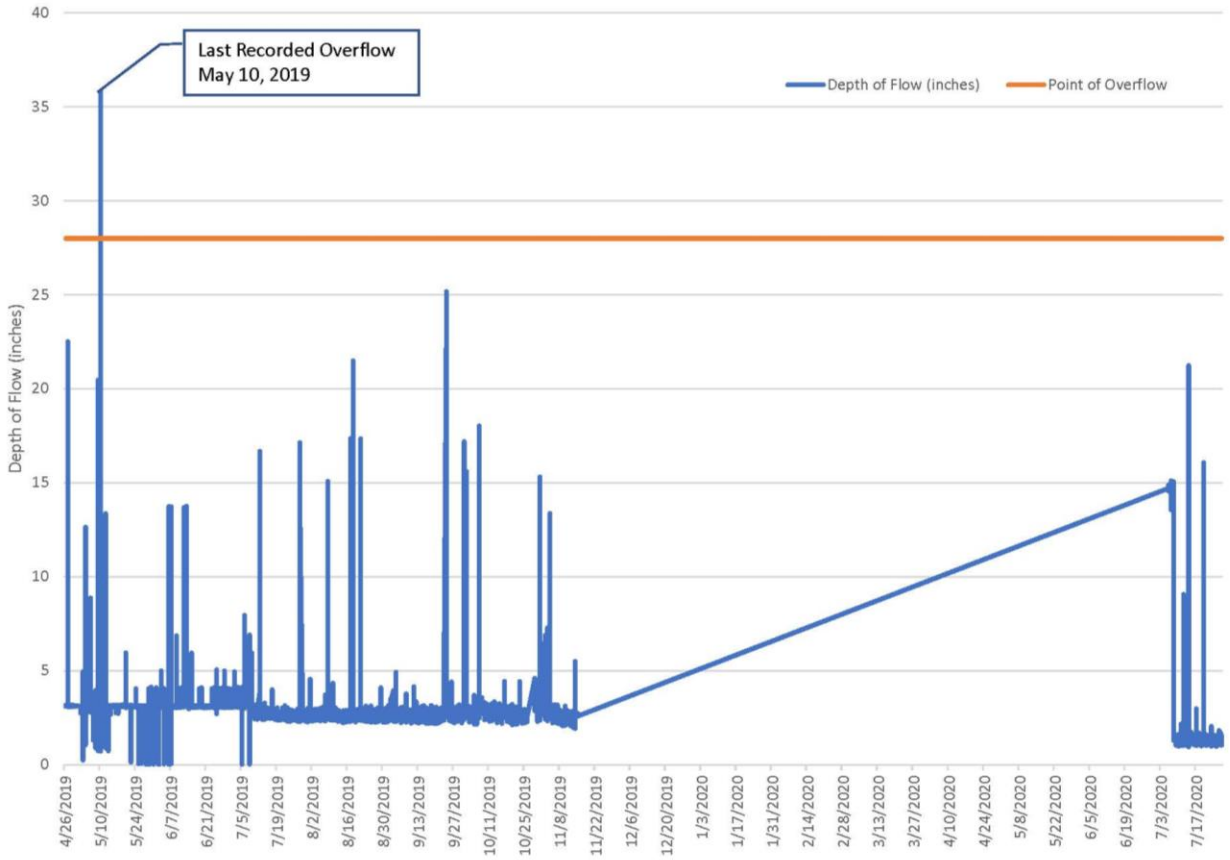
CSO 027

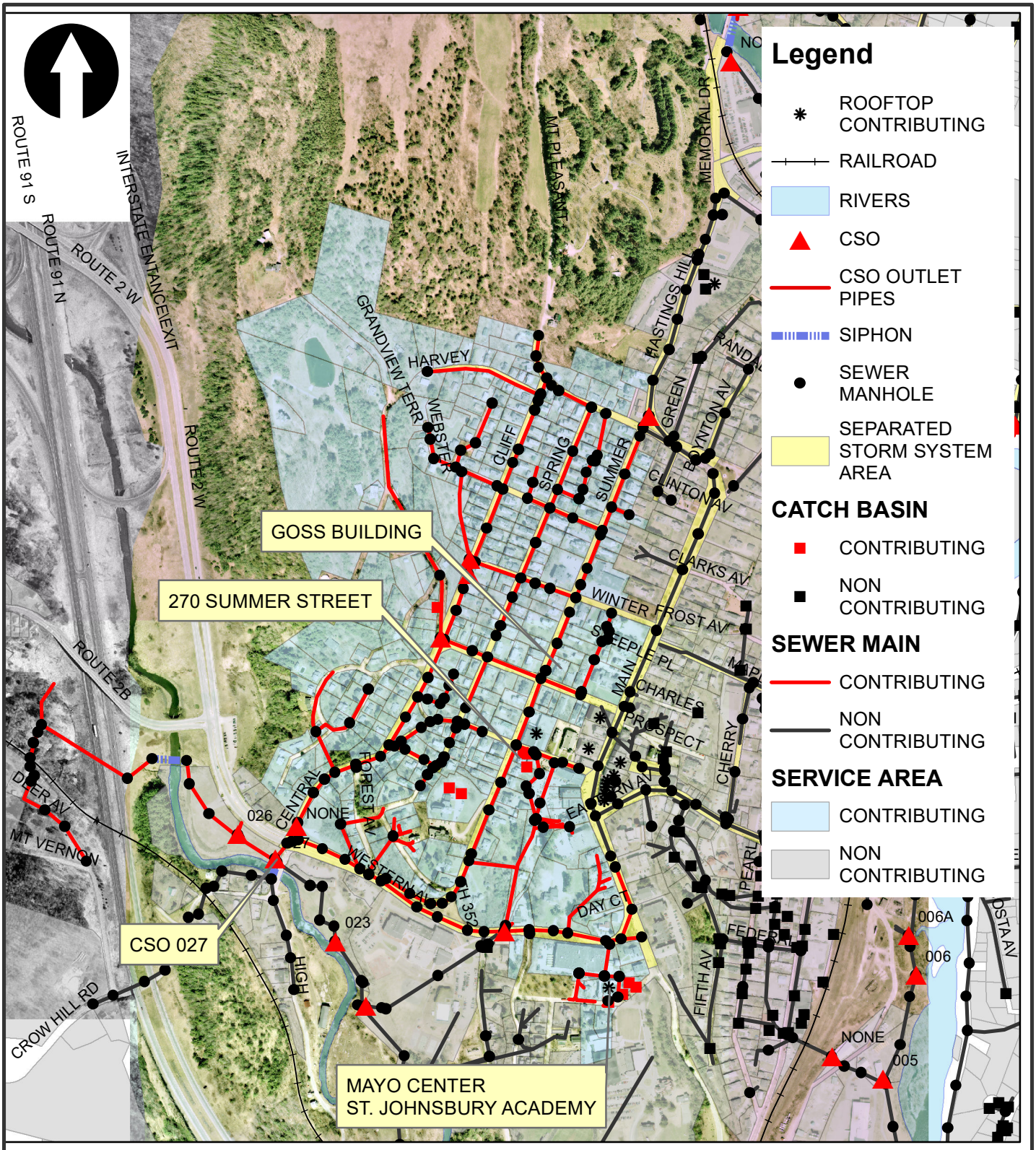
CSO 027 is located on the southwest side of 85 US Route 2W and discharges into Interceptor 3 and overflows to the Sleepers River. The precast concrete structure has a 24" VC inlet and outlet with an 8" VC overflow pipe approximately 28-inches above the outlet, as shown on Image 3-18.

Image 3-18 - CSO 027

It is an active combined sewer overflow with a BlueSiren flow monitoring device installed. The BlueSiren records the depth of flow in the overflow every 30 minutes. When a high alarm has been triggered, the BlueSiren device increases readings to every five minutes. The last recorded overflow on the BlueSiren recorder was May 10, 2019, as shown in Image 3-19.

IMAGE 3-19
CSO 027 BLUESIREN DATA





DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 3-16

CSO 027
CONTRIBUTING AREA

SAINT JOHNSBURY, VERMONT

PROJECT NO.	3190007
PROJECT MJR.	AJD
SCALE	AS SHOWN
DATE	DECEMBER 18, 2020
DRAWING NO.	CSO 027.MXD

The Town reported an overflow on May 29, 2020; however it was not recorded in the BlueSiren data because the battery needed to be replaced and the unit was off line.

The primary combined sewer area contributing to CSO 027 is shown in Figure 3-16. The estimated combined sewer contributing to this overflow has been calculated using flows listed in the Vermont EPR Wastewater System and Potable Water Supply Rules (VWWSR), permitted flows or recorded water meter data, for more information regarding individual properties refer to Appendix A Table 14. For this evaluation, we used a peaking factor of 3.8 as listed in Table 10-1 VWWSR. Estimated combined sewer contributing flows are as follows:

- Total Contributing Properties: 361
- Average Daily Flow: 137,410 GPD
- Maximum Daily Flow: 522,140 GPD
- Instantaneous Peak Flow: 365 GPM

The contributing main for this CSO has most of the stormwater collection removed from the combined sewer collection mains. A majority (73.7%) of the combined sewer collection mains contributing to CSO 027 are constructed of polyvinyl chloride (PVC) pipe installed as part of multiple utility replacement projects, as shown in Table 3-29.

TABLE 3-29
CSO 027 COMBINED SEWER COLLECTION MAINS

Diameter (in)	Pipe Length (ft) by Material					Total Linear Feet	% of Total
	PVC	VC	AC	RCP	BRICK		
4	940					**940**	**3.2**
6	1,420	4,200				**5,620**	**18.9**
8	15,900	930	2,510			**19,340**	**65.2**
10	3,010					**3,010**	**10.1**
12	420					**420**	**1.4**
15	160					**160**	**0.5**
24	20	175				**195**	**0.7**
Total Linear Feet	**21,870**	**5,305**	**2,510**			**29,685**	
% of Total	**73.7**	**17.9**	**8.4**				

There are seven catch basins believed to be connected to the combined sewer in the contributing area. There are also several buildings whose roof drains are known to be connected to the combined sewer system. The two largest buildings that have roof drains connected to the storm system are the Goss Building and the Mayo Center at the St. Johnsbury Academy. The Mayo Center does have a stormwater treatment system

on site using two 6,000-gallon open bottom dry wells, however the overflow discharges to the sewer system.

CSO 027 is the last CSO on Interceptor 3 and does not receive flow from any other CSO. Based on modeling completed in HydroCAD 10.00-22, CSO 023 overflows as shown in Table 3-30.

TABLE 3-30
CSO 027 COMBINED SEWER ESTIMATED FLOW

Storm Event	Precipitation Rate (inches)	Peak Inflow (gpm)	Peak Sanitary Outflow (gpm)	Peak Overflow Outflow (gpm)	Estimated Overflow Impact	
					Duration (Minutes)	Total Gallons
1-Year	1.98	1,312	1,010	302	13	2,295
5-Year	2.96	1,729	1,080	649	22	8,123
10-Year	3.46	1,782	1,092	689	27	11,439
25-Year	4.15	1,868	1,115	752	33	16,441
50-Year	4.67	1,920	1,130	791	38	20,491
100-Year	5.22	1,980	1,147	833	44	24,966

SECTION 4
EVALUATION OF ALTERNATIVES
PRELIMINARY ENGINEERING REPORT
COMBINED SEWER LONG TERM CONTROL PLAN
ST. JOHNSBURY, VERMONT
December 18, 2020

General

The existing combined sewer collection system has a variety of issues related to aging, small diameter sewer mains, and stormwater collection. These issues include the inability to reliably maintain the collection system. Due to the St. Johnsbury 1272 order from the Vermont Agency of Natural Resources a Long-Term Control Plan (LTCP) to evaluate alternatives to avoid violations of the Vermont Water Quality Standards (VT WQS) is required. This section evaluates alternatives for the combined sewer collection system and its outfalls to avoid violations of the VT WQS. The CSO's evaluated in this section are those identified as either active or inactive. There are additional CSO's that have been identified as abandoned which are not evaluated here.

Combined Sewer System Alternatives

The following is a list of alternatives to manage the combined sewer system to avoid violations of the VT WQS:

1. Installing a flow metering system for each CSO outfall;
2. Routine maintenance of trunkline and contributing mains;
3. Reducing stormwater flows through the separation of combined stormwater and sanitary sewer lines;
4. Increasing collection system storage capacity;
5. Expanding the treatment plant capacity;
6. Adding screening and disinfection facilities for the overflow;
7. Incorporating green stormwater infrastructure to reduce stormwater flow into the combined sewer system to the greatest extent feasible and practical; and
8. Provide treatment of CSOs discharge at the outfall.

Each of these alternatives is discussed below.

Flow Metering System

Monitoring overflow events is an important way for municipalities to identify areas of concern in combined sewer collection systems. The Town of St. Johnsbury currently has electronic flow metering devices installed in CSO 006, 011, and 027. All other CSO's are manually monitored by PWD employees using a tell-tale block after every precipitation/runoff event.

Available Alternatives:

There are a number of alternatives available for monitoring the flow that provide a variety of benefits. Table 4-1 below summarizes two of the most commonly used methods:

TABLE 4-1
FLOW METERING SYSTEMS

Device	Pros	Cons	Estimated Purchase Price	Estimated Annual Cost
Tell-tale Block	• No technician needed for installation	• Visual inspection required to verify event • Length of overflow unknown	$20	$0
Flow Depth Monitoring System	• No visual inspection required • Length of overflow recorded • Alarms and notifications provided • No electrical service required • Collection of continuous event data	• Batteries require replacement • Annual maintenance fee for data access • Professional installation required	$8,500.00	$400.00

Funding Options:

CWSRF currently has a 100% subsidy program to assist Towns with improving monitoring programs and installing metering devices. It is recommended that metering devices be installed in all CSOs with the following structures being the highest priority:

1. CSO 009
2. CSO 021
3. CSO 007
4. CSO 010

Maintenance Program

Dedicated maintenance of the combined sewer system is an important and cost-effective tool for reducing the number of CSO events. Combined sewer systems require a higher level of maintenance due to grit and debris being collected in the stormwater.

The following changes should be incorporated into an official cleaning protocol:

- Use fin attachment nozzles on the hose to direct flow to the bottom of the pipe when cleaning.
- Clean mains with high entering flow and flat sloped outlets that allow for the settlement of solids and excessive buildup, twice per year.
- Clean manhole to manhole where possible in 100-foot increments. Limiting workers to 100-foot increments will help ensure that grit and debris in each section will be thoroughly removed.
- Coordinate pump station shutdowns when excess flow does not allow for adequate cleaning. Cleaning should also take place during dry weather flows. If a pipe is more than 50% full, flow in the pipe will force sediment to stay in the bottom of the pipe instead of becoming turbulent which allows for removal during cleaning process.
- Identify current and historic locations for sediment accumulation to identify areas of investigation for inflow conditions.

All sections of the interceptors should be cleaned regularly, however some areas require more frequent cleaning because they experience heavy buildup of grit and debris. The recommended cleaning schedule is shown in Figure 4-1. If more frequent cleaning is found to be necessary, this schedule should be amended. It is recommended that Interceptor mains be CCTV inspected every five years to verify the effectiveness of the maintenance practices and the integrity of the main. A summary of the necessary cleaning is outlined below.

Interceptor 1

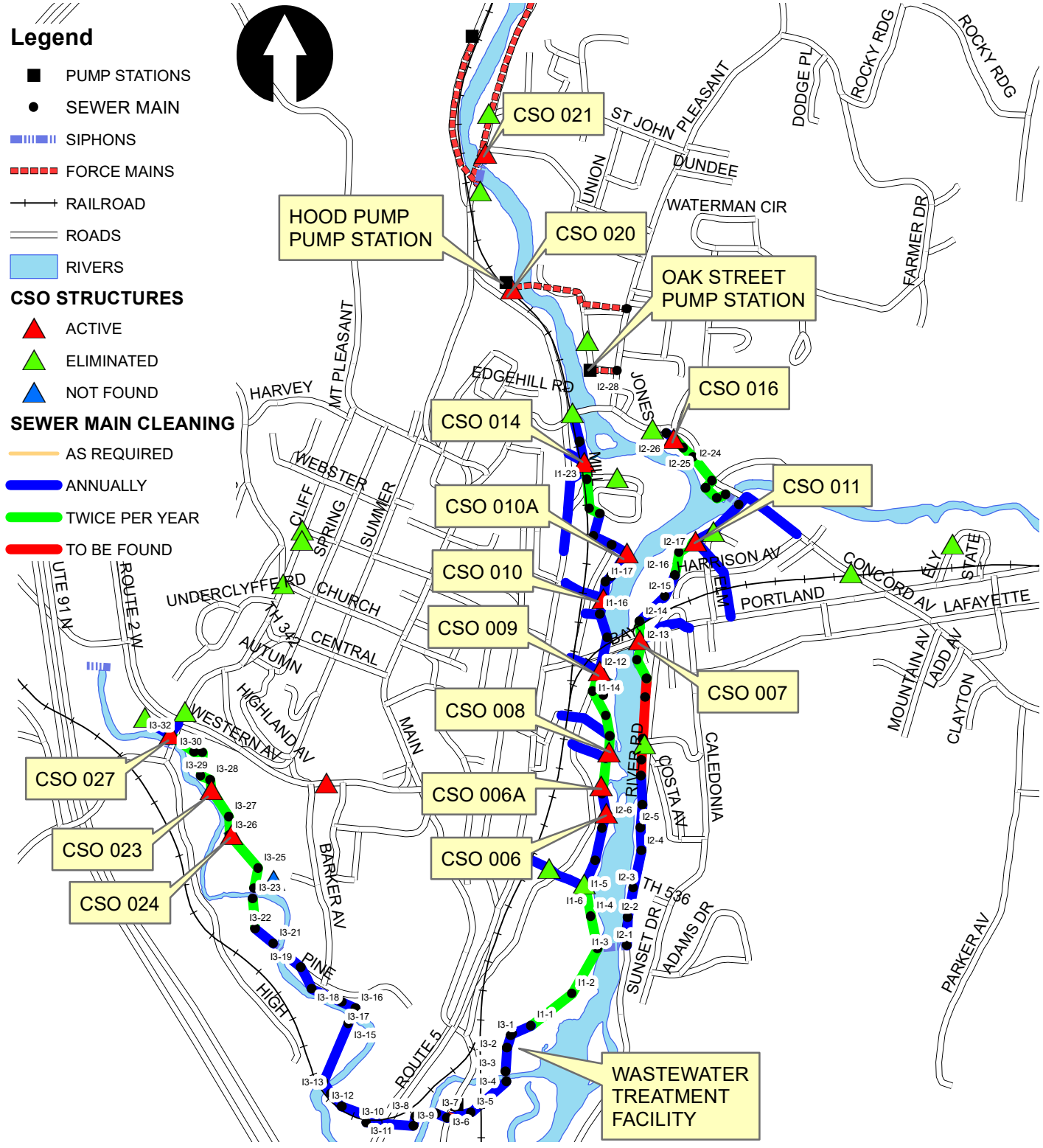
I1-1 to I1-5: The 14-inch asbestos cement (AC) pipe between manholes I1-1 and I1-5 should be cleaned twice per year. This area has a high amount of contributing storm water and is highly likely to see grit and debris collection.

I1-5 to I1-9: The 14-inch AC pipe between manholes I1-5 and I1-9 should be cleaned annually. This area has a lesser amount of contributing storm water and is therefore less likely to see grit and debris collection.

I1-9 to CSO 009: The 12-inch AC pipe between manholes I1-9 and CSO 009 should be cleaned twice per year. This area has a high amount of contributing storm water and is highly likely to see grit and debris collection.

CSO 009 to I1-21: The 10-inch AC pipe between manholes CSO 009 and I1-21 should be cleaned annually. This area has a lesser amount of contributing storm water and is therefore less likely to see grit and debris collection.

I1-21 to CSO 014: The 10-inch AC pipe between manholes I1-21 and CSO 014 should be cleaned twice per year. This area has a high amount of contributing storm water and is highly likely to see grit and debris collection.



DUFRESNE GROUP
CONSULTING ENGINEERS

459 Portland Street, Suite 106
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605 Fax: (802) 748-4512
E-mail: dufresne@vermontel.net
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-1

MINIMUM RECOMMENDED INTERCEPTOR CLEANING SCHEDULE

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO OVERVIEW

Interceptor 2

I2-1 to I2-7: The 20-inch AC pipe between manholes I2-1 and I2-7 should be cleaned annually. This area has a lesser amount of contributing storm water and is less likely to see grit and debris collection. In January of 2020, Dufresne Group worked with H. A. Manosh to review the condition of this section of the trunk line. This section required light cleaning prior to camera inspection.

I2-7 to I2-11: The 20-inch AC pipe between manholes I2-7 and I2-11 has not been cleaned or evaluated. The exact location of these manholes is unknown and discussion with Town public works employees indicated that the manholes have not been accessed in a number of years. It is recommended that the Town work to locate these structures to allow for cleaning.

I2-11 to I2-14: The 20-inch AC pipe between manholes I2-11 and I2-14 should be cleaned twice per year. This area is highly susceptible to grit and debris collection from stormwater entering through CSO-007. In January of 2020, Dufresne Group worked with H. A. Manosh to review the condition of this section of the trunk line. This section required extremely heavy cleaning prior to camera inspection. Based on camera inspection of this main, this section appears to be structurally sound.

I2-14 to I2-16: The 20-inch AC pipe between manholes I2-14 and I2-16 have not been cleaned or evaluated. The accessibility and locating these manhole were a factor. Manhole I2-14 was found but equipment could not access the manhole. Discussion with Town public works employees in regards to manholes I2-15 and I2-16 indicated that the manholes have not been accessed in a number of years. A plan for accessing these structures should be developed to allow for maintenance.

I2-16 to CSO-011: The 20-inch AC pipe between manholes I2-16 and CSO-011 should be cleaned twice per year. I2-16 was located in the cameraing of the line but could not be located from the surface. This area is highly susceptible to grit and debris collection from stormwater because an 18-inch clay tile (VC) main that services the Portland Street area meets the trunkline at CSO-011 and discharges into the 20-inch AC main with a slope of 0.0010. Based on camera inspection of this main, this section appears to be structurally sound.

In December of 2019, Dufresne Group worked with H. A. Manosh to review the condition of this section of the trunk line. This section required extremely heavy cleaning prior to camera inspection. It was estimated that H. A. Manosh removed approximately 6 cubic yards of debris from the 200-feet of main directly down stream of CSO-011. CSO-011 has a BlueSiren flow monitor installed, which indicated that the cleaning of this section of trunkline resulted in the following changes:

TABLE 4-2
CSO 011 CLEANING IMPROVEMENTS

	May 1, 2019 to December 12, 2019 (Cleaning)	December 13, 2019 to June 12, 2020 (Cleaning)
Average Flow Depth	10.1-inches	4.2-inches
Maximum Flow Depth	55.5-inches	32.4-inches
Number of Overflows	26	3

I2-20 to I2-23: The 18-inch asbestos cement (AC) pipe between manholes I2-20 and I2-23 should be cleaned twice per year. This area is highly susceptible to grit and debris collection due to I2-20 discharging to a single siphon. The 18-inch AC main is capable of passing approximately 2,700 gallons per minute (gpm) while the 8-inch siphon can only pass approximately 670 gpm. This significant reduction in flow capacity allows for grit and other material to settle within this section of main.

In April of 2018, Dufresne Group worked with Hartigan Wastewater Services to review the condition of this section of the trunk line. As shown in photos below, there was a significant amount of grit being stored in this section of trunk line.

Image 4-1 – Trunkline Prior to Cleaning

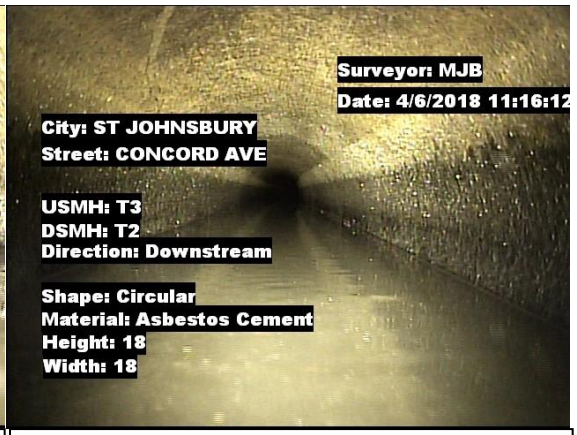


Image 4-2 – Trunkline After Cleaning

Interceptor 3

Structures along Interceptor 3 should be evaluated for access and condition. This Interceptor could not be accessed by H. A. Manosh for cleaning and camera inspection.

I3-1 to I3-22: The 14-inch AC pipe between manholes I3-1 and I3-22 should be cleaned annually. This area has low contributing stormwater and is less likely to see grit and debris collection.

I3-23 to I3-32: The 14-inch and 12-inch AC pipes between I3-23 and I3-32 should be cleaned twice per year. This area is highly susceptible to grit and debris collection from stormwater entering from Barker and Fairbanks Drive, but has also been found to have issues with roots. Town employees serviced this area recently in order to address high

flow levels in CSO 027 and found a large number of roots in the main between I3-27 and I3-29.

Stormwater Separation

Removing stormwater from the combined sewer system is a highly effective way to reduce the frequency and duration of overflow events. Discharging stormwater separately reduces the strain on the treatment facility by decreasing the fluctuation in flow and grit. Projects that will remove stormwater are outlined below.

Proposed Projects:

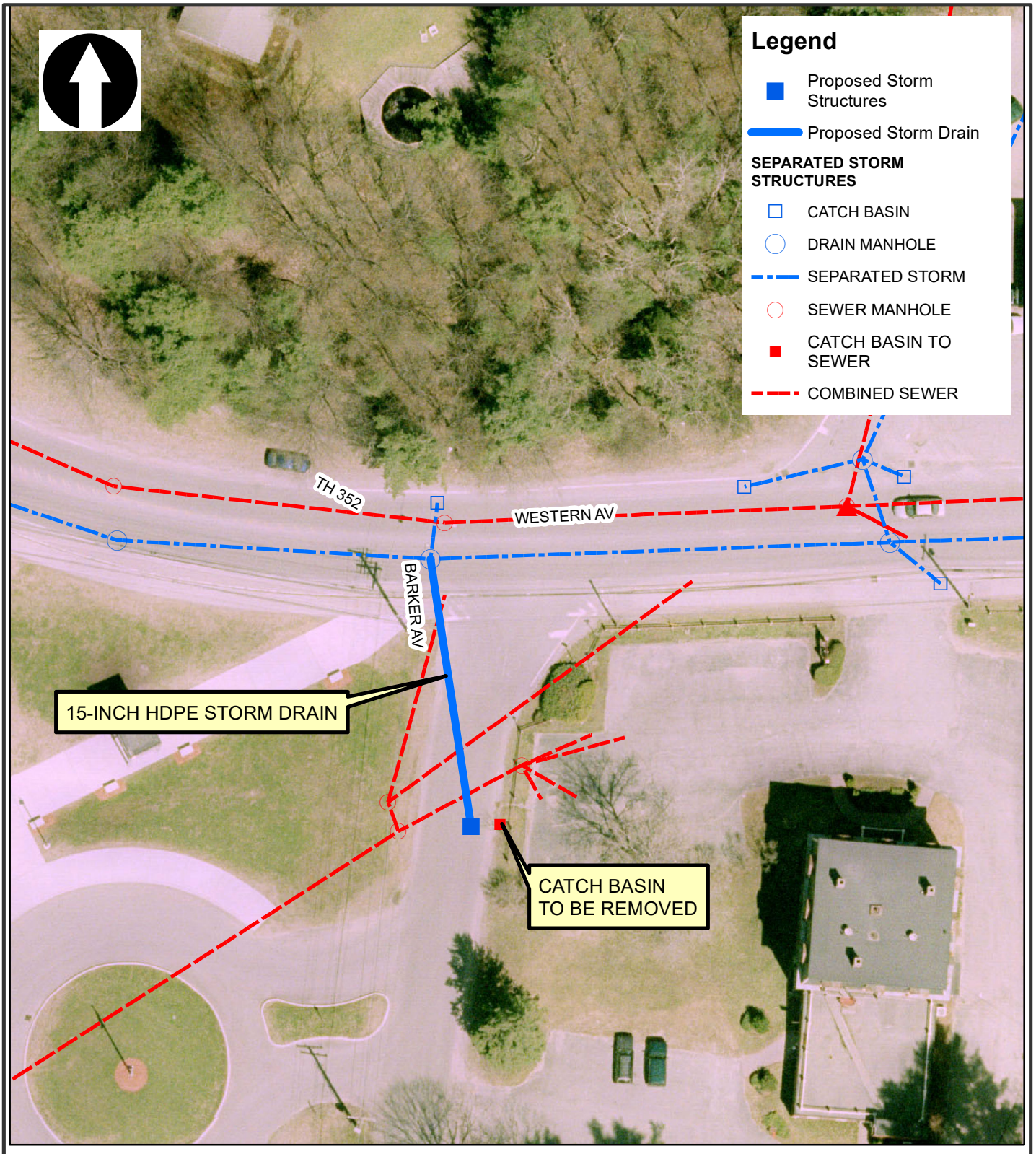
Barker Avenue Stormwater Improvements Project: A catch basin near the intersection of Western Avenue should be replaced and redirected to the separated storm system on Western Avenue, as shown in Figure 4-2. By removing this structure, it is believed that all stormwater contributing to CSO 024 will have been removed. The estimated cost to complete this project as shown in Figure 4-2 is $28,790, as outlined in Table 4-2.

TABLE 4-3
BARKER AVENUE STORMWATER IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Catch Basin	7	VF	$550.00	$3,850.00
2	15" HDPE Storm Drain	80	LF	$80.00	$6,400
3	Core Existing Structure	1	EA	$500.00	$500.00
4	Sidewalk Restoration	10	SY	$85.00	$850.00
5	Permanent Trench Pavement	80	SY	$50.00	$4,000.00
6	Misc. Work & Cleanup	1	LS	$4,400.00	$4,400.00
				Subtotal	**$20,000.00**
Contingency (10%)					$2,000.00
Engineering					$6,190.00
Legal, Fiscal, Admin (3%)					$600.00
				Total	**$28,790.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

Although CSO 024 does not overflow until a 25-year storm event, this would reduce the 24-hour runoff volume to the wastewater treatment facility during a 5-year storm event by approximately 25,875 gallons. The Town currently charges septic haulers $0.10/gallon to cover the cost of the treatment, which means that this storm event would be equivalent to $2,590 in lost capacity at the treatment plant.



0 25 50 100 150 200 Feet

DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-2

BARKER AVENUE
STORMWATER IMPROVEMENTS
PROJECT

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 024.MXD

Fairbanks Drive Stormwater Improvements Project: St Johnsbury Academy Mayo Center roof drains and yard basins are collected into two 600-gallon drywells that overflow to the combined sewer. Roof drains and private catch basins account for a majority of the stormwater contributing to CSO 027 since the Town has completed extensive separation in this drainage area. The estimated cost to complete this project as shown in Figure 4-3 is $209,030.00, as outlined in Table 4-4.

TABLE 4-4
FAIRBANKS DRIVE STORMWATER IMPROVEMENTS COST ESTIMATE

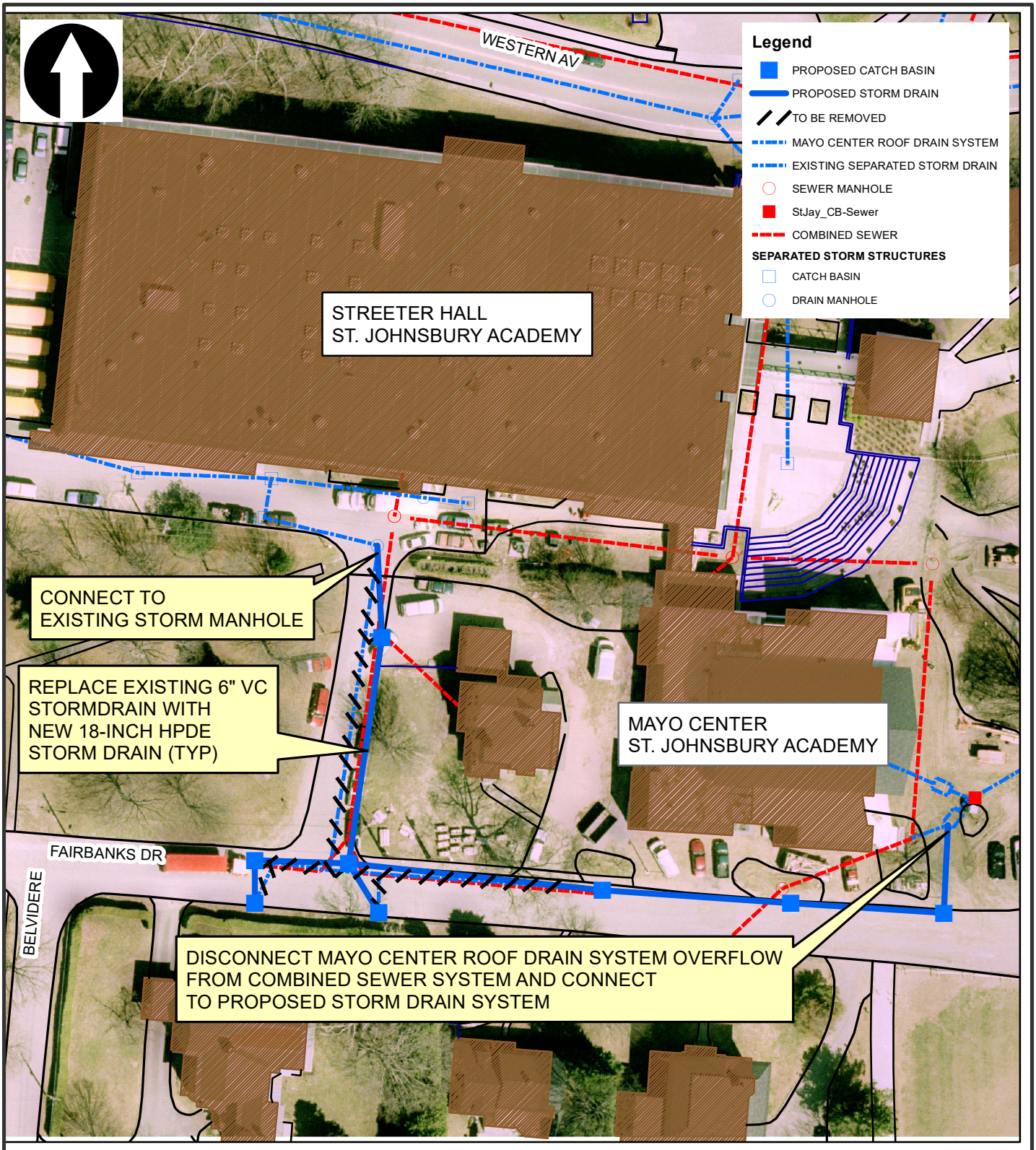
Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Catch Basin	60	VF	$550.00	$33,000.00
2	18" HDPE Storm Drain	550	LF	$80.00	$49,500.00
3	Core Existing Structure	1	EA	$500.00	$500.00
4	Sidewalk Restoration	150	SY	$85.00	$12,750.00
5	Base Course Pavement	130	TON	$105.00	$13,650.00
6	Top Course Pavement	80	TON	$105.00	$8,400.00
7	Misc. Work & Cleanup	1	LS	$32,200.00	$32,200.00
				Subtotal	**$150,000.00**
Contingency (10%)					$15,000.00
Engineering					$39,530.00
Legal, Fiscal, Admin (3%)					$4,500.00
				Total	**$209,030.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

Table 4-5 outlines the impact that removing this stormwater would have on CSO 027 and CSO 023:

TABLE 4-5
FAIRBANKS DRIVE STORMWATER IMPROVEMENTS
COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-in)	5-Year Storm (2.94-in)	10-Year Storm (3.44-in)	25-Year Storm (4.15-in)	50-Year Storm (4.67-in)	100-Yr Storm (5.22-in)
CSO Discharge Reduction (gal)	1,462.6	4,819.3	6,753.1	8,916.7	11,317.1	14,796.0
Cost of Reduction per Gallon	$143.00	$44.00	$31.00	$24.00	$19.00	$14.00
WWTF Flow Reduction (gal)	4,595.3	6,558.6	7,558.2	9,571.4	10,379.7	10,323.7
Estimated Cost to Treat Stormwater ($0.10/Gal)	$460.00	$656.00	$756.00	$957.00	$1,038	$1,034



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-3

FAIRBANKS DRIVE
STORMWATER IMPROVEMENTS
PROJECT

SAINT JOHNSBURY, VERMONT

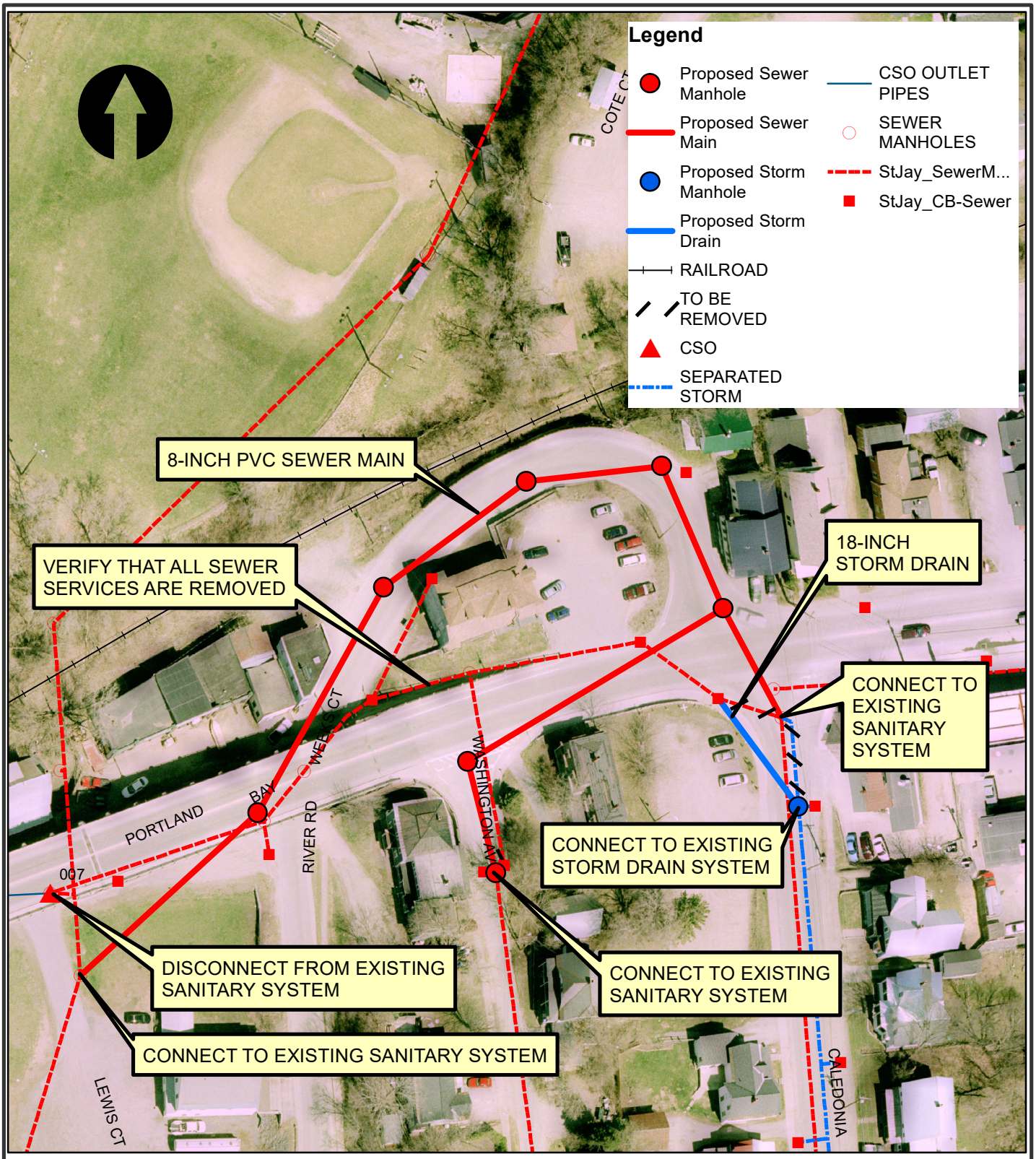
PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 027 pr.MXD

Caledonia/Washington Sewer Improvement Project: Separated storm from Caledonia Street and Washington Avenue is discharged into the combined sewer collection system that contributes to CSO 007. CSO 007 is not on Interceptor 2 but discharges to it. Installing new sewer main around Weeks Court will allow the existing system to be used as a designated storm. These mains are clay tile and have not been evaluated for condition. This project will also make use of the separation work the Town has already completed. The estimated cost to complete this project as shown in Figure 4-4 is $332,130.00, as outlined in Table 4-6.

TABLE 4-6
CALEDONIA/WASHINGTON SEWER IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	80	VF	$650.00	$52,000.00
2	8-inch PVC Sewer Main	910	LF	$80.00	$72,800.00
3	4-inch PVC Sewer Service	180	LF	$75.00	$13,500.00
4	8"x6" PVC Service Wye	6	EA	$200.00	$1,200.00
5	18" HDPE Storm Drain	100	LF	$90.00	$9,000.00
6	Core Existing Structure	2	EA	$500.00	$1,000.00
7	Sidewalk Restoration	15	SY	$85.00	$1,275.00
8	Permanent Trench Pavement	800	SY	$50.00	$40,000.00
9	Misc. Work & Cleanup	1	LS	$49,225.00	$49,225.00
				Subtotal	**$240,000.00**
Contingency (10%)					$24,000.00
Engineering					$60,930.00
Legal, Fiscal, Admin (3%)					$7,200.00
				Total	**$332,130.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-4

CALEDONIA/WASHINGTON SEWER IMPROVEMENTS PROJECT

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 007.MXD

Table 4-7 outlines the impact that removing this stormwater would have on CSO 007:

TABLE 4-7
CALEDONIA/WASHINGTON SEWER IMPROVEMENTS
COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	33,930	76,370	101,970	140,490	171,510	205,650
Cost of Reduction per Gallon	$9.80	$4.35	$3.25	$2.40	$1.95	$1.60
WWTF Flow Reduction (gallons)	84,900	132,660	156,180	187,710	210,770	234,745
Estimated Cost to Treat Stormwater ($0.10/Gal)	$8,490	$13,270	$15,620	$18,770	$21,080	$23,475

Railroad Street – Bagley to Maple Sewer and Storm Improvement Project:
Combined sewer from Railroad Street between Maple Street and Bagley Street is conveyed to Interceptor 1 in an 18-inch clay tile main that runs under multiple buildings to CSO 009. The owner of 136 Bay Street (St. Johnsbury Paper) has reported several backups from the Town combined system into the structure. It is also believed that some of the flow from Bagley Street maybe impacting CSO 010, as well. By installing new sewer and storm along this section of Railroad Street, the flows can be redirected to be conveyed through the separated system installed as part of the 1984 Central Business District Improvements project. The estimated cost to complete this project as shown in Figure 4-5 is $427,410.00, as outlined in Table 4-8.

TABLE 4-8
RAILROAD STREET – BAGLEY TO MAPLE
SEWER AND STORM IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	75	VF	$650.00	$48,750.00
2	4'Ø Catch Basin	24	VF	$550.00	$13,200.00
3	12-inch PVC Sewer Main	560	LF	$85.00	$47,600.00
4	4-inch PVC Sewer Service	450	LF	$75.00	$33,750.00
5	12"x6" PVC Service Wye	12	EA	$300.00	$3,600.00
6	18" HDPE Storm Drain	600	LF	$90.00	$54,000.00
7	Core Existing Structure	2	EA	$500.00	$1,000.00
8	Sidewalk Restoration	40	SY	$85.00	$3,400.00
9	Base Course Pavement	225	TON	$105.00	$23,625.00
10	Top Course Pavement	135	TON	$105.00	$14,175.00
11	Misc. Work & Cleanup	1	LS	$49,225.00	$66,900.00
				Subtotal	**$310,000.00**
Contingency (10%)					$31,000.00
Engineering					$77,110.00
Legal, Fiscal, Admin (3%)					$9,300.00
				Total	**$427,410.00**

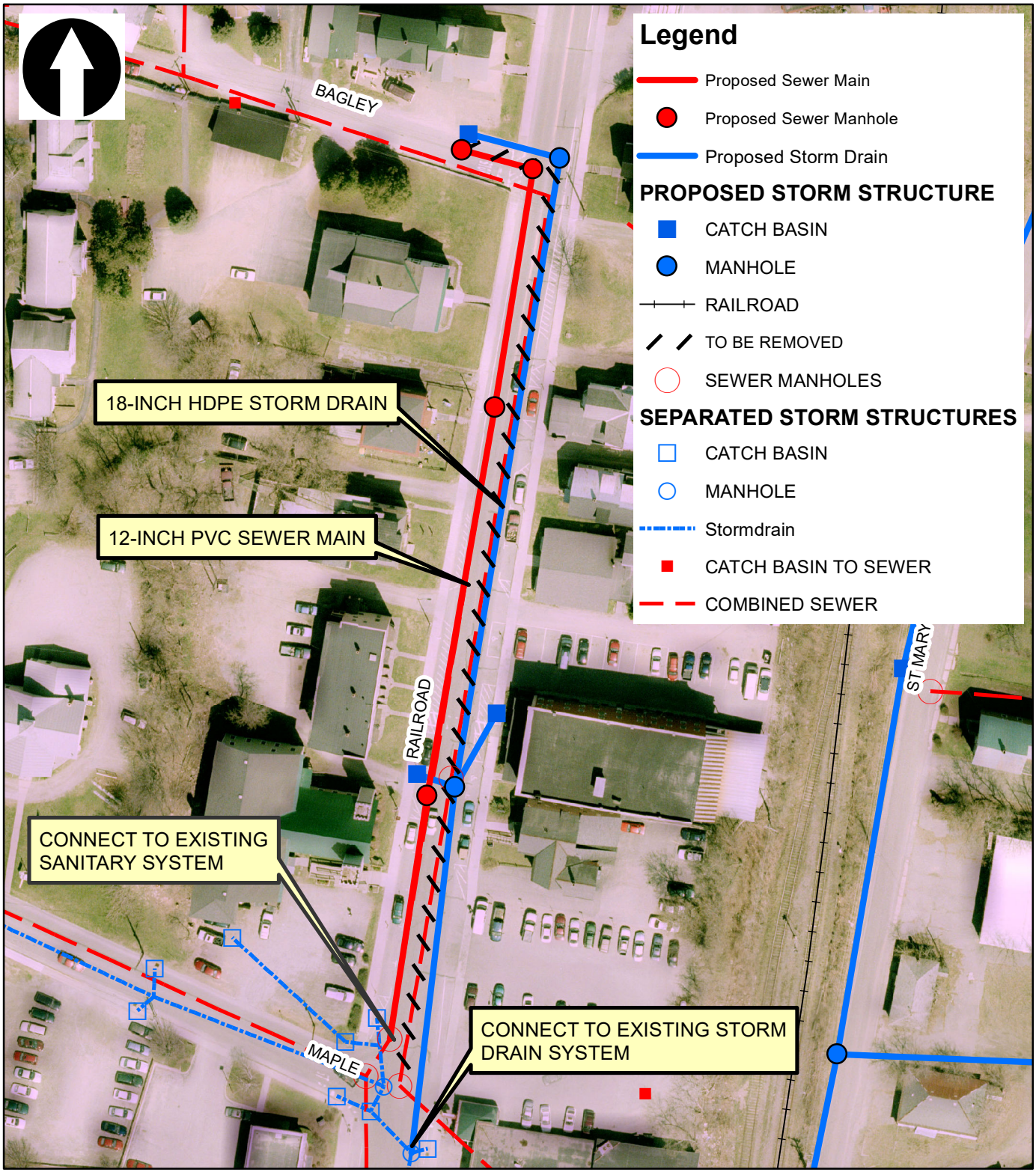
Notes:

1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

Table 4-9 outlines the impact that removing this stormwater would have on CSO 006, 008, and 009:

TABLE 4-9
RAILROAD STREET – BAGLEY TO MAPLE
SEWER AND STORM IMPROVEMENTS
COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	10,325	20,735	26,905	37,665	45,650	55,130
Cost of Reduction per Gallon	$41.40	$20.61	$15.90	$11.35	$9.40	$7.75
WWTF Flow Reduction (gallons)	5,480	3,675	1,880	2,865	6,320	11,025
Estimated Cost to Treat Stormwater ($0.10/Gal)	$550	$370	$190	$290	$635	$1,105



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-5

RAILROAD STREET - BAGLEY TO MAPLE SEWER AND STORM IMPROVEMENTS PROJECT

SAINT JOHNSBURY, VERMONT

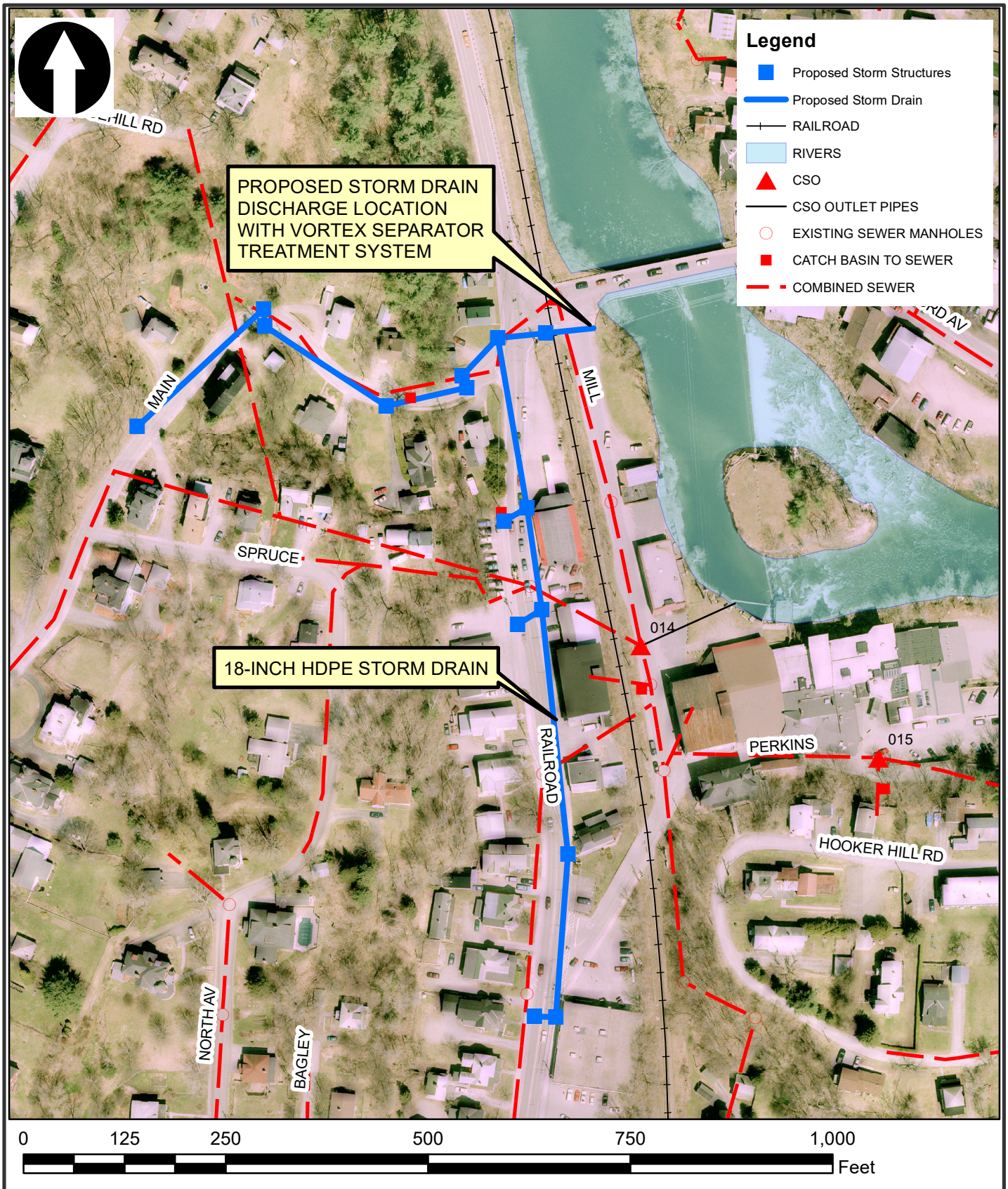
PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 009.MXD

Railroad Street – Main and Mill Storm Improvement Project: Combined sewer from Railroad Street between Main Street and Mill Street is conveyed to Interceptor 1 through two clay tile cross lot mains. By installing new storm along this section of Railroad Street, the flows can be redirected to a stormwater treatment unit that will discharge to the Passumpsic River. The estimated cost to complete this project as shown in Figure 4-6 is $711,740.00, as outlined in Table 4-10.

TABLE 4-10
RAILROAD STREET – MAIN AND MILL
SEWER AND STORM IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	30	VF	$650.00	$19,500.00
2	4'Ø Catch Basin	100	VF	$550.00	$55,000.00
3	18" HDPE Storm Drain	1,620	LF	$90.00	$145,800.00
4	Sidewalk Restoration	40	SY	$85.00	$3,400.00
5	Base Course Pavement	500	TON	$105.00	$52,500.00
6	Top Course Pavement	300	TON	$105.00	$31,500.00
7	Type I Stone Fill	20	CY	$50.00	$1,000.00
8	Railroad Crossing	1	LS	$50,000.00	$50,000.00
9	Vortex Separator	1	LS	$55,000.00	$55,000.00
10	Misc. Work & Cleanup	1	LS	$106,300.00	$106,300.00
				Subtotal	**$520,000.00**
Contingency (10%)					$52,000.00
Engineering					$124,140.00
Legal, Fiscal, Admin (3%)					$15,600.00
				Total	**$711,740.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-6

RAILROAD STREET - MAIN AND MILL STORMWATER SYSTEM PROJECT

SAINT JOHNSBURY, VERMONT

PROJECT NO.	3190007
PROJECT MJR.	AJD
SCALE	AS SHOWN
DATE	DECEMBER 18, 2020
DRAWING NO.	CSO 014.MXD

Table 4-11 outlines the impact that removing this stormwater would have on CSO 014 and the collection system:

Table 4-11
Railroad Street – Main and Mill
Sewer and Storm Improvements Collection System Impacts

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	17,035	47,845	67,910	100,230	127,975	158,900
Cost of Reduction per Gallon	$41.80	$14.88	$10.50	$7.10	$5.60	$4.50
WWTF Flow Reduction (gallons)	15,775	26,000	29,700	32,140	31,780	30,650
Estimated Cost to Treat Stormwater ($0.10/Gal)	$1,580	$2,600	$2,970	$3,220	$3,180	$3,065

Portland Street Storm Improvement Project: Combined sewer from Portland Street between Concord Avenue and Caledonia Street is conveyed to Interceptor 2 through an 18-inch clay tile cross lot main. By installing new storm along this section of Portland Street, the flows can be redirected to an existing stormwater system that discharges to the Moose River. The estimated cost to complete this project as shown in Figure 4-7 is $853,290.00, as outlined in Table 4-12.

Portland Street storm improvement project may also be incorporated into a full street reconstruction project that could address the poor condition of the water main, sewer main, and sidewalks. These costs have not been included in this estimate.

TABLE 4-12
PORTLAND STREET STORM IMPROVEMENTS COST ESTIMATE

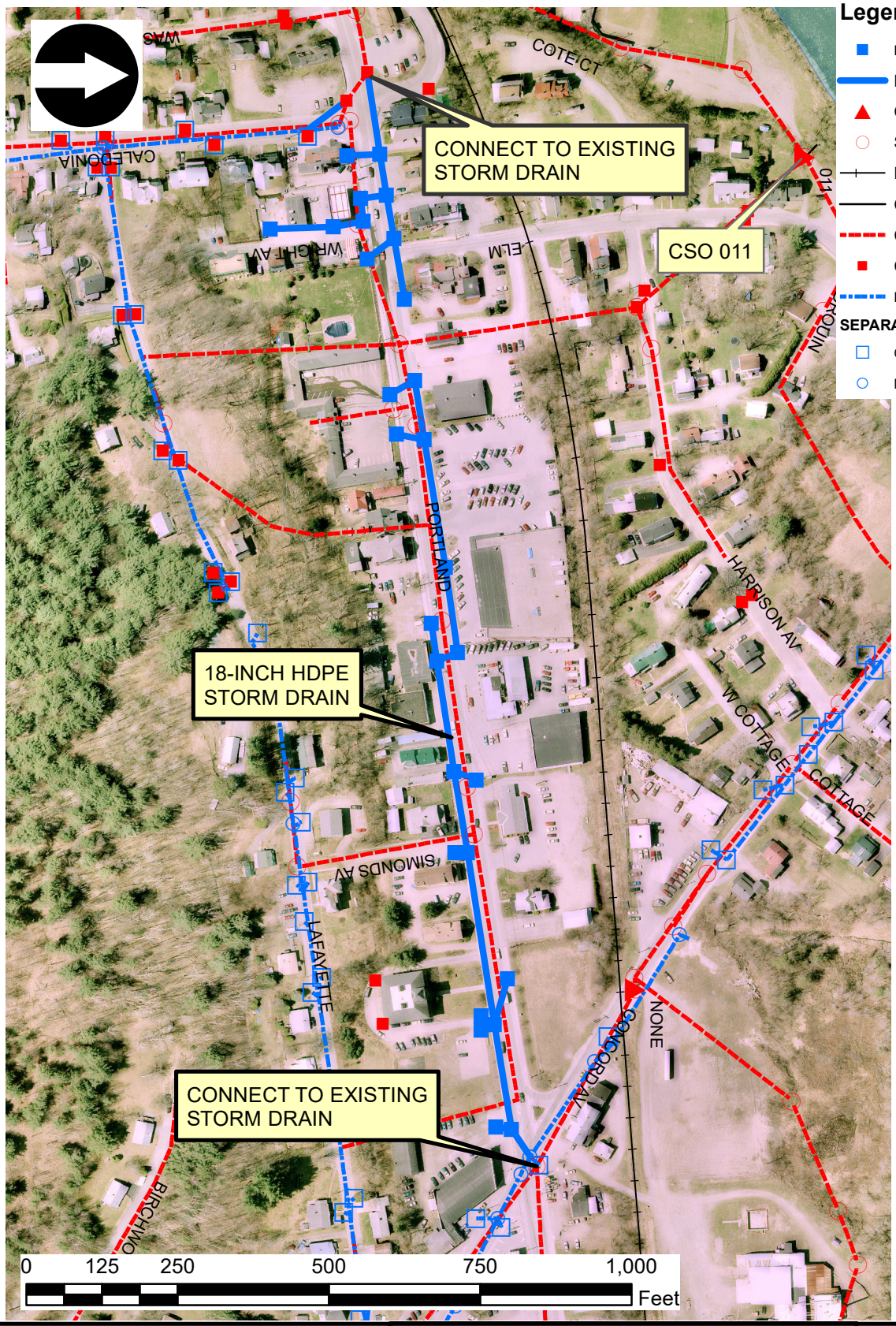
Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Catch Basin	200	VF	$550.00	$110,000.00
2	18" HDPE Storm Drain	2,500	LF	$90.00	$225,000.00
3	Core Existing Structure	2	EA	$500.00	$1,000.00
4	Sidewalk Restoration	160	SY	$85.00	$13,600.00
5	Base Course Pavement	875	TON	$105.00	$91,875.00
6	Top Course Pavement	525	TON	$105.00	$55,125.00
7	Misc. Work & Cleanup	1	LS	$128,400.00	$128,400.00
				Subtotal	**$625,000.00**
Contingency (10%)					$62,500.00
Engineering					$147,040.00
Legal, Fiscal, Admin (3%)					$18,750.00
				Total	**$853,290.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

Table 4-13 outlines the impact that removing this stormwater would have on CSO 011:

TABLE 4-13
PORTLAND STREET STORM IMPROVEMENTS COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	2,960	87,180	141,170	220,830	286,240	360,025
Cost of Reduction per Gallon	$290.00	$9.80	$6.05	$3.90	$3.00	$2.37
WWTF Flow Reduction (gallons)	150,210	309,690	403,680	546,280	659,040	781,500
Estimated Cost to Treat Stormwater ($0.10/Gal)	$15,025	$30,970	$40,370	$54,630	$65,905	$78,150



Legend

- Proposed Catch Basin
- Proposed Storm Drain
- CSO
- SEWER MANHOLES
- RAILROAD
- CSO OUTLET PIPES
- COMBINED SEWER
- CATCH BASIN TO SEWER
- Existing Storm Drain

SEPARATED STORM

- CATCH BASIN
- MANHOLE

DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-7

PORTLAND STREET STORM IMPROVEMENTS PROJECT

SAINT JOHNSBURY, VERMONT

PROJECT NO.	3190007
PROJECT MJR.	AJD
SCALE	AS SHOWN
DATE	DECEMBER 18, 2020
DRAWING NO.	CSO 011.MXD

Increase Storage Capacity

By increasing storage capacity in the collection system, combined flows can be maintained within the system until the wastewater treatment facility can treat it. Several options are available for increasing the storage capacity in the collection system:

1. Increase the main size of the interceptors
2. Install mains that divert the combined flows
3. Install storage devices on the overflow outlets
4. Adjust/replace CSO structures

Interceptor Size

Increasing the interceptor main size would allow for more flow to reach the wastewater treatment plant rather than overflowing. This would reduce the amount of combined sewer overflow, but would increase the cost of treatment at the wastewater treatment plant and the volume received by the plant.

Interceptor 1 currently has the densest number of CSOs of the three interceptors and the small size makes it the best candidate for replacement with larger main. Replacing Interceptor 1 from the wastewater treatment facility with a 21-inch PVC sewer main, as shown in Figure 4-8 will increase the storage availability in the main by approximately 39,300 gallons. The estimated cost to complete this project is $999,775.00, as outlined in Table 4-14.

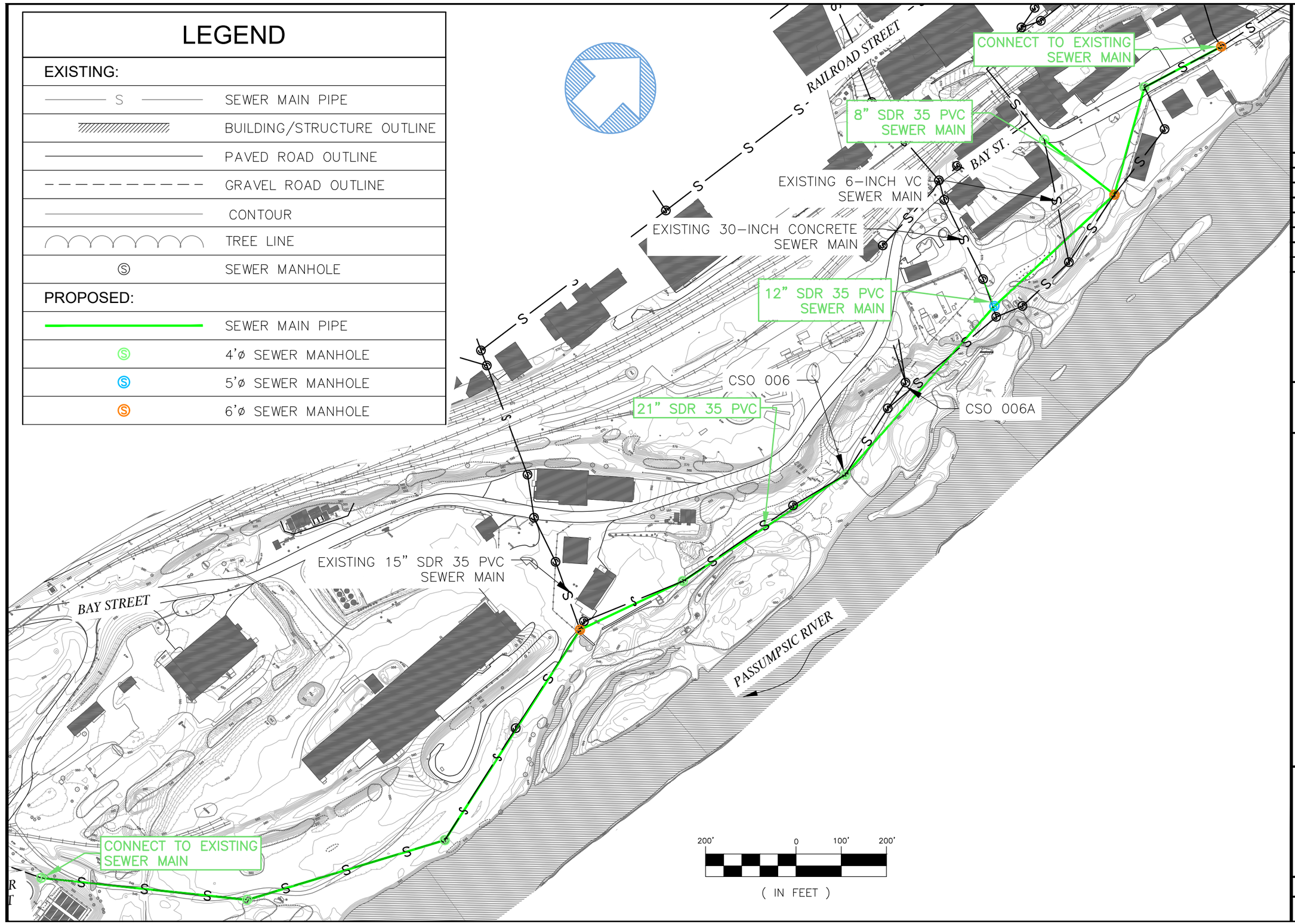
TABLE 4-14
INTERCEPTOR 1 IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	75	VF	$650.00	$48,750.00
2	5'Ø Manhole	15	VF	$725.00	$10,875.00
3	6'Ø Manhole	45	VF	$800.00	$36,000.00
4	21" PVC Sewer Main	3,500	LF	$125.00	$437,500.00
5	12" PVC Sewer Main	50	LF	$85.00	$4,250.00
6	8" PVC Sewer Main	200	LF	$80.00	$16,000.00
7	Trench Pavement	180	SY	$50.00	$9,000.00
8	Misc. Work & Cleanup	1	LS	$171,500.00	$171,500.00
				Subtotal	**$733,875.00**
Contingency (10%)					$73,400.00
Engineering					$170,500.00
Legal, Fiscal, Admin (3%)					$22,000.00
				Total	**$999,775.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

LEGEND

EXISTING:	
S	SEWER MAIN PIPE
	BUILDING/STRUCTURE OUTLINE
	PAVED ROAD OUTLINE
	GRAVEL ROAD OUTLINE
	CONTOUR
	TREE LINE
Ⓢ	SEWER MANHOLE
PROPOSED:	
	SEWER MAIN PIPE
Ⓢ	4'ø SEWER MANHOLE
Ⓢ	5'ø SEWER MANHOLE
Ⓢ	6'ø SEWER MANHOLE



DUFRESNE GROUP
CONSULTING ENGINEERS
Suite 200, 56 Main Street
Springfield, Vermont 05156
Tel: (802) 674-2904 Fax: (802) 674-2913
E-mail: info@dufresnegroup.com
Home page: www.dufresnegroup.com

Project #	3190007
Project Mgr.	AJD
Design	EAE
Drawn	EAE
Checked by	R.E. DUFRESNE
Date	DEC. 18, 2020
Scale	AS SHOWN
Approved by	APPROVED BY

COMBINED SEWER SYSTEM
LONG TERM CONTROL PLAN

FIGURE 4-8
INTERCEPTOR 1 IMPROVEMENT PROJECT

SAINT JOHNSBURY, VERMONT

FIG 4-8

DWG. NO. WEST TRUNKLINE U

SHEET 1 OF 1

FILE: J:\St. Johnsbury VT\3190007 CSO LTCP\CAD\Proposed\WEST TRUNKLINE UPSIZE.dwg Dec 10, 2020 - 10:32am

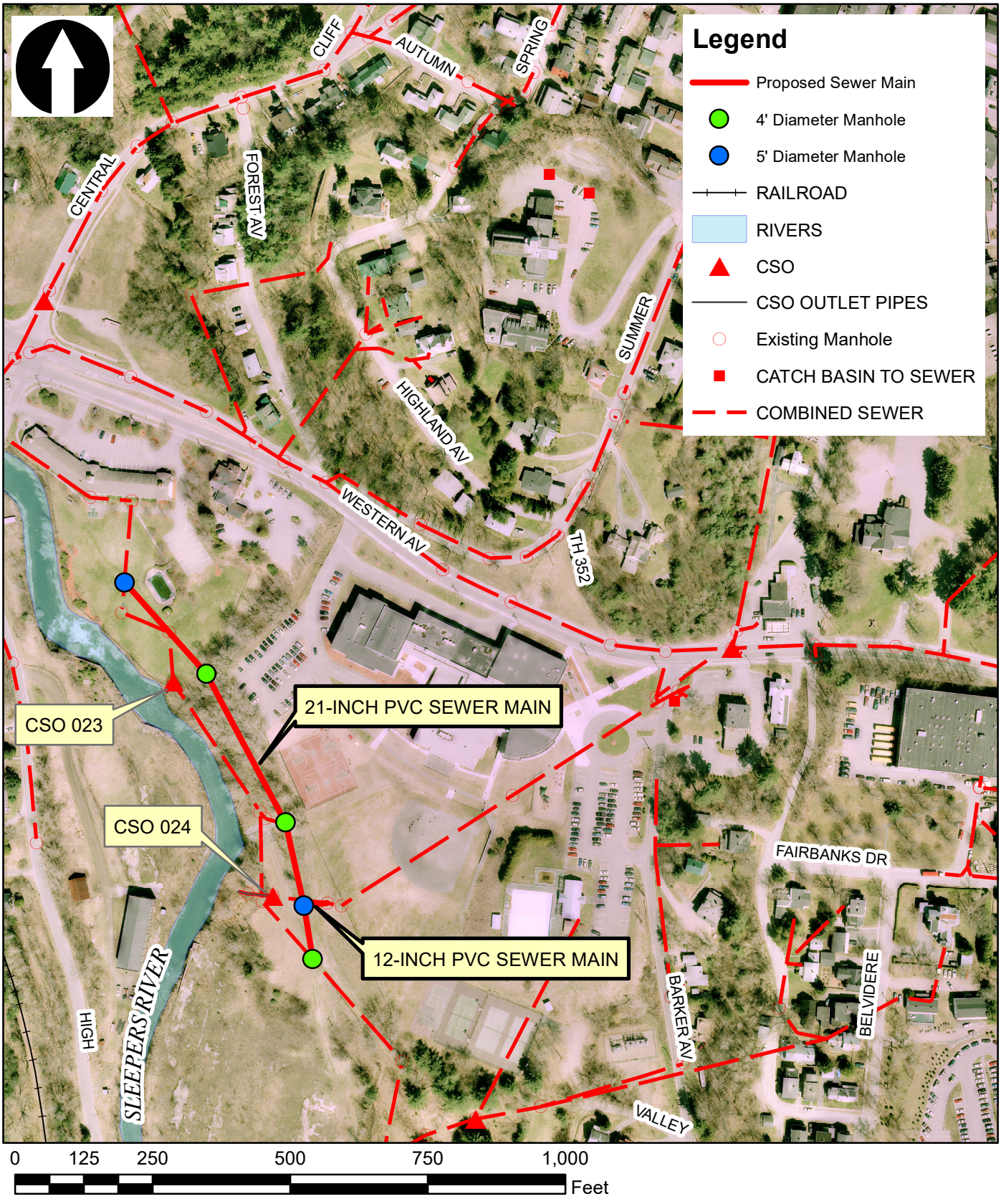
Table 4-15 outlines the impact that removing this stormwater would have on CSO 006, 008 and 009:

TABLE 4-15
INTERCEPTOR 1 IMPROVEMENTS COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	57,915	154,640	211,850	299,470	373,850	457,960
Cost of Reduction per Gallon	$17.25	$6.47	$4.75	$3.40	$2.70	$2.20
Estimated Cost to Treat Stormwater ($0.10/Gal)	$5,800	$15,470	$21,190	$29,950	$37,390	$45,800

Interceptor 2 is already 20-inch AC main and increasing the size is impractical.

Interceptor 3 between CSO 024 and CSO 027 is 12-inches and difficult to access. By replacing interceptor 3 with a 21-inch PVC sewer main, as shown in Figure 4-9, it will increase the storage availability in the main by approximately 9,600 gallons and would allow for increasing the depth of CSO 023 while maintaining the same invert elevation. CSO 023 does not have an outlet pipe and overflow discharges out through the rim of the structure. By relocating the interceptor main further away from the river it will be deeper and more accessible for maintenance. The estimated cost to complete this project is $288,500.00, as outlined in Table 4-16.



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CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-9

INTERCEPTOR 3
IMPROVEMENT PROJECT

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 023.MXD

TABLE 4-16
INTERCEPTOR 3 IMPROVEMENTS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	45	VF	$650.00	$29,250.00
2	5'Ø Manhole	30	VF	$725.00	$21,750.00
3	21" PVC Sewer Main	790	LF	$125.00	$98,750.00
4	12" PVC Sewer Main	45	LF	$85.00	$3,825.00
5	6" PVC Sewer Service	20	LF	$75.00	$1,500.00
6	21"x6" Service Wye	1	EA	$400.00	$400.00
7	Misc. Work & Cleanup	1	LS	$50,600.00	$52,500.00
				Subtotal	**$207,975.00**
Contingency (10%)					$20,800.00
Engineering					$53,400.00
Legal, Fiscal, Admin (3%)					$6,325.00
				Total	**$288,500.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

The following table outlines the impact that removing this stormwater would have on the collection system:

TABLE 4-17
INTERCEPTOR 3 IMPROVEMENTS COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	0	0	0	7	895	2,715
Cost of Reduction per Gallon	0	0	0	$42,050	$310	$102
Estimated Cost to Treat Stormwater ($0.10/Gal)	0	0	0	$0.70	$90	$275

Divert Flows

The existing interceptor mains were installed over 50-years ago with little consideration for access and maintenance. There are also many buildings over the decades that have been removed that the mains had to be installed around. Installing a new main within the Town road right-of-ways where possible will provide additional storage, while increasing access for maintenance.

Bay Street Sanitary Sewer Bypass: Based on topographic contouring shown in the Mapmaker aerial survey, a gravity main could be installed within the Bay Street right-of-way from the wastewater treatment plant to the 30-inch Depot Street sewer main. By installing a 15-inch sewer main along Bay Street, as shown in Figure 4-10, the collection system would gain approximately 25,700 gallons of storage. The estimated cost to complete this project is $833,090.00, as outlined in Table 4-18.

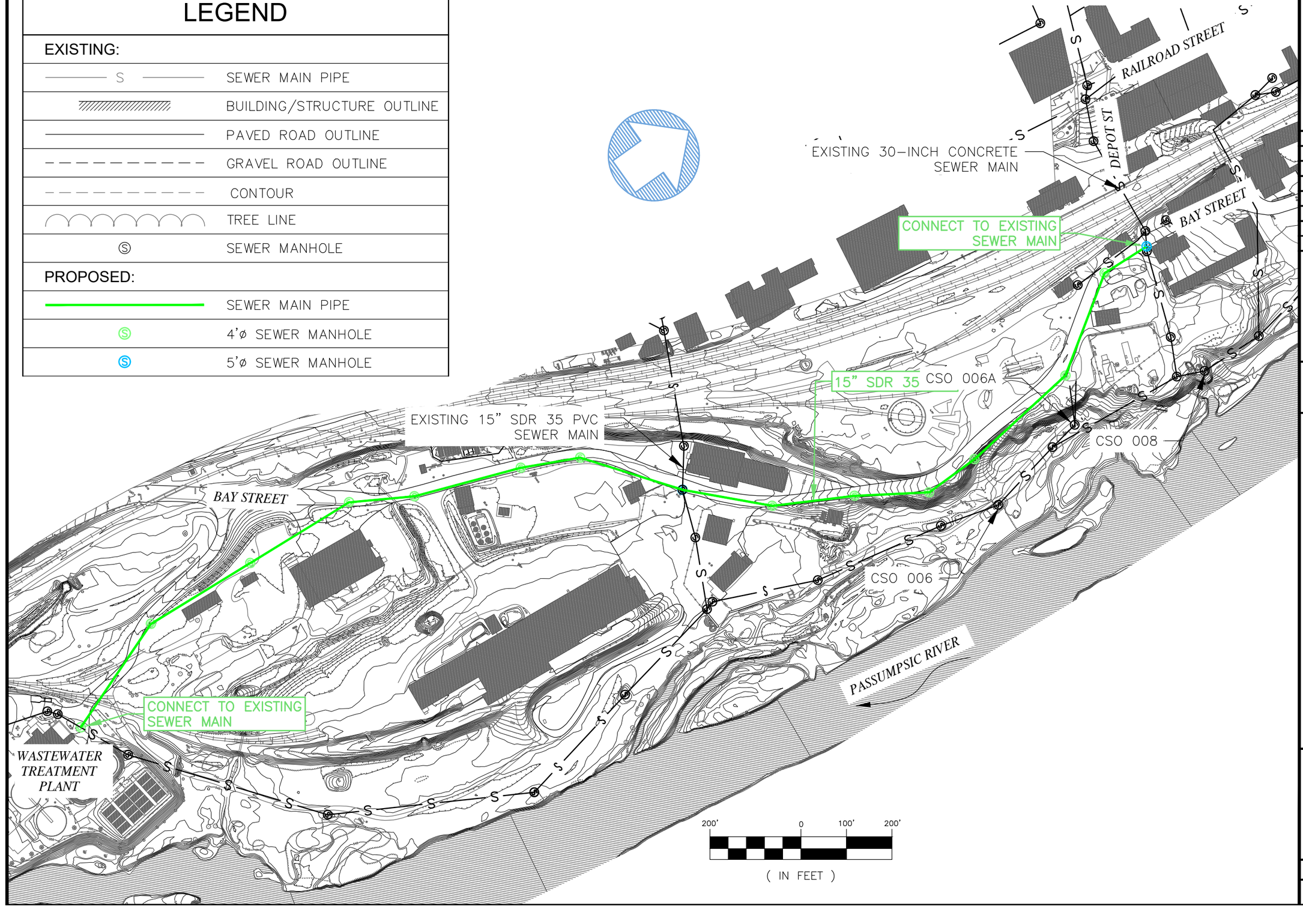
TABLE 4-18
BAY STREET SANITARY SEWER BYPASS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Manhole	160	VF	$650.00	$104,000.00
2	15" PVC Sewer Main	2,800	LF	$105.00	$294,000.00
3	Trench Pavement	1,800	SY	$50.00	$90,000.00
4	Misc. Work & Cleanup	1	LS	$122,000.00	$122,000.00
				Subtotal	**$610,000.00**
Contingency (10%)					$61,000.00
Engineering					$143,790.00
Legal, Fiscal, Admin (3%)					$18,300.00
				Total	**$833,090.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

LEGEND

EXISTING:	
S	SEWER MAIN PIPE
	BUILDING/STRUCTURE OUTLINE
	PAVED ROAD OUTLINE
	GRAVEL ROAD OUTLINE
	CONTOUR
	TREE LINE
Ⓢ	SEWER MANHOLE
PROPOSED:	
	SEWER MAIN PIPE
Ⓢ	4'ø SEWER MANHOLE
Ⓢ	5'ø SEWER MANHOLE



DUFRESNE GROUP
CONSULTING ENGINEERS
Suite 200, 56 Main Street
Springfield, Vermont 05156
Tel: (802) 674-2904 Fax: (802) 674-2913
E-mail: info@dufresnegroup.com
Home page: www.dufresnegroup.com

Project #	3190007
Project Mgr.	AJD
Design	EAE
Drawn	EAE
Checked by	R.E. DUFRESNE
Date	DEC. 18, 2020
Scale	AS SHOWN
Approved by	APPROVED BY

COMBINED SEWER SYSTEM
LONG RANGE CONTROL PLAN

FIGURE 4-10
BAY STREET
SANITARY SEWER BYPASS

SAINT JOHNSBURY, VERMONT

FIG 4-10

DWG. NO. CSO 006 bypass.dwg

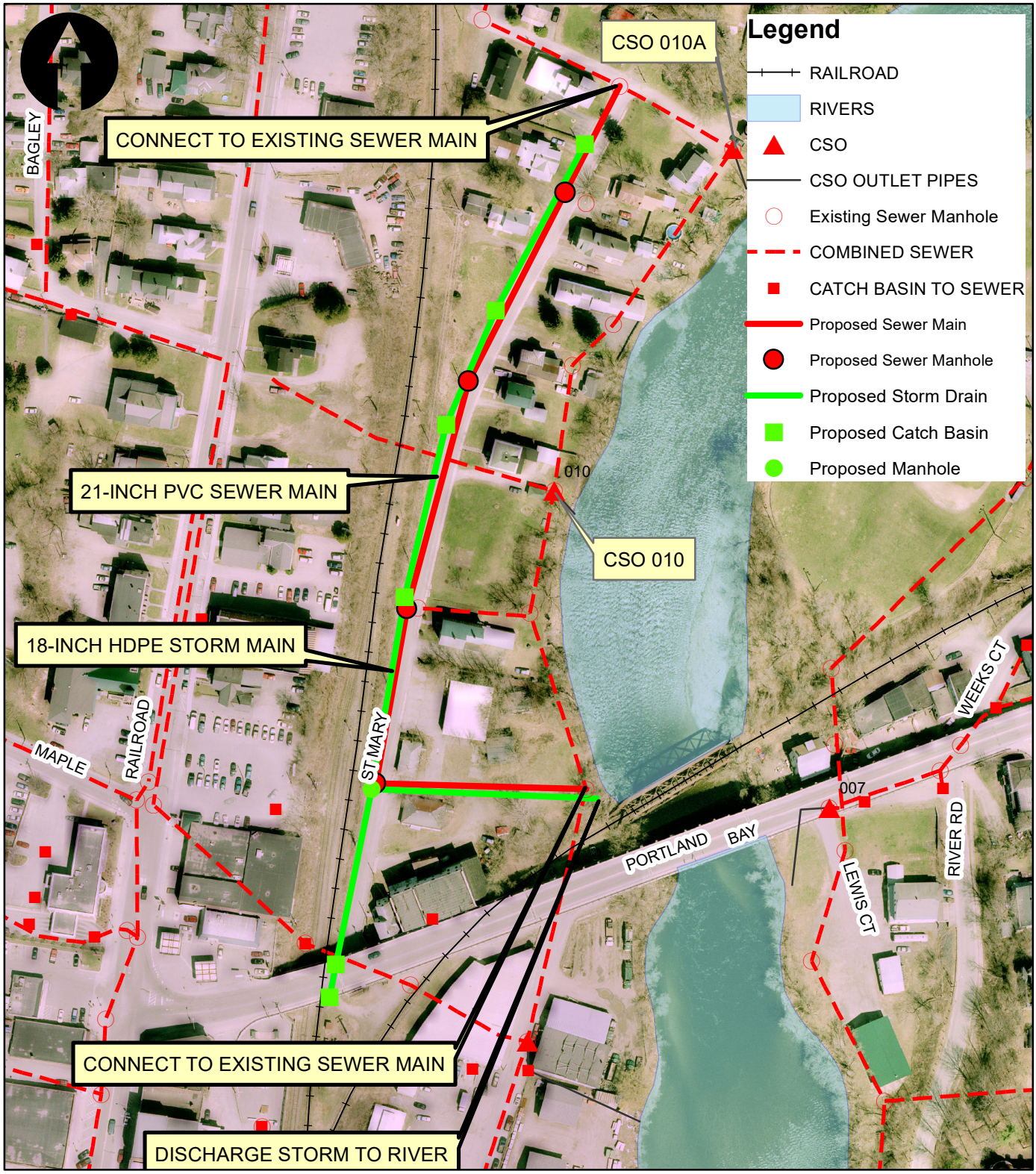
SHEET 1 OF 1

The following table outlines the impact that removing this stormwater would have on CSO 006 and the collection system:

TABLE 4-19
BAY STREET SANITARY SEWER BYPASS COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	19,330	48,300	65,730	92,300	114,890	140,820
Cost of Reduction per Gallon	$43.00	$17.25	$12.70	$9.00	$7.25	$6.00
Estimated Cost to Treat Stormwater ($0.10/Gal)	$1,935	$4,830	$6,575	$9,230	$11,500	$14,080

St. Mary Street Sanitary Sewer Bypass: Interceptor 1 along St. Mary Street runs between the residential homes and the Passumpsic River. Some properties have put additions over the interceptor and some structures are inaccessible. By installing a 21-inch sewer main along St. Mary Street, as shown in Figure 4-11, the collection system would gain approximately 10,600 gallons of storage and provide access necessary for proper maintenance. The estimated cost to complete this project is $413,820.00, as outlined in Table 4-20.



DUFRESNE GROUP
CONSULTING ENGINEERS

481 Summer Street, Suite 8
St. Johnsbury, Vermont 05819
Tel: (802) 748-8605
E-mail: info@dufresnegroup.com
Home page: http://www.dufresnegroup.com

FIGURE NO. 4-11

ST MARY STREET
SANITARY SEWER BYPASS

SAINT JOHNSBURY, VERMONT

PROJECT NO. 3190007
PROJECT MJR. AJD
SCALE AS SHOWN
DATE DECEMBER 18, 2020
DRAWING NO. CSO 010.MXD

TABLE 4-20
ST. MARY STREET SANITARY SEWER BYPASS COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	4'Ø Sewer Manhole	50	VF	$650.00	$32,500.00
2	21" PVC Sewer Main	1,150	LF	$115.00	$132,250.00
3	6" PVC Sewer Service	340	LF	$75.00	$25,500.00
4	21"x6" PVC Service Wye	11	EA	$400.00	$4,400.00
5	4'Ø Storm Manhole	10	VF	$650.00	$6,500.00
6	4' Ø Catch Basin	40	VF	$550.00	$22,000.00
7	18" HDPE Storm Drain	1,310	LF	$90.00	$117,900
8	Trench Pavement	900	SY	$50.00	$45,000.00
9	Core Existing Structure	2	EA	$500.00	$1,000.00
10	Misc. Work & Cleanup	1	LS	$38,700.00	$38,700.00
				Subtotal	**$425,750.00**
Contingency (10%)					$42,575.00
Engineering					$103,270.00
Legal, Fiscal, Admin (3%)					$12,775.00
				Total	**$584,370.00**

Notes:

1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.

The following table outlines the impact that removing this stormwater would have on the collection system:

TABLE 4-21
ST. MARY STREET SANITARY SEWER BYPASS COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	24,900	49,070	61,550	79,880	95,245	112,375
Cost of Reduction per Gallon	$23.50	$12.00	$9.50	$7.30	$6.15	$5.20
WWTF Flow Reduction (gallons)	36,940	45,045	48,760	50,450	49,895	48,590
Estimated Cost to Treat Stormwater ($0.10/Gal)	$3,700	$4,500	$4,875	$5,045	$4,990	$4,860

Although this alternative eliminates the overflow discharges at CSO 010 and 010A, it unfortunately increases the activity of CSO 006, 008 and 009.

Storage Devices

In some cases, municipalities have installed storage devices on the overflow discharges to be stored and released back into the collection system once the storm has subsided. This option requires enough grade for this to be feasible, however most of the interceptor mains slope is around 0.0028 ft/ft. This practice could be possible at CSO 007 and CSO 024.

CSO 007 overflow invert is approximately 14.8’ above the elevation of the interceptor, which would provide elevation necessary to store and reintroduce some of the overflow being discharged. The largest available precast structure can store 10,500 gallons, which would contain up to a 5-year storm. An overflow would still need to be provided to alleviate larger storms. This structure could be located on parcel 024-033-001-000, which is owned by the Town.

CSO 024 overflow invert is approximately 11.0’ above the elevation of the interceptor, which would provide elevation necessary to store and reintroduce the overflow being discharged. A 1,000-gallon precast structure is large enough to detain a 100-year

storm. This structure could be located the property of the St. Johnsbury School near the end of Valley Street.

Table 4-22 provides outlines the impact that this would have on CSO 007 and 024:

TABLE 4-22
CSO 007 AND 024 STORAGE OVERVIEW

CSO	Storm	Total Volume Detained by Structure	Structure Size	Cost
CSO 007	5-year	63,950 Gallons	10,500 Gallons	$24,000.00
CSO 024	100-year	2,725 Gallons	1,000 Gallons	$17,430.00

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Costs are based on 2020 construction.

CSO Replacement/Adjustment

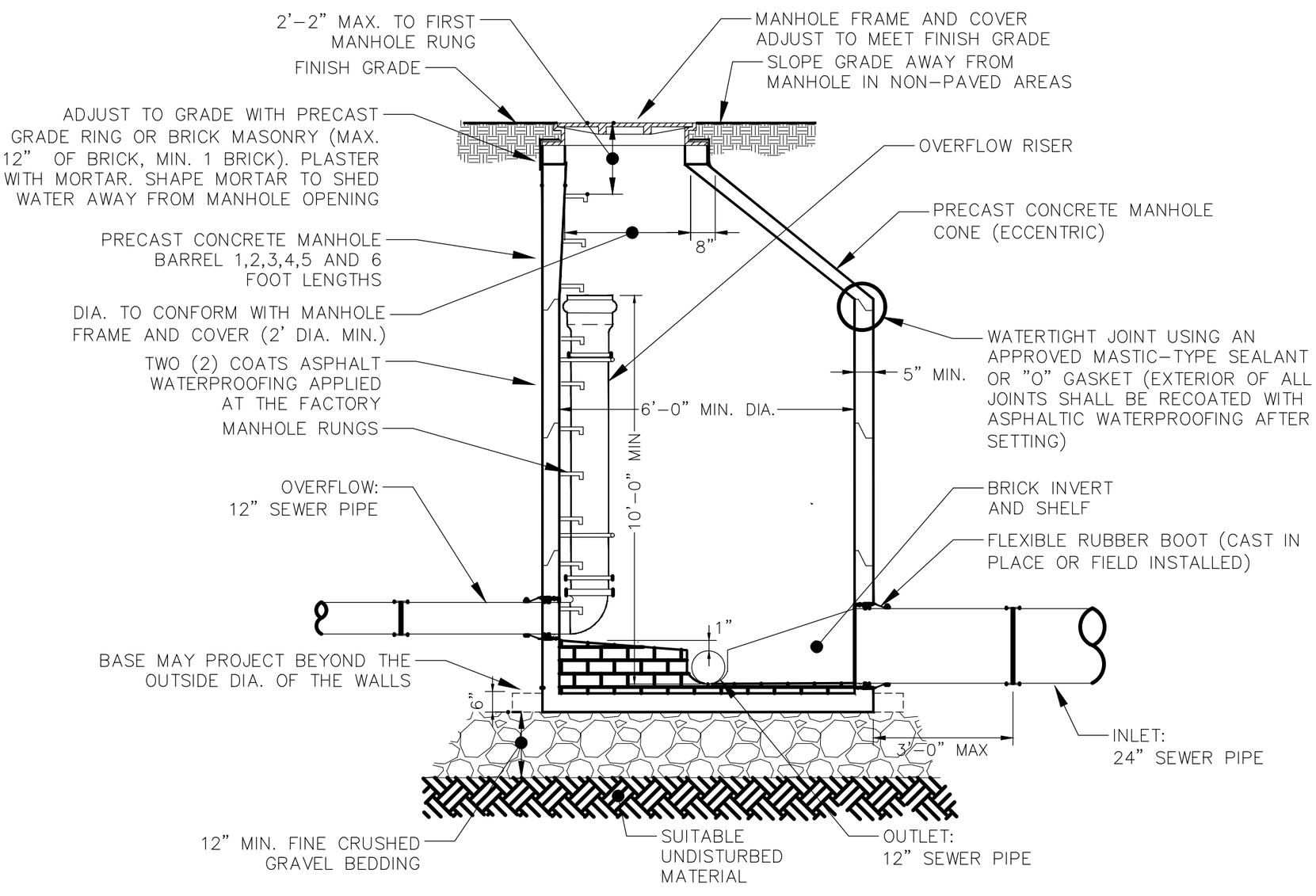
At the time when CSOs were installed, there was little concern as to how much combined sewer was being discharged to the rivers so many of the overflow inverts were close to the same elevation as the inverts out. Some of the overflows over the years have had adjustments made to reduce the frequency of the discharges, such as installation of weirs or pipe stacks to require more surcharging in the manhole prior to discharging. There are still some opportunities to take this further.

CSO 027 on Western Avenue could be replaced with a 6-foot manhole with an overflow 10.0' above the invert out, as shown in Figure 4-12. This would provide approximately 2,100 gallons of storage for storms to be detained. The estimated cost to complete this project is $22,840.00, as outlined in Table 4-23.

TABLE 4-23
CSO 027 STRUCTURE REPLACEMENT COST ESTIMATE

Item No	Description	Estimated Quantity	Units	Unit Price	Total Cost
1	6'Ø Manhole	15	VF	$800.00	$12,000.00
2	24" PVC Sewer Main	5	LF	$115.00	$575.00
3	12" PVC Sewer Main	15	LF	$75.00	$1,125.00
7	Misc. Work & Cleanup	1	LS	$2,100.00	$2,100.00
				Subtotal	**$15,800.00**
Contingency (10%)					$1,580.00
Engineering					$4,980.00
Legal, Fiscal, Admin (3%)					$480.00
				Total	**$22,840.00**

Notes:
1. This construction cost estimate was prepared without the benefit of final design documents. Actual construction costs may vary substantially from these estimates.
2. Engineering is based on the State curve allowance formula.
3. Costs are based on 2020 construction.



PRECAST CONCRETE MANHOLE DETAIL

NOT TO SCALE

DUFRESNE GROUP
CONSULTING ENGINEERS
Suite 200, 56 Main Street
Springfield, Vermont 05156
Tel: (802) 674-2904 Fax: (802) 674-2913
E-mail: info@dufresnegroup.com
Home page: www.dufresnegroup.com

Project #	3190007
Project Mgr.	AJD
Design	EAE
Drawn	EAE
Checked by	R.E. DUFRESNE
Date	DEC. 18, 2020
Scale	AS SHOWN
Approved by	APPROVED BY

COMBINED SEWER SYSTEM
LONG RANGE CONTROL PLAN

FIGURE 4-12
CSO 027 RECONSTRUCTION PROJECT

SAINT JOHNSBURY, VERMONT

FIG 4-12

DWG. NO. CSO 027 replacemen

SHEET 1 OF 1

The following table outlines the impact that detaining this stormwater would have on the collection system:

TABLE 4-24
CSO 027 STRUCTURE REPLACEMENT COLLECTION SYSTEM IMPACTS

Impact	1-Year Storm (1.98-inches)	5-Year Storm (2.94-inches)	10-Year Storm (3.44-inches)	25-Year Storm (4.15-inches)	50-Year Storm (4.67-inches)	100-Year Storm (5.22-inches)
CSO Discharge Reduction (gallons)	2,300	8,125	11,440	16,230	20,660	26,290
Cost of Reduction per Gallon	$9.95	$2.85	$2.00	$1.40	$1.10	$0.90
Estimated Cost to Treat Stormwater ($0.10/Gal)	$230	$815	$1,145	$1,625	$2,070	$2,630

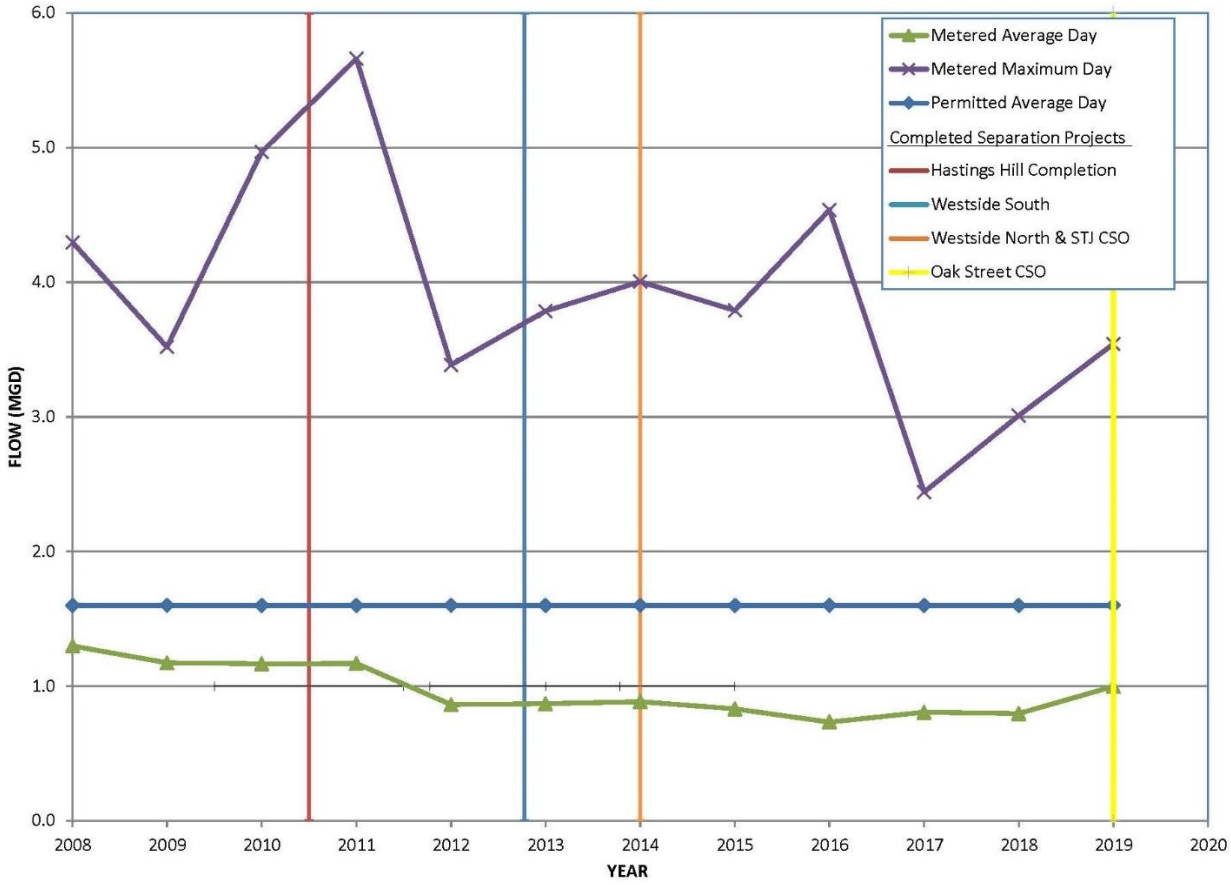
Disconnecting CSO structures that are not discharging is also recommended. The following structures should be eliminated:

- CSO 006A should be disconnected from the system completely. This structure does not receive flow and discharge events appear to be caused by surcharging from the trunkline. This may cause some increase in discharge from CSO 006, but no impact on connections.
- CSO 020 overflow outlets should be disconnected from the structure and capped. Based on routine CSO inspection and hydraulic modeling, elimination of this structure would have no impact on the system or its connections.
- SMH to storm system on Western Avenue at Water Department Road connection should be eliminated. Based on hydraulic modeling, elimination of this structure would have no impact on the system or its connections.

Treatment Plant Capacity

The wastewater treatment plant was designed based on an average day flow of 1.6 MGD and a maximum day flow of 6.9 MGD. The wastewater connections account for approximately 0.65 MGD of the average day flow and 2.5 MGD of the maximum day flow. However, given that the system still has a fair amount of combined collection the metered flow as recorded at the plant, as shown in Image 4-3 below, is higher due to the stormwater collected.

IMAGE 4-3
WWTP FLOW DATA



The Town has completed several projects recently to improve the condition of the WWTP, however they did not increase the capacity of the plant. They have also completed several combined sewer separation projects over the last few decades that have reduced the flow to the WWTP and do provide some additional capacity should additional combined sewer be directed to the plant. Since 2014, the WWTP has experienced an average day flow of 0.833 MGD and a maximum day flow of 3.463 MGD, which is well below the design capacity.

Green Stormwater Treatment

The goal of green stormwater management is to reduce stormwater runoff while increasing ground water recharge through practices that promote infiltration. A Stormwater Master Plan for the Town of St. Johnsbury prepare by Stone Environmental in 2016 identified the following practices often used in urban areas:

- Rain gardens
- Vegetated swales
- Pervious paving
- Stormwater curb extensions
- Trees
- Gravel wetlands

By utilizing green stormwater management practices in locations that currently have unnecessarily wide impervious pavement, Towns can increase the quality of stormwater and the visual appearance of an area, while decreasing the amount of pavement to maintain. One area identified in the Stormwater Master Plan is the intersection of Concord Avenue and Gilman Avenue. This recommendation has been incorporated into the upcoming Pleasant Street and Gilman Avenue Area Water, Sewer and Stormwater Improvements project.

An area that could also benefit from installation of a green stormwater management practice is Portland Street, which contributes to both CSO 007 and 011. Portland Street is over 39-feet wide with curbed sidewalks, as shown in Image 4-4.

Image 4-4 – Portland Street

Portland Street is also currently being evaluated for sidewalk improvements, which could be combined with the stormwater improvements.

Stormwater curb extensions, as shown in Image 4-5, allow stormwater to sheet flow across a pervious surface to promote infiltration prior to being collected in the existing catch basins. Stone can also be placed at curb inlets to reduce the amount of grit entering the combined sewer system. This may be an option for Portland Street.

Image 4-5 – Stormwater Curb Extension Example

CSO Discharge Treatment

For municipalities with limited ability to separate the stormwater from the sanitary sewer, technologies have been developed to improve the quality of the CSO discharge at the location of the CSO structure. In some locations CSO structures could be replaced with a screen system like the Hydro International Hydro-Jet Screen shown in Image 4-6. The Hydro-Jet Screen chamber passes dry weather flow on to the treatment plant, while storm events pass through a screen and siphon chamber prior to being discharged. The screening system ensures all debris larger than 4 millimeter in diameter remains in the wastewater system.

Structures like the Hydro-Jet provide a low capital and life cycle cost alternative. An alternative like this could be utilized at:

- CSO 007
- CSO 009
- CSO 011
- CSO 014

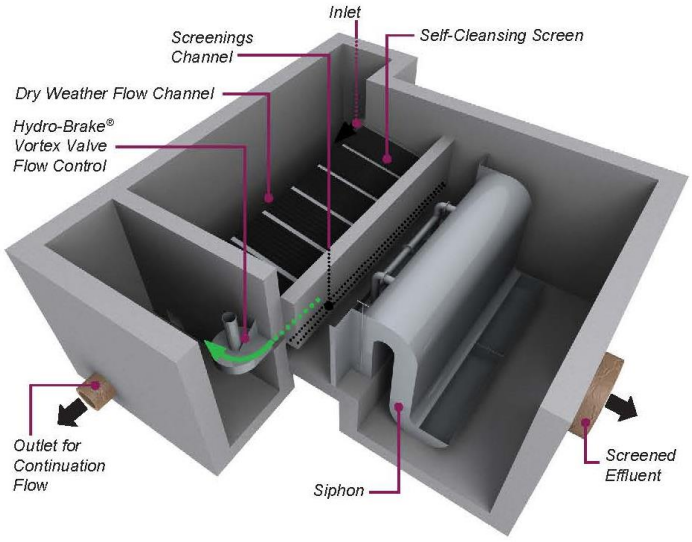


Image 4-6 – Hydro-Jet Screen

Summary and Required Follow-up Actions

Based upon the field investigations, monitoring device information and modeling results, the following is a list of recommended follow-up actions:

1. Modify existing conditions to provide vac-con access to as many interceptor manholes as possible.
2. Review monitoring devices, procedures, and schedule for monitoring with the Town.
3. Perform further camera investigation to verify condition of all segments of the interceptor mains.
4. Complete and submit annual inspection reports for CSOs to document conditions
5. Work to complete the recommended alternatives.

A summary of the alternatives developed and the CSO impacted is presented below in Table 4-25. For some overflow structures, there are a limited number of alternatives. Also, due to the configuration of the wastewater collection system, some projects will impact more than one CSO. Projects that reduce stormwater entering the collection system, also reduce the flow being treated at the WWTP.

TABLE 4-25
ALTERNATIVE SUMMARY

	CSO Impacted - listed by priority																		
Alternative	016	010	006	009	011	008	007	010A	014	024	021	027	023	020	006A	Overflow Reduction for 5-yr storm (gallons)	WWTP flow reduction (gallons)	Total Project Cost	Cost per Gallon of Overflow Reduction
Operation and Maintenance Improvements																			
Install Flow Metering				■			■				■					0	0	$ 25,500.00	N/A
Maintenance Program	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	TBD	Increased flow	$ -	N/A
Separation Projects																			
Barker Avenue	Project underway									■						-	25,875	$ 28,790.00	N/A
Fairbanks Drive												■	■			4,819	6,559	$209,030.00	$ 43.37
Caledonia/Washington							■									76,370	132,660	$332,130.00	$ 4.35
Railroad Street - Bagley to Maple		■	■	■		■										20,735	3,675	$427,410.00	$ 20.61
Railroad Street - Main and Mill									■							47,845	26,000	$711,740.00	$ 14.88
Portland Street					■											87,180	309,690	$853,290.00	$ 9.79
Increase Storage Capacity																			
Interceptor 1			■	■		■										154,640	Increased flow	$999,775.00	$ 6.47
Interceptor 3										■			■			-	Increased flow	$288,500.00	N/A
Divert Flows																			
Bay Street Bypass			■												■	48,300	Increased flow	$833,090.00	$ 17.25
St. Mary Street Bypass		■	■	■		■		■								49,070	45,045	$584,370.00	$ 12.00
Storage Devices																			
10,500 gallons of storage							■									63,950	No change	$ 24,000.00	$ 0.38
1,000 gallons of storage										■						-	No change	$ 17,430.00	$ -
CSO Adjustment/Replacement																			
Manhole Replacement												■				8,125	Increased flow	$ 22,840.00	$ 2.85
Disconnection/Abandonment																			
Disconnect from system															■	N/A	N/A	In house	N/A
Cap overflows														■		N/A	N/A	In house	N/A
Outfall Treatment																			
Install Treatment at Outfall				■	■		■		■							N/A	-	TBD	N/A

Alternatives for CSO 016 are not listed because a project is currently underway to separate the remaining combined sewer that contributes to this CSO.

All CSOs would benefit from a maintenance program and Dufresne Group will work with the Town to improve system maintenance.

Three CSOs were identified as being suitable for abandonment through development of this plan. Those CSOs are 020, 006A and SMH on Western Avenue.

Additional monitoring is recommended at CSO 021. The Town has recorded this CSO as overflowing however the configuration makes it difficult to see the inverts from above and the overflow recordings may be caused by errors during observation or due to leaks within the structure itself. We will work with the Town to improve their CSO monitoring program and to pursue funding to install additional monitoring equipment in this CSO as well as CSO 007 and 009. If funding is available, additional CSO monitoring devices beyond these will be installed.

There is only one alternative, beyond treatment at the outfall for CSOs 010 and 010A which is the St. Mary Street bypass and stormwater project. The replacement of the existing interceptor would provide for a more accessible and easily maintainable piece of infrastructure and it would eliminate one of the more active overflows in Town. It would also reduce the contribution from the Portland Street bridge to CSO 009.

A summary of alternatives organized by CSO is included below in Table 4-26.

TABLE 4-26
ALTERNATIVE SUMMARY BY CSO

CSO	Project	Overflow Reduction for 5-yr storm (gallons)	WWTP flow reduction (gallons)	Total Project Cost	Cost per Gallon of Overflow Reduction
016	Pleasant/Gilman Water, Sewer and Storm Improvements	CSO elimination	CSO elimination	$ 8,466,809.00	
010	St. Mary Street Bypass	49,070	45,045	$ 584,370.00	$ 12.00
	Install flow monitoring	No change	No change	$ 8,500.00	N/A
006	Railroad Street - Bagley to Maple	20,735	3,675	$ 427,410.00	$ 20.61
	Interceptor 1	154,640	Increased flow	$ 999,775.00	$ 6.47
	Bay Street Bypass	48,300	Increased flow	$ 833,090.00	$ 17.25
009	Railroad Street - Bagley to Maple	20,735	3,675	$ 427,410.00	$ 20.61
	Interceptor 1	154,640	Increased flow	$ 999,775.00	$ 6.47
	Install flow monitoring	No change	No change	$ 8,500.00	N/A
	Treatment at outfall				
011	Portland Street	87,180	309,690	$ 853,290.00	$ 9.79
	Treatment at outfall				
008	Railroad Street - Bagley to Maple	20,735	3,675	$ 427,410.00	$ 20.61
	Interceptor 1	154,640	Increased flow	$ 999,775.00	$ 6.47
007	Caledonia/Washington	24,965	60,030	$ 332,130.00	$ 13.30
	10,500 gallons of storage	63,950	No change	$ 24,000.00	$ 0.38
	Install flow monitoring	No change	No change	$ 8,500.00	N/A
	Treatment at outfall				
010A	St. Mary Street Bypass	49,070	45,045	$ 584,370.00	$ 12.00
014	Railroad Street - Main and Mill	47,845	26,000	$ 711,740.00	$ 14.88
	Treatment at outfall				
024	Barker Avenue	-	25,875	$ 28,790.00	N/A
	1,000 gallons of storage	-	No change	$ 17,430.00	$ -
	Interceptor 3	-	Increased flow	$ 288,500.00	
021	Install flow monitoring	No change	No change	$ 8,500.00	
027	Fairbanks Drive	4,819	6,559	$ 209,030.00	$ 43.37
	Manhole Replacement	8,125	Increased flow	$ 22,840.00	$ 2.85
023	Interceptor 3	-	Increased flow	$ 288,500.00	N/A
	Fairbanks Drive	4,819	6,559	$ 209,030.00	$ 43.37
020	Cap overflows	N/A	N/A	In house	
006A	Disconnect from system	N/A	N/A	In house	
SMH	Western Ave - Disconnect from system	N/A	N/A	In house	

To address CSOs with more than one alternative, additional considerations needed to be weighed. When selecting an alternative cost is not necessarily the only comparison that should be taken into consideration. Alternatives are judged based on the likelihood they will reduce pollutant loads and ensure designated uses can be achieved. For example, “External Actions Required” will be judged on whether finances, permits, changes to specifications, or other requirements are needed, and “Effect on Other Systems” will be evaluated to determine if the alternative will transfer the flow (and water quality issues) to other infrastructure systems, in particular stormwater drainage systems. Alternatives for each CSO are evaluated using this system in order of frequency of overflow are presented below.

CSO 006

CSO 006 is located off Bay Street and from February 2019 through August 2020, 24 overflows were reported by the Town of St. Johnsbury. Three alternatives were considered for CSO 006 as shown on Table 4-27 below.

TABLE 4-27
CSO 006 ALTERNATIVE SCORING

CSO 006	Alternatives		
Parameter	Railroad Street - Bagley to Maple	Interceptor 1	Bay Street Bypass
Ability to reduce or eliminate CSOs	4	8	6
Design & construction cost efficiency	5	8	6
Construction duration	8	4	5
Operation & Maintenance Costs	5	5	5
Aesthetics	5	5	5
Environmental Impacts	5	2	3
Land Availability/Requirements	5	2	5
Effects of Sensitive Receptors	8	2	5
Community Concerns	5	4	3
Other Infrastructure Conflicts	5	2	8
Phasing Requirements	5	5	5
Permits & Environmental	5	2	5
External Actions Required	5	5	5
Effect on other systems	8	8	1
Alternative Score	78	62	67

Based on the scoring of the alternatives for CSO 006, the separation project on Railroad Street from Bagley to Maple Street is the recommended alternative.

CSO 009

CSO 009 is located off Bay Street near the Portland Street bridge and from February 2019 through August 2020, 23 overflows were reported by the Town of St. Johnsbury. Three alternatives were considered for CSO 009 as shown on Table 4-28 below.

TABLE 4-28
CSO 009 ALTERNATIVE SCORING

CSO 009	Alternatives		
Parameter	Railroad Street - Bagley to Maple	Interceptor 1	Treatment on Outfall
Ability to reduce or eliminate CSOs	4	8	8
Design & construction cost efficiency	8	5	8
Construction duration	8	4	8
Operation & Maintenance Costs	5	5	2
Aesthetics	5	5	2
Environmental Impacts	5	2	2
Land Availability/Requirements	5	2	2
Effects of Sensitive Receptors	8	2	2
Community Concerns	5	4	2
Other Infrastructure Conflicts	5	2	5
Phasing Requirements	5	5	5
Permits & Environmental	5	2	5
External Actions Required	5	5	5
Effect on other systems	8	8	5
Alternative Score	81	59	61

Based on the scoring of the alternatives for CSO 009, the separation project on Railroad Street from Bagley to Maple Street is the recommended alternative.

CSO 011

CSO 011 is located near the Legion baseball fields off Elm Street and from February 2019 through August 2020, 19 overflows were reported by the Town of St. Johnsbury. Two alternatives were considered for CSO 011 as shown on Table 4-29 below.

TABLE 4-29
CSO 011 ALTERNATIVE SCORING

CSO 011	Alternatives	
Parameter	Portland Street	Treatment on Outfall
Ability to reduce or eliminate CSOs	8	8
Design & construction cost efficiency	10	8
Construction duration	5	8
Operation & Maintenance Costs	5	2
Aesthetics	5	2
Environmental Impacts	5	2
Land Availability/Requirements	5	2
Effects of Sensitive Receptors	8	2
Community Concerns	5	2
Other Infrastructure Conflicts	5	5
Phasing Requirements	5	5
Permits & Environmental	2	5
External Actions Required	5	5
Effect on other systems	8	5
Alternative Score	81	61

Based on the scoring of the alternatives for CSO 011, the separation project on Portland Street is the recommended alternative. Complete street and utility replacement on Portland Street is part of the long term plan for the Town of St. Johnsbury.

CSO 008

CSO 008 is located off Bay Street east of Allen Lumber and from February 2019 through August 2020, 17 overflows were reported by the Town of St. Johnsbury. Two alternatives were considered for CSO 008 as shown on Table 4-30 below.

TABLE 4-30
CSO 008 ALTERNATIVE SCORING

CSO 008	Alternatives	
Parameter	Railroad Street - Bagley to Maple	Interceptor 1
Ability to reduce or eliminate CSOs	4	8
Design & construction cost efficiency	5	8
Construction duration	8	4
Operation & Maintenance Costs	5	5
Aesthetics	5	5
Environmental Impacts	5	2
Land Availability/Requirements	5	2
Effects of Sensitive Receptors	8	2
Community Concerns	5	4
Other Infrastructure Conflicts	5	2
Phasing Requirements	5	5
Permits & Environmental	5	2
External Actions Required	5	5
Effect on other systems	8	8
Alternative Score	78	62

Based on the scoring of the alternatives for CSO 008, the separation project on Railroad Street from Bagley to Maple Street is the recommended alternative.

CSO 007

CSO 007 is located off Bay Street on the east side of the Passumpsic River near the Portland Street bridge and from February 2019 through August 2020, 16 overflows were reported by the Town of St. Johnsbury. Three alternatives were considered for CSO 007 as shown on Table 4-31 below.

TABLE 4-31
CSO 007 ALTERNATIVE SCORING

CSO 007	Alternatives		
Parameter	Caledonia/ Washington	10,500 Gallons of Storage	Treatment on Outfall
Ability to reduce or eliminate CSOs	8	4	8
Design & construction cost efficiency	4	8	8
Construction duration	6	8	8
Operation & Maintenance Costs	2	6	2
Aesthetics	6	2	2
Environmental Impacts	5	2	2
Land Availability/Requirements	5	2	2
Effects of Sensitive Receptors	8	2	2
Community Concerns	5	3	2
Other Infrastructure Conflicts	4	6	5
Phasing Requirements	5	5	5
Permits & Environmental	5	4	5
External Actions Required	5	5	5
Effect on other systems	6	2	5
Alternative Score	74	59	61

Based on the scoring of the alternatives for CSO 007, the separation project on Caledonia Street and Washington Street is the recommended alternative.

CSO 014

CSO 014 is located off Mill Street and from February 2019 through August 2020, 15 overflows were reported by the Town of St. Johnsbury. Two alternatives were considered for CSO 014 as shown on Table 4-32 below.

TABLE 4-32
CSO 014 ALTERNATIVE SCORING

CSO 014	Alternatives	
Parameter	Railroad Street - Main and Mill	Treatment on Outfall
Ability to reduce or eliminate CSOs	8	8
Design & construction cost efficiency	10	8
Construction duration	5	8
Operation & Maintenance Costs	5	2
Aesthetics	5	2
Environmental Impacts	5	2
Land Availability/Requirements	5	2
Effects of Sensitive Receptors	8	2
Community Concerns	5	2
Other Infrastructure Conflicts	5	5
Phasing Requirements	5	5
Permits & Environmental	2	5
External Actions Required	5	5
Effect on other systems	8	5
Alternative Score	81	61

Based on the scoring of the alternatives for CSO 014, the separation project on Railroad Street from Main and Mill Street is the recommended alternative.

CSO 024

CSO 024 is located behind the St. Johnsbury School and from February 2019 through August 2020, 9 overflows were reported by the Town of St. Johnsbury. Three alternatives were considered for CSO 006 as shown on Table 4-33 below.

TABLE 4-33
CSO 024 ALTERNATIVE SCORING

CSO 024	Alternatives		
Parameter	Barker Avenue	1,000 gallons of storage	Interceptor 3
Ability to reduce or eliminate CSOs	8	6	2
Design & construction cost efficiency	8	8	6
Construction duration	7	8	5
Operation & Maintenance Costs	7	4	8
Aesthetics	5	2	5
Environmental Impacts	5	4	3
Land Availability/Requirements	5	2	2
Effects of Sensitive Receptors	8	4	4
Community Concerns	5	4	4
Other Infrastructure Conflicts	5	5	4
Phasing Requirements	5	5	5
Permits & Environmental	5	5	3
External Actions Required	5	5	5
Effect on other systems	2	2	8
Alternative Score	80	64	64

Based on the scoring of the alternatives for CSO 024, the separation project on Barker Avenue is the recommended alternative. The replacement of Interceptor 3 is also recommended as a future project due to difficulty in maintaining and accessing Interceptor 3 in its current location.

CSO 027

CSO 027 is located off Western Avenue near Mt. Vernon Street and from February 2019 through August 2020, 5 overflows were reported by the Town of St. Johnsbury. Two alternatives were considered for CSO 027 as shown on Table 4-34 below.

TABLE 4-34
CSO 027 ALTERNATIVE SCORING

CSO 027	Alternatives	
Parameter	Fairbanks Drive	Manhole Replacement
Ability to reduce or eliminate CSOs	4	8
Design & construction cost efficiency	4	8
Construction duration	5	8
Operation & Maintenance Costs	2	6
Aesthetics	5	5
Environmental Impacts	5	5
Land Availability/Requirements	5	4
Effects of Sensitive Receptors	5	5
Community Concerns	3	5
Other Infrastructure Conflicts	5	5
Phasing Requirements	5	5
Permits & Environmental	4	6
External Actions Required	4	6
Effect on other systems	8	2
Alternative Score	64	78

Based on the scoring of the alternatives for CSO 027, manhole replacement is the recommended alternative. However, the work on Fairbanks Drive is the recommended project for CSO 027. Given the cost difference, manhole replacement may be something that could be completed as an interim solution until the Fairbanks Drive project can be completed.

CSO 023

CSO 023 is located behind the Fairbanks Inn off Western Avenue and from February 2019 through August 2020, 4 overflows were reported by the Town of St. Johnsbury. Two alternatives were considered for CSO 023 as shown on Table 4-35 below.

TABLE 4-35
CSO 023 ALTERNATIVE SCORING

CSO 023	Alternatives	
Parameter	Fairbanks Drive	Interceptor 3
Ability to reduce or eliminate CSOs	8	4
Design & construction cost efficiency	6	5
Construction duration	5	5
Operation & Maintenance Costs	4	6
Aesthetics	5	5
Environmental Impacts	5	4
Land Availability/Requirements	6	4
Effects of Sensitive Receptors	5	4
Community Concerns	3	5
Other Infrastructure Conflicts	5	5
Phasing Requirements	5	5
Permits & Environmental	6	4
External Actions Required	5	5
Effect on other systems	6	6
Alternative Score	74	67

Based on the scoring of the alternatives for CSO 023, the separation project on Fairbanks Drive is the recommended alternative. However, a future project that includes replacement of Interceptor 3 is recommended to improve access and maintenance of this main.

Recommended Projects

A summary of the recommended projects in order of priority is included below in Table 4-36. Projects are prioritized based on cost and impact on CSO elimination. These priorities may change based on available funding and other planned utility projects.

TABLE 4-36
RECOMMENDED PROJECTS

Priority	CSO Impacted	Project	Notes	Cost
1	All	Review and update monitoring and maintenance program	Work with Town to review and update existing procedures	
2	020, 006A, SMH Western	Cap overflow and disconnect	Abandons existing CSOs	Complete in house
3	007, 009, 010, 010A, 014, 020, 021, 023, 024, 027	Add flow monitoring equipment	Additional monitoring will help quantify overflows	$ 94,500
4	007	Caledonia/Washington	Completes previous separation project	$ 332,130
5	011	Portland Street	Part of overall complete street and utility project planned for Portland Street	$ 853,290
6	006, 009, 008, 010	Railroad Street - Bagley to Maple	Addresses multiple CSOs	$ 427,410
7	023, 027	Fairbanks Drive	Although manhole replacement scored higher for 027, Fairbanks drive scored higher for 023	$ 209,030
8	024	Barker Avenue	Small project to disconnect storm that may be able to be combined with the Fairbanks Drive project	$ 28,790
9	010, 010A	St. Mary Street Bypass	Eliminates CSOs and Improves maintenance access	$ 584,370
10	014	Railroad Street - Main and Mill	Separation project that eliminates cross lot combined sewer.	$ 711,740
11	024, 023	Interceptor 3	Eliminates CSOs, Although this project didn't score above others, it is necessary for access to the interceptor that has had maintenance issues.	$ 288,500

SECTION 5
RECOMMENDED PROJECTS
PRELIMINARY ENGINEERING REPORT
COMBINED SEWER LONG TERM CONTROL PLAN
ST. JOHNSBURY, VERMONT
December 18, 2020

Prioritized List of Projects

A prioritized list of projects was presented in Section 4 that starts with reviewing the Town's monitoring and maintenance program, abandoning inactive Combined Sewer outfalls and installing additional monitoring equipment. The project proposed after this work is done include combined sewer separation and interceptor replacement projects.

The proposed project schedule shown in Table 5-1 is based on several criteria including the following factors:

- The need for the improvements as defined by local officials.
- The rate effect of the project and implementation of rate increases.
- Funding requirements.

TABLE 5-1
PROJECT SCHEDULE

Priority	CSO Impacted	Project	Schedule
1	All	Review and update monitoring and maintenance program	Spring 2021
2	020, 006A, SMH Western	Cap overflow and disconnect	Spring 2021
3	007, 009, 010, 010A, 014, 020, 021, 023, 024, 027	Add flow monitoring equipment	Summer 2021
4	007	Caledonia/Washington	2025-2026
5	011	Portland Street	2025-2026
6	006, 009, 008, 010	Railroad Street - Bagley to Maple	2027-2028
7	023, 027	Fairbanks Drive	2029-2030
8	024	Barker Avenue	To Be Determined
9	010, 010A	St. Mary Street Bypass	To Be Determined
10	014	Railroad Street - Main and Mill	To Be Determined
11	024, 023	Interceptor 3	To Be Determined

This project schedule is based on several items beyond the control of the Town of St. Johnsbury including the availability of funding, the time necessary to obtain permits, the time the regulatory and funding agencies need to review plans and specifications, and

the success or failure of local bond votes. The schedule will be updated with the next Long Term Control Plan update and based on additional data collected from increased monitoring.

Rights-of-Way Summary

Rights-of-way for the proposed projects were researched by Truline Land Surveyors and provided as a letter report dated October 16, 2020. The report is attached in Appendix C.

Permit Summary

Permit requirements for the proposed project are limited because work is anticipated to remain within the Town owned right-of-way. At this time, we anticipate the following permits and approvals may be required for the project:

- Vermont Agency of Natural Resources Facilities Engineering Department
- Stormwater Construction General Permit
- Stormwater Discharges from new Development and Redevelopment General Permit 3-9015

For projects that involve disturbance of asbestos cement pipe, an asbestos management work plan will be required.

Project Cost Estimates

The 2020 construction cost for each project is shown below in Table 5-2.

TABLE 5-2
PROJECT COST

Project	Total Project Cost
Review and update monitoring and maintenance program	$ -
Cap overflow and disconnect	Complete in house
Add flow monitoring equipment	$ 93,180.00
Caledonia/Washington	$ 332,130.00
Railroad Street - Bagley to Maple	$ 427,410.00
Portland Street	$ 853,290.00
St. Mary Street Bypass	$ 584,370.00
Fairbanks Drive	$ 209,030.00
Barker Avenue	$ 28,790.00
Railroad Street - Main and Mill	$ 711,740.00
Interceptor 3	$ 288,500.00

The first project is able to be completed with little capital expenditure by the Town. The Town is already pursing available funding from the Clean Water State Revolving Fund (CWSRF) for the additional flow monitoring equipment that will provide 100% loan

forgiveness. The remaining projects are proposed to be completed over the next ten years however that schedule may be ambitious. In addition, given that funding programs may change during that time period, the funding for only the first infrastructure project is presented in this section.

Assuming construction costs increase by 3% each year, and construction for the separation project on Caledonia Street and Washington Street doesn't start until 2022, the 2022 total project cost is estimated at $352,400. If the Town chooses to replace additional utilities such as water during construction of this project, the construction cost would increase accordingly.

Annual Operating Budget

Revenue:

The Sewer Department receives the majority of its revenue through user charges. Sewer users are billed based on their metered water consumption. St. Johnsbury bills on a quarterly basis with a minimum fixed rate of $83.83/quarter per 19,999 gallons used and a consumptive rate of $4.28 per 1,000 gallons. The fixed rate portion of the bill increases based on user consumption; Table 5-3 provides the current sewer user rates.

TABLE 5-3
CURRENT SEWER USER RATES

User Consumption (Gallons per Quarter)	Fixed Rate (Base Cost)	Consumptive Rate (Cost per 1,000 Gallons)
0 to 19,999	$83.83	$4.28
20,000 to 35,999	$129.28	$4.28
36,000 to 249,999	$399.96	$4.28
250,000 to 999,999	$532.27	$4.28
Over 1,000,000	$667.67	$4.28

Note:
1. Rates listed above were provided by the Town of St. Johnsbury.

A typical water user who consumes 210 gpd of water would accumulate an estimated 19,162 gallons of water per quarter. Based on the current sewer rates, the typical sewer user would incur a total annual sewer bill of $660.60. Approximately 78% of St. Johnsbury customers use up to 19,999 gallons per quarter.

The 2019-2020 budgeted revenue received by the Sewer Fund for Sewer Usage Charges is $1,549,350, which includes income from delinquent fees, penalty and interest charges, and grant reimbursements. There is also $55,000 in reserve fund. A copy of the 2019-2020 Sewer Budget is included in Appendix B.

Expenditures:

The expenditures for 2019-2020 budget are summarized as follows:

Operation and Maintenance Expenses	$ 1,086,790

Principal and Interest on long-term Debt	$ 474,498
Total 2018 Budgeted Expenditures	$ 1,561,288

Proposed Financing

The Town of St. Johnsbury does not have the funds to finance the proposed sanitary and storm sewer improvements locally and therefore the Town must take on long-term debt to finance the proposed project. Funding alternatives include local borrowing through the Municipal Bond Bank, the Clean Water State Revolving Fund (CWSRF) program, and the United States Department of Agriculture Rural Development (RD) water and wastewater grant/loan program.

The concepts and customer costs outlined in this section represent our interpretation of these different program requirements and should not be considered a guarantee of a grant/loan offer. Town officials will be required to obtain a written offer of funding from an agency representative.

Funding Capital Costs through Local Borrowing:

If local borrowing was used exclusively to fund the capital costs, with a 30-year bond at 3.875% interest using conventional funding from the State Bond Bank, the annual cost for the capital improvements total of $352,400 is approximately $20,000 per year and a total end cost of $600,600.

Clean Water State Revolving Fund (CWSRF):

The U.S. Environmental Protection Agency and the Vermont Agency of Natural Resources have developed a program to help local communities fund wastewater and stormwater projects with the intent of preventing untreated wastewater and stormwater from reaching rivers and lakes. The CWSRF offers both grants and loans for projects that work to eliminate pollutants from infrastructure entering water ways. Wastewater Treatment and CSO abatement is a high priority, as untreated sewage can be discharged into surface waters from combined sewer collection systems.

Grants applicable to the CWSRF program are subject to availability of state pollution control grant funding. Combined sewer overflow abatement projects may be granted up to 35% of eligible costs pending available pollution control grant funding subject to availability and on points earned through the priority system defined in the Environmental Projection Rule, Chapter 2. In addition to the pollution control grant, green stormwater portions would be eligible for forgiveness under the Act 185 sponsorship program.

In addition to the potential pollution control grant, applicants are eligible for additional subsidy for preliminary engineering and final design phases of a project. Subsidy is applied as principle forgiveness of 50% of the preliminary engineering or final design phase cost up to $100,000, not to exceed $250,000 per borrower.

CWSRF loans have a maximum term length of 30 years, which is dependent on the life of the constructed asset, with an annual interest rate of 0%. CWSRF loans do not

contain terms that result in a penalty for earlier repayment or refinancing. These loans do require a 2% administrative fee which is utilized to fund the administration of the CWSRF program.

USDA Rural Development:

The United States Department of Agriculture (USDA) administers a loan and/or grant program for small communities (population fewer than 10,000 people) to complete infrastructure improvement projects for drinking water, sanitary sewer, storm sewer, and solid waste collection. The program is administered by USDA Rural Development (RD) field offices. The field office serving the Town of St. Johnsbury is located on Summer Street in St. Johnsbury.

The program disburses funds to community projects based on a priority basis, which is determined by RD during the application process. Grant and loan eligibility criteria includes a target annual sewer rate for a typical residential household (210 GPD consumption) of 1.5% of the MHI. RD uses MHI data from the American Community Survey, which lists the Town MHI as $37,967 and the State MHI as $60,076 for 2018. The target sewer rate under the RD program is $596.50 per year, while the current annual sewer rate is approximately $660.60. If a municipality is required to increase the customer sewer rate due to the annual costs necessary to amortize the project capital above the “target sewer rate” the Town may receive grant funds for the project.

Grant funds are disbursed on a graduated scale with applicants from small communities with low median household incomes receiving a higher percentage of grant funds. Grant and loan funds are available only after a community has obtained the legal authority necessary to incur debt for construction and has been unable to obtain the needed funds from commercial sources at reasonable rates. Grants range from 25% to 75% with the RD program. Receipt of additional grant funds from other sources reduces the RD grant amount and not the loan (local share) amount.

The Town of St. Johnsbury, along with the entire Vermont Northeast Kingdom, has been designated as a Rural Economic Area Partnership (REAP) Zone. RD has defined REAP Zones as communities of geographic isolation with the absence of large metropolitan centers, low-density settlement patterns, historic dependence on agriculture, continued population loss, and economic upheaval or economic distress. The REAP Zone pilot initiative was established to address critical issues related to these constraints.

Through the REAP Zone classification, the Town of St. Johnsbury has actively worked with RD officials to fund several large infrastructure improvement projects. Although grant funding for these past projects have been very generous, it is not anticipated that this particular project will receive more than 25% grant if a grant is available.

Low interest federally subsidized loans are available through RD loan funding and vary based on household income of the community. RD does offer Vermont communities the

option to finance terms up to 30 years for wastewater projects. The three categories of loans available are as follows:

- Market Rate: 1.875% interest rate if the Median Household Income (MHI) equals or exceeds the current State non-metropolitan MHI.
- Intermediate Rate: 1.500% interest rate if the service area MHI is below the State MHI.
- Poverty Rate: 1.125% interest rate if the service area MHI is less than 80% of the State MHI and the project is needed to meet health or sanitary standards.

The Town MHI is 63% of the State MHI ratio, therefore the project may qualify for the poverty interest rate however, there must be a health and safety issue to allow for the poverty rate so the intermediate rate was used for the purposes of these estimations. Two scenarios of RD funding estimates are provided in Table 5-4. The first scenario assumes no grant allocation, and the second assumes a 25% grant allocation.

Cost Projections and Rate Effects

To evaluate sewer rate adjustments necessary to fund the recommended improvements, we have assessed future expenses including long-term debt.

We have projected the expenses for the sewer fund based on the 2019-2020 budget. The proposed capital improvements are not anticipated to result in significant additional operating and maintenance costs.

An analysis of the available funding packages was performed in relation to the 2019-2020 budget. Existing debt repayment was not considered as part of this analysis. The intent is only to show the relative increase in required revenue between the available funding opportunities. The analysis was prepared for local borrowing, CWSRF, and RD funding, as shown in Table 5-4.

TABLE 5-4
SEWER RATE AND REVENUE PROJECTIONS

	Local Borrowing at 3.875% for 30-Years	CWSRF Loan at 0% for 30-Years W/ 2% Admin and 35% Subsidy	CWSRF Loan at 0% for 30 Years W/ 2% Admin	USDA-RD Loan 1.5% for 30-Years	USDA-RD 25% Grant, 25% Loan at 1.5% for 30-Years
Estimated Total Project Cost	$352,400	$352,400	$352,400	$352,400	$352,400
Less Anticipated Grants in Aid	$0	$123,340	$0	$0	$88,100
Remaining Local Share	$352,400	$229,060	$352,400	$352,400	$264,300
Annual Payment to Capitalize Project (including principal and interest)	$20,000	$10,200	$15,700	$14,700	$11,000
Budgeted Sewer System Revenue	$1,604,350	$1,604,350	$1,604,350	$1,604,350	$1,604,350
Estimated % Increase in budget to fund project	1.2%	0.6%	1%	0.9%	0.6%

Notes:

1. Total project costs are shown in table 5-2.
2. The capital recovery factor (a/p) for 3.875% interest for 30 years is 0.051019.
3. The capital recovery factor (a/p) for 2% interest for 30 years is 0.044650.
4. The capital recovery factor (a/p) for 1.5% interest for 30 years is 0.041639.
5. Total existing revenue is based on estimated 2019-2020 budgeted revenue
6. Other capital projects are not included and the total rate increase may differ from the amount estimated for this project.

As shown, a rate increase is necessary to fund the debt costs associated with the sanitary and storm collection system improvements using any of the funding options. However, the lowest rate increase and total project cost with interest option for the Town would be to pursue CWSRF loan with subsidy.

Steps Taken to Prevent New Sources

The Town of St. Johnsbury Code of Civil Ordinances outlines the administrative operation of the wastewater collection and treatment system and provides the following provisions to control new wastewater connections:

TABLE 6-1
CODE OF CIVIL ORDINANCES

Section	Description
13-12 Objective	…the discharge of wastewaters into the public sewers which do not require or justify treatment or which will cause damage to or stoppage of the wastewater system or interfere with wastewater treatment processes are prohibited and/or rigorously controlled.
13-33 Allocations	(a) All allocations to projects shall be based on the development wastewater flow and strength. (e) Building sewer connection permit applications shall be filed in the Town Clerk's office and marked with the time and date by the person receiving the application. (f) The Board retains the right to review applications and make allocations on other than a first-come-first-serve basis if they find such action is in the Town's best interest.
13-35 Application Requirement	Persons wishing to use the Town's wastewater system shall apply to the Board on a form prescribed by the Board.

TABLE 6-1 cont'd
CODE OF CIVIL ORDINANCES

13-36 Preliminary Building Sewer Connection Approval Findings	Upon receipt of the connection application and supportive documents, the Board may make preliminary approval of uncommitted reserve capacity upon making affirmative findings that: (a) The proposed wastewater is of domestic, sanitary origin and that there is sufficient uncommitted reserve capacity to accommodate the volume and strength of the proposed connection; or (b) The proposed wastewater is not of domestic sanitary origin but that sufficient evidence has been presented by the applicant to demonstrate that the flow and strength of the wastewater is compatible with the proper operation of the wastewater systems and that the proposed wastewater will not alone or in combination with other wastes cause a violation of the discharge permit, pass through the Plant without treatment, interfere or otherwise disrupt the proper quality and disposal of Plant sludge or be injurious in any other manner to the wastewater system and that there is sufficient uncommitted reserve capacity to accommodate the flow and strength of the wastewater from the proposed development; and (c) The proposed use of wastewater reserve capacity complies with the allocation priorities and principles and is not in conflict with any other enactment adopted by the Board or Town.
13-39 Final Building Sewer Connection Approval Requirements	(a) The Board upon making affirmative findings that all conditions of the preliminary building sewer connection approval and final building sewer connection requirement in sections 13-27 and 13-28 have been fulfilled or satisfied shall issue the final connection approval permit which approval may be conditioned as follows: (1) The permit shall specify the allowed wastewater flowage and strength and any other characteristics determined appropriate by the Board. (2) The capacity allocation is not transferable to any other person or project unless approved in writing by the Board. (3) The construction of the building sewer connection and, if necessary, the municipal Sewer expansion, must be overseen and certified to be in compliance with the plans and specifications and good construction practice by a licensed plumber, Vermont Registered Professional engineer or employee of the Town authorized by the Board. (4) Capacity allocated in conjunction with the final building sewer connection permit shall revert to the Town if the permit recipient has failed to initiate construction within two years from the date the permit is issued.

TABLE 6-1 cont'd
CODE OF CIVIL ORDINANCES

13-51 Permit Required	Any person proposing a new discharge into the system or a substantial change in the volume or character of pollutants that are being discharged into the system shall obtain a written sewer connection permit from the Board at least forty-five (45) days prior to the proposed change or connection.
13-63 Storm Water Collection	No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, cellar drains, basement sumps, or other sources of surface runoff or groundwater to a building sewer which, in turn, is connected directly or indirectly to a public sanitary sewer. All such connections which exist shall be disconnected by the Owner, at his or her expense, within thirty (30) days of receipt of notification by the Board.
13-81 Unlawful Discharge to Sanitary System	No person shall discharge or cause to be discharged any storm water, surface water, ground water, roof runoff, subsurface drainage, or uncontaminated cooling water to any sanitary system.
13-93 Changes in Discharges or Connections	Any person proposing a new discharge into the sewage works or a substantial change in volume or character of pollutants that are being discharged into the sewage works shall obtain a written sewer permit and notify the Board at least forty-five (45) days prior to the proposed change or connection, and provide all laboratory analyses, technical data, engineering reports and all other information requested by the Board at their expense. No such change or connection shall be made without a written permit from the Board.

As outlined in the excerpts from the Code of Civil Ordinances above, the Town has a process for reviewing new connections to limit connections that would exceed the wastewater treatment plant capacity. Recommendations for strengthening these ordinances to limit connections in areas that contribute to combined sewer overflows is outlined below.

Recommendations

The Town's ordinances allow for the selectboard to control or limit connections to the wastewater collection system however, they could be strengthened to limit connections in areas that contribute to frequently overflowing combined sewers by adding the following language:

- Clarify the thresholds for changes in discharges or connections.

TABLE 6-2
CODE OF CIVIL ORDINANCES
SUGGESTED MODIFICATIONS

Section	Description
13-36 Preliminary Building Sewer Connection Approval Findings	Upon receipt of the connection application and supportive documents, the Board may make preliminary approval of uncommitted reserve capacity upon making affirmative findings that: (a) The proposed wastewater is of domestic, sanitary origin and that there is sufficient uncommitted reserve capacity to accommodate the volume and strength of the proposed connection; or (b) The proposed wastewater is not of domestic sanitary origin but that sufficient evidence has been presented by the applicant to demonstrate that the flow and strength of the wastewater is compatible with the proper operation of the wastewater systems and that the proposed wastewater will not alone or in combination with other wastes cause a violation of the discharge permit, pass through the Plant without treatment, interfere or otherwise disrupt the proper quality and disposal of Plant sludge or be injurious in any other manner to the wastewater system and that there is sufficient uncommitted reserve capacity to accommodate the flow and strength of the wastewater from the proposed development; and (c) The proposed use of wastewater reserve capacity complies with the allocation priorities and principles and is not in conflict with any other enactment adopted by the Board or Town. **(d) The increase in flow from the proposed wastewater connection will not increase the overflow of untreated combined sewer into surface waters.**

Appendix A

Sanitary Sewer Flows

DUFRESNE GROUP
CONSULTING ENGINEERS

Appendix A
Table 1 - CSO 006
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
1577 MAIN ST	023-002-032-000	1 FAM HOUSE 0.26A	210	VWWSR
1567 MAIN ST	023-002-033-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
578 SUMMER ST	023-002-045-000	1 FAM HOUSE GARAGE .31A	420	VWWSR
1552 MAIN ST	023-003-047-000	1 FAM HOUSE GARAGE .50A	210	VWWSR
1537 MAIN ST	023-002-036-000	1 FAM HOUSE GARAGE .33A	210	VWWSR
1538 MAIN ST	023-003-048-000	1 FAM HOUSE BARN .60A	210	VWWSR
1525 MAIN ST	023-002-037-000	1 FAM HOUSE GARAGE .75A	210	VWWSR
1520 MAIN ST	023-003-049-000	2 APT HOUSE GARAGE 4 APT HOUSE	1260	VWWSR
66 CARY PLACE	023-002-088-000	1 FAM HOUSE GARAGE .376A	210	VWWSR
1501 MAIN ST	023-002-094-000	1 FAM HOUSE GARAGE .33A	210	VWWSR
1520 MAIN ST	023-003-050-000	2 APT HOUSE GARAGE 4 APT HOUSE	1260	VWWSR
1487 MAIN ST	023-002-093-000	HOUSE GARAGE 0.29	210	VWWSR
61 CARY PLACE	023-002-087-000	1 FAM HOUSE .14A	210	VWWSR
47 CARY PLACE	023-002-091-000	1 FAM HOUSE .12A	210	VWWSR
1447 MAIN ST	023-002-090-000	1 FAM HOUSE GARAGE .90 A	210	VWWSR
1482 MAIN ST	023-003-051-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
1463 MAIN ST	023-002-092-000	HOUSE 3 APTS GARAGE 0.19	630	VWWSR
49 CLARKS AVE	023-003-052-000	HOUSE 6 APT. GARAGE .35A	1260	VWWSR
29 IDLEWOOD TER	023-003-053-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
1462 MAIN ST	023-005-002-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
1431 MAIN ST	023-002-089-000	HOUSE 6 APTS .57	1260	VWWSR
38 CLARKS AVE	023-005-003-000	1 FAM HOUSE .16A	210	VWWSR
1448 MAIN ST	023-005-001-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
71 CLARKS AVE	023-003-055-000	2 APT. HOUSE .09A	420	VWWSR
85 CLARKS AVE	023-003-056-000	2 APT HOUSE .28A	420	VWWSR
58 CLARKS AVE	023-005-004-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
1422 MAIN ST	023-005-012-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
1420 MAIN ST	023-005-011-000	1 FAM HOUSE .34A	210	VWWSR
72 CLARKS AVE	023-005-009-000	1 FAM HOUSE GARAGE 3 APT HOUSE	840	VWWSR
27 FROST AVE	023-005-013-000	1 FAM HOUSE GARAGE .37A	210	VWWSR
49 FROST AVE	023-005-023-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
27 FROST AVE	023-005-025-000	1 FAM HOUSE GARAGE .37A	210	VWWSR
1394 MAIN ST	023-005-026-000	MEDICAL OFFICE 0.18	370	Water meter data
63 FROST AVE	023-005-022-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
130 CLARKS AVE	023-005-007-000	1 FAM HOUSE .34	210	VWWSR
1396 MAIN ST	023-005-024-000	1 FAM HOUSE .15A	210	VWWSR
172 MAPLE ST	023-005-021-000	APT HOUSE 7 UNITS 0.28	1470	VWWSR
146 CLARKS AVE	023-005-006-000	HOUSE 2 APT. 0.27	420	VWWSR
152 MAPLE ST	023-005-020-000	HOUSE- 3 APTS GARAGE 0.24	630	VWWSR
1372 MAIN ST	023-005-037-000	HOUSE 6 APT UNITS 0.18	1260	VWWSR
591 RAILROAD ST	023-003-082-000	OFFICE 2 APT. GARAGE .27A	420	VWWSR
134 MAPLE ST	023-005-019-000	4 APT. HOUSE .13A	840	VWWSR
128 MAPLE ST	023-005-018-000	HOUSE 3 APTS .20 A	630	VWWSR
160 CLARKS AVE	023-005-005-000	4 APT. HOUSE .13A	840	VWWSR
181 MAPLE ST	023-005-036-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
112 MAPLE ST	023-005-016-000	1 FAM HOUSE GARAGE .06A	210	VWWSR
1360 MAIN ST	023-005-038-000	OFFICE BUILDING GARAGE 0.19	20	Water meter data
563 RAILROAD ST	023-003-083-000	10 UNIT APARTMENT BUILDING 0.36	2100	VWWSR
169 MAPLE ST	023-005-035-000	3 FAM HOUSE 0.21A	630	VWWSR
88 MAPLE ST	023-005-015-000	1 FAM HOUSE .06A	210	VWWSR
110 MAPLE ST	023-005-017-000	2 FAM HOUSE .05A	420	VWWSR
1350 MAIN ST	023-005-039-000	5 APT. DENTAL OFFICE .44A	1050	VWWSR

Appendix A
Table 1 - CSO 006
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
86 MAPLE ST	023-005-014-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
155 MAPLE ST	023-005-034-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
114 MAPLE ST	023-005-032-000	1 FAM HOUSE .10A	210	VWWSR
186 CLARKS AVE	023-005-027-000	4 APTS 2 BUILDINGS .10A	840	VWWSR
12 NORTH AVE	023-003-089-000	BLDG LAND .65	50	Water meter data
100 MAPLE ST	023-005-031-000	4 UNIT APT HOUSE 0.13	840	VWWSR
139 MAPLE ST	023-005-033-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
577 RAILROAD ST	023-003-091-000	OFFICE SPACE 4 APT .28A	840	VWWSR
1346 MAIN ST	023-005-040-000	2 APT HOUSE GARAGE .41A	420	VWWSR
82 MAPLE ST	023-005-030-000	6 APT HOUSE .16 A	1260	VWWSR
1350 MAIN ST	023-005-041-000	5 APT. DENTAL OFFICE .44A	1050	VWWSR
12 NORTH AVE	023-003-090-000	BLDG LAND .65	0	VWWSR
121 MAPLE ST	023-005-051-001	SCHOOL 1.40	315	Water meter data
72 MAPLE ST	023-005-029-000	4 UNIT APARTMENT BUILDING 0.16	1050	VWWSR
1330 MAIN ST	023-005-042-000	OFFICE BUILDING 0.26	80	Water meter data
537 RAILROAD ST	023-003-092-000	COMMERCIAL BLDG .39A	225	Water meter data
1 PLACE NOTRE DAI	023-005-051-000	BUILDING 1.75A	400	Water meter data
89 MAPLE ST	023-005-052-000	OFFICE STORAGE GARAGE 0.33	40	Water meter data
43 CHARLES ST	023-005-043-000	1 FAM HOUSE .13A	210	VWWSR
59 CHARLES ST	023-005-044-000	1 FAM HOUSE .09A	210	VWWSR
475 PEARL ST	023-005-055-000	APARTMENT BUILDING- 4 UNITS 0.19	840	VWWSR
1302 MAIN ST	023-005-045-000	BUILDING 1.11A	220	Water meter data
537 RAILROAD ST	023-003-093-000	COMMERCIAL BLDG .39A	0	VWWSR
497 RAILROAD ST	023-008-011-000	PASSUMPSIC BANK 1.07 A	0	VWWSR
17 CHURCH ST	023-004-072-000	COLONIAL 51 APT BLDG DECK .34A	10710	VWWSR
34 CHARLES ST	023-005-046-000	OFFICES .08	0	VWWSR
46 CHARLES ST	023-005-047-000	1 FAM HOUSE .07A	210	VWWSR
138 CHERRY ST	023-005-053-000	5 APT HOUSE .13A	1050	VWWSR
497 RAILROAD ST	023-008-010-000	PASSUMPSIC BANK 1.07 A	0	VWWSR
60 CHARLES ST	023-005-048-000	1 FAM HOUSE .09A	210	VWWSR
72 CHARLES ST	023-005-049-000	2 FAM HOUSE .13A	420	VWWSR
497 RAILROAD ST	023-008-009-000	PASSUMPSIC BANK 1.07 A	240	Water meter data
108 CHERRY ST	023-005-054-000	BUILDING .41	400	Water meter data
439 PEARL ST	023-005-056-000	6 APT BUILDING .16A	1260	VWWSR
1265 MAIN ST	023-004-073-000	CHURCH .32 A	110	Water meter data
73 PROSPECT ST	023-005-050-000	HOUSE .25A	210	VWWSR
1274 MAIN ST	023-005-081-000	CHURCH BUILDING .12	0	Water meter data
1249 MAIN ST	023-004-074-000	REC CENTER / ARMORY .44	0	Water meter data
30 PROSPECT ST	023-005-080-000	6 UNIT APT .12A	1260	VWWSR
438 PEARL ST	023-008-013-000	3 APT. HOUSE .07A	630	VWWSR
96 CHERRY ST	023-005-058-000	4 APT HOUSE GARAGE .18A	840	VWWSR
1262 MAIN ST	023-005-085-000	RETAIL SPACE 4 APT. .12A	840	VWWSR
425 PEARL ST	023-005-057-000	3 APT. HOUSE GARAGE .16A	630	VWWSR
1252 MAIN ST	023-005-086-000	RETAIL SPACE 6 APT. .10 A	1260	VWWSR
204 EASTERN AVE	023-005-082-000	VFW CLUBHOUSE .45 A	155	Water meter data
473 RAILROAD ST	023-008-024-000	DUNKIN DONUTS LAND ONLY .25	940	Water meter data
90 PROSPECT ST	023-005-075-000	OFFICE CONDO & .61A	300	Water meter data
68 CHERRY ST	023-005-060-000	DAY CARE CENTER .69 A	180	Water meter data
1244 MAIN ST	023-005-087-000	4 APT. RETAIL STORE .09	840	VWWSR
421 PEARL ST	023-005-059-000	1 FAM HOUSE .04A	210	VWWSR
1229 MAIN ST	023-004-075-000	OFFICE BUILDING 0.14	160	Water meter data
1236 MAIN ST	023-005-088-000	BANK 0.14	130	Water meter data

Appendix A
Table 1 - CSO 006
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
47 CHERRY ST	023-005-067-000	CHURCH .43A	20	Water meter data
457 RAILROAD ST	023-008-023-000	BLDG .14	50	Water meter data
190 EASTERN AVE	023-005-078-000	COMMERCIAL BLDG. 0.34	270	Water meter data
1230 MAIN ST	023-005-089-000	RETAIL 4 APT. BLDG. 0.11 A	840	VWWSR
178 EASTERN AVE	023-005-076-000	COMMERCIAL BLDG. 0.40	1260	VWWSR
1222 MAIN ST	023-005-090-000	RETAIL OFFICE SPACE .18	120	Water meter data
443 RAILROAD ST	023-008-021-000	BLDG .40	165	Water meter data
46 CHERRY ST	023-005-061-000	COMM CARE BLDG .72A	2890	Water meter data
218 EASTERN AVE	023-005-083-000	RETAIL/OFFICE SPACE 0.08	0	Water meter data
1216 MAIN ST	023-005-091-000	RESTAURANT 0.03	710	Water meter data
166 EASTERN AVE	023-005-074-000	COMMERCIAL BLDG. 2 APT. .10	420	VWWSR
1214 MAIN ST	023-005-092-000	TAVERN 4 APT. BLDG. 0.03A	840	VWWSR
0 EASTERN AVE	023-005-084-000	LAND ONLY .18	0	VWWSR
47 CHERRY ST	023-005-068-000	CHURCH .43A	0	VWWSR
1204 MAIN ST	023-005-093-000	RETAIL STORE 0.05	840	VWWSR
156 EASTERN AVE	023-005-073-000	1 FAM HOUSE STORE .04A	210	VWWSR
1194 MAIN ST	023-005-094-000	OFFICE 3 APT. BLDG. 0.14 A	630	VWWSR
148 EASTERN AVE	023-005-072-000	BLDG STORE .05	1890	VWWSR
429 RAILROAD ST	023-008-020-001	BLDG .14	20	Water meter data
134 EASTERN AVE	023-005-069-000	6 APT BUILDING & PARKING LOT 0.41	1260	VWWSR
142 EASTERN AVE	023-005-071-000	COMMERCIAL BLDG. 1 APT. .02	780	Permit WW-7-1582
371 PEARL ST	023-005-062-000	HOUSE 2 APT. .04A	420	VWWSR
140 EASTERN AVE	023-005-070-000	RETAIL STORE / RESIDENCE .03	50	Water meter data
1126 MAIN ST	023-007-022-000	COURT HOUSE 2.0 A	225	Water meter data
397 RAILROAD ST	023-008-018-000	RETAIL & OFFICE SPACE.298A	525	Water meter data
1126 MAIN ST	023-007-021-000	COURT HOUSE 2.0 A	0	VWWSR
415 RAILROAD ST	023-008-019-000	COMMERCIAL BLDG. .04A	35	Water meter data
1184 MAIN ST	023-005-095-000	OFFICE BUILDING 1 APT UNIT .06	210	VWWSR
359 PEARL ST	023-005-063-000	1 FAM HOUSE GARAGE .04A	210	VWWSR
18 CHERRY ST	023-005-066-000	4 APT HOUSE .33A	840	VWWSR
74 EASTERN AVE	023-005-064-000	BLDG .33	5560	Permit WW-7-5200
94 EASTERN AVE	023-005-065-000	RESTAURANT .09	190	Water meter data
115 EASTERN AVE	023-007-030-000	TEMPLE .23A	120	Water meter data
36 EASTERN AVE	023-008-041-000	LOT & BUILDING .07	110	Water meter data
48 EASTERN AVE	023-008-043-000	18 APT. BUILDING BARBER SHOP 0.1	3780	VWWSR
10 EASTERN AVE	023-008-039-000	CONDO UNIT #1 APARTMENTS 47 AP	10302	APPS + WW-7-0958
67 EASTERN AVE	023-007-033-000	OFFICE 0.19	190	Water meter data
67 EASTERN AVE	023-007-034-000	OFFICE BUILDING 0.19	2080	Water meter data
51 DEPOT SQUARE	023-008-035-001	COMMERCIAL BLDG .79 A	225	Water meter data
51 DEPOT SQUARE	023-008-051-000	COMMERCIAL BLDG .79 A	225	Water meter data
Total Contributing Average Daily Flow			**96397**	**GPD**

Appendix A
Table 2 - CSO 007
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
129 ELM ST	024-001-044-000	HOUSE 5 APTS 0.25	1050	VWWSR
109 ELM ST	024-001-045-000	HOUSE 4 APTS GARAGE 0.36	840	VWWSR
20 COTE CT	024-001-049-000	HOUSE 3 APTS. 0.37	630	VWWSR
87 ELM ST	024-001-046-000	1 FAM HOUSE 0.17	210	VWWSR
71 ELM ST	024-001-047-000	HOUSE- 5 APTS 0.41	1050	VWWSR
59 COTE CT	024-001-050-000	HOUSE 3 APT. GARAGE 0.32	630	VWWSR
53 ELM ST	024-001-048-000	HOUSE 5 APT 0.39	1050	VWWSR
73 COTE CT	024-001-051-000	HOUSE 3 APTS. GARAGE 0.21	630	VWWSR
287 PORTLAND ST	024-001-077-000	COMMERCIAL BUILDING 2 APT. .31A	1920	VWWSR RES. + SEAT, 2 MEAL RESTAURANT
271 PORTLAND ST	024-001-076-000	OFFICE 1 APT .23A	210	VWWSR
261 PORTLAND ST	024-001-075-000	HOUSE 2 APT GARAGE .17A	420	VWWSR
54 WEEKS CT	024-001-073-000	1 FAM HOUSE GARAGE .07A	210	VWWSR
251 PORTLAND ST	024-001-074-000	COMM BLDG 1 APT .07A	210	VWWSR
229 PORTLAND ST	024-001-072-000	VET OFFICE RETAIL 0.32	0	VWWSR
229 PORTLAND ST	024-001-071-000	VET OFFICE RETAIL 0.32	1500	VWWSR
138 WEEKS CT	024-001-069-000	REPAIR SHOP .05A	75	VWWSR 15 PER PERSON (5 WORKERS)
8 BAY ST	024-001-068-000	STORAGE GARAGE 0.04	0	VWWSR
10 BAY ST	024-001-067-000	WELDING SHOP .17	75	VWWSR 15 PER PERSON (5 WORKERS)
264 PORTLAND ST	024-004-003-000	RESTAURANT 0.53A	1200	VWWSR 30 PER PERSON (40 PEOPLE)
264 PORTLAND ST	024-003-009-000	RESTAURANT 0.53A	0	VWWSR
230 PORTLAND ST	024-003-007-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
28 BAY ST	024-001-066-000	HOUSE 3 APTS 0.11	630	VWWSR
22 WASHINGTON AVE	024-003-005-000	HOUSE 5 APARTMENT UNITS 0.26	1050	VWWSR
29 CALEDONIA ST	024-004-002-000	2 APT. HOUSE .10A	420	VWWSR
264 PORTLAND ST	024-003-010-000	RESTAURANT 0.53A	0	Torn Down
39 CALEDONIA ST	024-004-001-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
35 WASHINGTON AVE	024-003-008-000	HOUSE- 4 APARTMENT UNITS 0.11	840	VWWSR
42 WASHINGTON AVE	024-003-006-000	3 APT. HOUSE .19A	630	VWWSR
48 CALEDONIA ST	024-003-011-000	1 FAM HOUSE GARAGE .16A	210	VWWSR
53 CALEDONIA ST	024-004-028-000	3 APT. HOUSE .19A	630	VWWSR
71 CALEDONIA ST	024-004-029-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
42 LAFAYETTE ST	024-004-040-000	1 FAM HOUSE DECK .18A	210	VWWSR
93 CALEDONIA ST	024-004-030-000	2 APT HOUSE GARAGE .26A	420	VWWSR
61 JAMES ST	024-004-039-000	1 FAM HOUSE .20A	210	VWWSR
45 JAMES ST	024-004-038-000	1 FAM HOUSE .31A	210	VWWSR
27 JAMES ST	024-004-037-000	1 FAM HOUSE .15A	210	VWWSR
101 CALEDONIA ST	024-004-031-000	1 FAM HOUSE .07A	210	VWWSR
102 CALEDONIA ST	024-003-015-000	1 FAM HOUSE GARAGE .10A	210	VWWSR
109 CALEDONIA ST	024-004-032-000	2 APT. HOUSE .07A	420	VWWSR
112 CALEDONIA ST	024-003-016-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
60 JAMES ST	024-004-036-000	1 FAM HOUSE .34A	210	VWWSR
45 JAMES ST	024-004-035-000	1 FAM HOUSE .31A	210	VWWSR
26 JAMES ST	024-004-034-000	1 FAM HOUSE 0.25A	210	VWWSR
121 CALEDONIA ST	024-004-033-000	1 FAM HOUSE .09A	210	VWWSR
124 CALEDONIA ST	024-003-017-000	1 FAM HOUSE .23A	210	VWWSR
131 CALEDONIA ST	024-004-045-000	1 FAM HOUSE .07A	210	VWWSR
143 CALEDONIA ST	024-004-046-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
144 CALEDONIA ST	024-003-039-000	3 APT. HOUSE .21A	630	VWWSR
157 CALEDONIA ST	024-004-047-000	2 APT. HOUSE .32A	420	VWWSR
156 CALEDONIA ST	024-003-040-000	1 FAM HOUSE .18A	210	VWWSR
Total Contributing Average Daily Flow			**21990**	**GPD**

Appendix A
Table 3 - CSO 008
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
462 RAILROAD ST	023-008-025-000	COMM BLDG STORES 8 APT .17 A	2980	METERING INFO
202 BAY ST	024-003-027-000	LOT & MILL .99 A	150	VWWSR 15 PER PERSON (10 WORKERS)
452 RAILROAD ST	023-008-027-000	KINGDOM OUTDOORS BLDG .17	320	METERING INFO
438 RAILROAD ST	023-008-028-000	BLDG .16	530	METERING INFO
430 RAILROAD ST	023-008-029-000	COMMERCIAL BLDG .21 A	280	METERING INFO
418 RAILROAD ST	023-008-030-000	COMMERCIAL BLDG & APTS .16A	220	METERING INFO
195 BAY ST	024-003-034-000	OFFICE EQUIPMENT SUPPLY BUILDING. 21	150	VWWSR 15 PER PERSON (10 WORKERS)
394 RAILROAD ST	023-008-032-000	COND UNIT 1 APT BUILDING .19 A	1150	METERING INFO
378 RAILROAD ST	023-008-033-000	BLDG .19	19940	METERING INFO
249 BAY ST	024-003-032-000	MAIN STORAGE BUILDING .71	150	VWWSR 15 PER PERSON (10 WORKERS)
370 RAILROAD ST	023-008-034-000	BLDG .12	150	VWWSR 15 PER PERSON (10 WORKERS)
364 RAILROAD ST	023-008-036-000	BLDG .16	210	METERING INFO
Total Contributing Average Daily Flow			**26230**	**GPD**

Appendix A
Table 4 - CSO 009
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
215 NORTH AVE	023-003-041-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
200 NORTH AVE	023-003-039-000	1 FAM HOUSE GARAGE .53A	210	VWWSR
211 NORTH AVE	023-003-040-000	1 FAM HOUSE GARAGE .70A	210	VWWSR
136 BAGLEY ST	023-003-071-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
186 NORTH AVE	023-003-066-000	1 FAM HOUSE .20A	210	VWWSR
163 NORTH AVE	023-003-058-000	1 FAM HOUSE .42A	210	VWWSR
108 BAGLEY ST	023-003-070-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
34 IDLEWOOD TER	023-003-057-000	1 FAM HOUSE GARAGE .36A	210	VWWSR
172 NORTH AVE	023-003-065-000	HOUSE 2 APT. .13A	420	VWWSR
88 BAGLEY ST	023-003-069-000	5 APT. HOUSE 0.29	1050	VWWSR
135 NORTH AVE	023-003-059-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
134 NORTH AVE	023-003-064-000	BLDG 5 APT .16A	1050	VWWSR
125 NORTH AVE	023-003-060-000	3 APT. HOUSE SHED .35A	630	VWWSR
60 BAGLEY ST	023-003-068-000	4 APT. HOUSE GARAGE .26A	840	VWWSR
122 NORTH AVE	023-003-063-000	3 APT HOUSE GARAGE .23A	630	VWWSR
109 NORTH AVE	023-003-061-000	1 FAM HOUSE .18A	210	VWWSR
95 NORTH AVE	023-003-085-000	HOUSE 2 APT. .17A	420	VWWSR
639 RAILROAD ST	023-003-079-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
98 NORTH AVE	023-003-062-000	6 APT. HOUSE .16A	1260	VWWSR
30 BAGLEY ST	023-003-067-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
145 CLARKS AVE	023-003-087-000	2 APT HOUSE 0.53	420	VWWSR
24 BAGLEY ST	023-003-080-000	LOW RISE MULTIPLE 0.17	420	VWWSR
85 NORTH AVE	023-003-086-000	2 FAM HOUSE .31A	420	VWWSR
56 NORTH AVE	023-003-084-000	HOUSE 6 APT. 70A	1260	VWWSR
622 RAILROAD ST	024-001-059-000	HOUSE, GARAGE .38A	420	VWWSR
605 RAILROAD ST	023-003-081-000	HOUSE 5 APT .44	1050	VWWSR
157 CLARKS AVE	023-003-088-000	2 FAM HOUSE .14A	420	VWWSR
594 RAILROAD ST	023-008-001-000	HOUSE 2 APT. OFFICE .18A	420	VWWSR
590 RAILROAD ST	023-008-002-000	4 APT HOUSE .15A	840	VWWSR
590 RAILROAD ST	024-001-061-000	4 APT HOUSE .15A	840	VWWSR
576 RAILROAD ST	023-008-003-000	BLDG .22	65	Water meter data
560 RAILROAD ST	023-008-004-000	BUILDING .31	400	Water meter data
80 ST MARY ST	024-001-065-000	2 APT HOUSE .27A	210	VWWSR
542 RAILROAD ST	023-008-005-000	HOUSE 2 APT. OFFICE .22A	420	VWWSR
50 ST MARY ST	024-001-064-000	OFFICE GARAGE 1.0	150	VWWSR 15 PER PERSON (10 WORKERS)
0 RAILROAD ST	023-008-006-000	BROOKS PARKING LOT .2A	0	VWWSR
502 RAILROAD ST	023-008-007-000	COMMERCIAL BLDG. .54A	225	METERING INFO
10 ST MARY ST	024-001-063-000	WAREHOUSE WITH STOREFRONT 0.24 A	150	VWWSR 15 PER PERSON (10 WORKERS)
12 ST MARY ST	024-001-062-000	OFFICE 2 APTS .07A	420	VWWSR
0 BAY ST	024-003-023-000	COMMERCIAL LAND .34	0	VWWSR
490 RAILROAD ST	023-008-008-000	BLDG .23	150	VWWSR 15 PER PERSON (10 WORKERS)
136 BAY ST	024-003-026-000	WAREHOUSE OFFICE 0.52	150	VWWSR 15 PER PERSON (10 WORKERS)
119 BAY ST	024-003-024-000	SERVICE GARAGE WAREHOUSE 0.32	150	VWWSR 15 PER PERSON (10 WORKERS)
Total Contributing Average Daily Flow			**17820**	**GPD**

Appendix A
Table 5 - CSO 010
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
206 ST MARY ST	024-001-039-000	3 APT HOUSE GARAGE .66A	630	VWWSR
185 ST MARY ST	024-001-035-000	4 APT. HOUSE .28A	840	VWWSR
186 ST MARY ST	024-001-040-000	1 FAM HOUSE .24A	210	VWWSR
169 ST MARY ST	024-001-036-000	1 FAM HOUSE .35A	210	VWWSR
172 ST MARY ST	024-001-053-000	4 APT. HOUSE GARAGE .22A	840	VWWSR
160 ST MARY ST	024-001-054-000	HOUSE 2 APT. GARAGE .29A	420	VWWSR
146 ST MARY ST	024-001-055-000	3 APT. HOUSE GARAGE .21A	630	VWWSR
134 ST MARY ST	024-001-056-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
120 ST MARY ST	024-001-057-000	HOUSE 2 APT. GARAGE .68A	420	VWWSR
Total Contributing Average Daily Flow			**4410**	**GPD**

Appendix A
Table 6 - CSO 010A
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
51 PERKINS ST	024-001-008-000	WAREHOUSE, GARAGE,SHED 6.2 A	780	Water meter info
802 RAILROAD ST	024-001-001-000	BLDG .25	50	Water meter info
49 PERKINS ST	024-001-020-000	WAREHOUSE .83 A	0	Water meter info
799 RAILROAD ST	023-003-031-000	4 APT. HOUSE .20A	840	VWWSR
784 RAILROAD ST	024-001-027-000	RETAIL STORE GARAGE APT .08 A	210	VWWSR
789 RAILROAD ST	023-003-032-000	HOUSE 2 APT. .26 A	420	VWWSR
12 PERKINS ST	024-001-019-000	RETAIL APARTMENTS WAREHOUSE 0.31	840	VWWSR
54 HOOKER HILL RD	024-001-018-000	1 FAM HOUSE .15A	210	VWWSR
42 HOOKER HILL RD	024-001-017-000	1 FAM HOUSE .14A	210	VWWSR
20 HOOKER HILL RD	024-001-016-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
770 RAILROAD ST	024-001-028-000	OFFICE MEDICAL .21 A	65	Water meter info
767 RAILROAD ST	023-003-033-000	LAND ONLY .19 A	0	VWWSR
73 HOOKER HILL RD	024-001-022-000	HOUSE 2 APT .21AC	420	VWWSR
759 RAILROAD ST	023-003-034-000	1 FAM HOUSE .19A	210	VWWSR
11 HOOKER HILL RD	024-001-021-000	HOUSE- 4 APARTMENT UNITS 0.37	840	VWWSR
755 RAILROAD ST	023-003-036-000	HOUSE 2 APT. GARAGE .32 A	420	VWWSR
716 RAILROAD ST	024-001-029-000	ABSOLUTE TRANSITIONS / FAMILY DOLLAR BLDG .8	20	Water meter info
755 RAILROAD ST	023-003-035-000	HOUSE 2 APT. GARAGE .32 A	420	VWWSR
97 HOOKER HILL RD	024-001-026-000	HOUSE 2 APT. GARAGE .28A	420	VWWSR
137 HOOKER HILL RD	024-001-025-000	2 APT HOUSE GARAGE .486A	420	VWWSR
739 RAILROAD ST	023-003-037-000	3 APT HOUSE GARAGE .3 A	630	VWWSR
138 HOOKER HILL RD	024-001-041-002	1 FAM HOUSE BARN .44A	210	VWWSR
151 HOOKER HILL RD	024-001-024-000	1 FAM HOUSE GARAGE .29 A	420	VWWSR
725 RAILROAD ST	023-003-072-000	HOUSE 2 APT. GARAGE .21	420	VWWSR
236 ST MARY ST	024-001-031-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
166 HOOKER HILL RD	024-001-043-000	1 FAM HOUSE .15A	210	VWWSR
713 RAILROAD ST	023-003-073-000	HOUSE 2 APT. GARAGE .21A	420	VWWSR
150 HOOKER HILL RD	024-001-041-001	1 FAM HOUSE GARAGE .36A	210	VWWSR
242 ST MARY ST	024-001-032-000	HOUSE GARAGE 0.16 A	210	VWWSR
232 ST MARY ST	024-001-037-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
701 RAILROAD ST	023-003-074-000	HOUSE 2 APT. GARAGE .21A	420	VWWSR
156 HOOKER HILL RD	024-001-042-000	HOUSE GARAGE .47A	210	VWWSR
212 ST MARY ST	024-001-038-000	1 FAM HOUSE GARAGE .31A	210	VWWSR
683 RAILROAD ST	023-003-075-000	HOUSE 2 APT. OFFICE .20A	420	VWWSR
233 ST MARY ST	024-001-033-000	3 APT. HOUSE GARAGE .17A	630	VWWSR
673 RAILROAD ST	023-003-076-000	HOUSE 3 APT .2 A	630	VWWSR
215 ST MARY ST	024-001-034-000	HOUSE 3 APTS GARAGE .16	630	VWWSR
663 RAILROAD ST	023-003-077-000	HOUSE APT GARAGE .19	1050	VWWSR
651 RAILROAD ST	023-003-078-000	HOUSE 2 APT. GARAGE .23A	420	VWWSR
652 RAILROAD ST	024-001-058-000	CONVENIENCE MARKET 0.49	170	Water meter info
Total Contributing Average Daily Flow			**14945**	**GPD**

Appendix A
Table 7 - CSO 011
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
2523 PORTLAND ST	011-001-067-000	AUTO SHOW ROOM 5.51	165	Water meter info
159 MOOSE RIVER DR	011-001-053-000	28 UNITS 11.1 A	3365	METERING INFO
2225 PORTLAND ST	011-001-071-002	OFFICE BUILDING 7.66 A	370	Water meter info
131 SPAULDING RD	011-001-055-000	1 FAM HOUSE .26A	210	VWWSR
113 SPAULDING RD	011-001-054-000	1 FAM HOUSE GARAGE .26	210	VWWSR
2483 PORTLAND ST	011-001-068-000	BLDG 1.37	50	Water meter info
2285 PORTLAND ST	011-001-070-000	HOUSE 2.16	210	VWWSR
2265 PORTLAND ST	011-001-071-001	LAND ONLY 3.12A	0	VWWSR
2388 PORTLAND ST	011-002-011-000	LODGE 2.60	225	Water meter info
72 MOOSE RIVER DR	011-001-074-000	HOUSE 0.21	210	VWWSR
2176 PORTLAND ST	011-002-013-000	LAND AND BUILDINGS 27 A	1045	Water meter info
2165 PORTLAND ST	011-001-072-000	BLDG 1.23A	305	Water meter info
2165 PORTLAND ST	011-001-075-000	BLDG 1.23A	0	VWWSR
51 DUKE ST	027-001-024-000	1 FAM HOUSE 17.25A	210	VWWSR
217 ALMSHOUSE RD	024-002-012-000	TOWN GARAGE 12.3	60	Water meter info
217 CONCORD AVE	024-002-005-000	1 FAM HOUSE .31A	210	VWWSR
231 CONCORD AVE	024-002-006-000	HOUSE 2 APT. GARAGE .29 A	420	VWWSR
159 DUKE ST	027-001-006-000	D W MOBILE HOME 1.00	210	VWWSR
375 CONCORD AVE	024-002-021-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
391 CONCORD AVE	024-002-020-000	1 FAM HOUSE GARAGE .36A	210	VWWSR
411 CONCORD AVE	024-002-019-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
427 CONCORD AVE	024-002-018-000	1 FAM HOUSE .52A	210	VWWSR
220 ELM ST	024-002-022-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
427 CONCORD AVE	024-002-045-000	1 FAM HOUSE .52A	210	VWWSR
447 CONCORD AVE	024-002-017-000	1 FAM HOUSE GARAGE .36	210	VWWSR
143 DUKE ST	027-001-007-000	HOUSE GARAGE 0.55	210	VWWSR
206 ELM ST	024-002-023-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
35 COTTAGE ST	024-002-048-000	HOUSE GARAGE .72	210	VWWSR
14 HARRISON AVE	024-002-040-000	1 FAM HOUSE GARAGE 2.30A	210	VWWSR
1595 PORTLAND ST	011-001-082-002	MODULAR HOME 5.01 A	210	VWWSR
36 COTTAGE ST	024-002-051-000	HOUSE .15	210	VWWSR
81 ASSISQUA AVE	027-001-016-000	3 APT. HOUSE GARAGE .43A	630	VWWSR
521 CONCORD AVE	024-002-052-000	HOUSE 3 APT. GARAGE .73 A	630	VWWSR
575 CONCORD AVE	024-002-054-001	BLDGS 8.49 A	0	Water meter info
196 ELM ST	024-002-024-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
469 CONCORD AVE	024-002-046-000	HOUSE 3 APT. GARAGE 0.35	630	VWWSR
184 ELM ST	024-002-025-000	HOUSE 2 APT. GARAGE .13 A	420	VWWSR
809 PORTLAND ST	027-001-014-000	OFFICE BUILDING SERVICE GARAGE 2.59	11075	Water meter info
51 DUKE ST	027-001-025-000	1 FAM HOUSE 17.25A	210	VWWSR
172 ELM ST	024-002-026-000	HOUSE 2 APTS GARAGE 0.16	420	VWWSR
11 COTTAGE ST	024-002-047-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
115 DUKE ST	027-001-026-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
34 COTTAGE ST	024-002-050-000	HOUSE GARAGE 0.11	210	VWWSR
23 DROUIN ST	024-002-027-000	3 UNIT APT HOUSE 0.16	630	VWWSR
809 PORTLAND ST	027-001-013-000	OFFICE BUILDING SERVICE GARAGE 2.59	0	VWWSR
45 DUKE ST	027-001-023-000	HOUSE GARAGE 0.17	210	VWWSR
16 COTTAGE ST	024-002-049-000	2 APT. HOUSE GARAGE 0.19	420	VWWSR
54 ASSISQUA AVE	027-001-018-000	1 FAM HOUSE .06A	210	VWWSR
64 STATE ST	027-001-010-000	SERVICE GARAGE WAREHOUSE 1.30	0	Water meter info
1161 PORTLAND ST	027-001-035-000	OFFICE BUILDING 10.8 AREA AGENCY ON AGIN(	750	(WW-7-0107:15 GPD for 50 People)
42 ASSISQUA AVE	027-001-019-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
62 DUKE ST	027-001-028-000	1 FAM HOUSE 0.20	210	VWWSR
41 DROUIN ST	024-002-036-000	HOUSE 2 APT 0.17	420	VWWSR
80 DUKE ST	027-001-029-000	HOUSE GARAGE .25A	210	VWWSR
1161 PORTLAND ST	011-001-080-000	OFFICE BUILDING 10.8 AREA AGENCY ON AGIN(	0	VWWSR
96 DUKE ST	027-001-030-000	HOUSE GARAGE 0.52	210	VWWSR
482 CONCORD AVE	024-002-043-000	4 APTS. GARAGE 0.24	840	VWWSR
114 HARRISON AVE	024-002-037-000	1 FAM HOUSE .13A	210	VWWSR
31 DUKE ST	027-001-022-000	HOUSE GARAGE 0.18	210	VWWSR
112 HARRISON AVE	024-002-034-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
100 HARRISON AVE	024-002-033-000	HOUSE GARAGE .30 A	210	VWWSR
60 HARRISON AVE	024-002-039-000	2 FAM HOUSE GARAGE 0.20	420	VWWSR
909 PORTLAND ST	027-001-017-000	BLDG .30	10	Water meter info
120 ELM ST	024-002-029-000	HOUSE 3 APT GARAGE 0.27	630	VWWSR
1033 PORTLAND ST	027-001-036-000	1 FAM HOUSE GARAGE 1.08A	210	VWWSR
29 HARRISON AVE	024-002-042-000	HOUSE 2 APT.GARAGE .21 A	420	VWWSR
10 DUKE ST	027-001-027-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
535 CONCORD AVE	024-002-053-000	1 FAM HOUSE .16A	210	VWWSR
78 HARRISON AVE	024-002-038-000	HOUSE 5 APTS GARAGE 0.31	1050	VWWSR
504 CONCORD AVE	024-002-044-000	1 FAM HOUSE .20A	210	VWWSR
935 PORTLAND ST	027-001-020-000	WAREHOUSE .41	0	Water meter info
955 PORTLAND ST	027-001-021-000	HOUSE- 2 APARTMENTS GARAGE 0.20 A	420	VWWSR
40 STATE ST	027-001-011-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
41 HARRISON AVE	024-002-041-000	1 FAM HOUSE 0.18	210	VWWSR
991 PORTLAND ST	027-001-037-000	HOUSE- 2 APARTMENTS 0.24A	420	VWWSR
879 PORTLAND ST	027-001-015-000	1 FAM HOUSE .18A	210	VWWSR
27 WEST COTTAGE ST	024-002-063-000	1 FAM HOUSE .23A	210	VWWSR
564 CONCORD AVE	024-002-062-000	AD ROSSI BLDG .72	105	Water meter info
108 ELM ST	024-002-030-000	1 FAM HOUSE .25A	210	VWWSR
116 HARRISON AVE	024-002-032-000	HOUSE 2 APT. GARAGE .32 A	420	VWWSR
58 ELY ST	027-001-009-000	HOUSE- 3 APTS 0.26	630	VWWSR
57 HARRISON AVE	024-002-066-000	HOUSE 3 APTS 0.37	630	VWWSR

Appendix A
Table 7 - CSO 011
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
37 WEST COTTAGE ST	024-002-064-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
79 HARRISON AVE	024-002-067-000	2 FAM HOUSE GARAGE 0.36	420	VWWSR
88 ELM ST	024-002-031-000	HOUSE 3 APTS GARAGES 0.28	630	VWWSR
79 HARRISON AVE	024-002-068-000	2 FAM HOUSE GARAGE 0.36	420	VWWSR
53 WEST COTTAGE ST	024-002-065-000	3 APT HOUSE GARAGE .17A	630	VWWSR
809 PORTLAND ST	027-001-038-000	OFFICE BUILDING SERVICE GARAGE 2.59	0	VWWSR
87 HARRISON AVE	024-002-069-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
757 PORTLAND ST	027-001-039-000	SERVICE STATION MINI MART 0.15	0	Water meter info
852 PORTLAND ST	027-002-008-000	WAREHOUSE 3.70 A. LOT,BLD	305	Water meter info
103 HARRISON AVE	024-002-070-000	HOUSE 2 APTS GARAGE 0.47	420	VWWSR
976 PORTLAND ST	027-002-005-000	1 FAM HOUSE .04A	210	VWWSR
986 PORTLAND ST	027-002-004-000	1 FAM HOUSE .09A	210	VWWSR
709 PORTLAND ST	027-001-041-000	AUTO SHOWROOM & SVC GARAGE .3A	160	Water meter info
1052 PORTLAND ST	027-002-003-000	FACTORY OFFICE SHED 1.40A	8865	Water meter info
121 HARRISON AVE	024-002-071-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
68 ELM ST	024-002-072-001	HOUSE - 4 APARTMENTS 0.25	840	VWWSR
667 PORTLAND ST	024-002-055-000	BLDG .25	0	Water meter info
780 PORTLAND ST	027-002-010-000	2 APT HOUSE .27A	420	VWWSR
0 PORTLAND ST	024-002-056-000	PARKING LOT .23	0	VWWSR
619 PORTLAND ST	024-002-057-000	HOUSE 2 APT. GARAGE .20A	420	VWWSR
599 PORTLAND ST	024-002-058-000	SERVICE STATION 0.37	50	Water meter info
19 LINCOLN ST	027-002-011-000	2 FAM HOUSE GARAGE 0.25	420	VWWSR
623 CONCORD AVE	024-002-060-000	4 APT. BUILDING RETAIL SPACE .16 A	840	VWWSR
744 PORTLAND ST	027-001-042-000	COMM BLDG .36	35	Water meter info
924 PORTLAND ST	027-002-002-000	MFG & WAREHOUSE BLDGS. 2.9A	0	VWWSR
0 PORTLAND ST	024-002-061-000	LAND ONLY .44	0	VWWSR
58 ELM ST	024-002-072-002	HOUSE 4 APTS GARAGE 0.22	840	VWWSR
501 PORTLAND ST	024-002-073-000	1 APT OFFICE .28A	210	VWWSR
714 PORTLAND ST	027-001-043-001	BLDG .91	20	Water meter info
459 PORTLAND ST	024-002-076-000	OFFICE RETAIL .32	600	VWWSR 15 PER PERSON (40 WORKERS)
425 PORTLAND ST	024-002-077-000	MEDICAL OFFICE GARAGES .56 A	1110	VWWSR 35 PER STAFF, 10 PER PATIENT (6 AND 90)
385 PORTLAND ST	024-002-078-000	BLDG 1.68	1875	Permit WW-7-0401
684 PORTLAND ST	027-001-044-000	BLDG 1.3	310	Water meter info
29 LINCOLN ST	027-002-012-000	1 FAM HOUSE .11A	210	VWWSR
577 LAFAYETTE ST	027-002-014-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
565 LAFAYETTE ST	027-002-016-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
589 LAFAYETTE ST	027-002-013-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
481 PORTLAND ST	024-002-074-000	BANK .63	150	15 PER PERSON (10 WORKERS)
545 LAFAYETTE ST	027-002-017-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
642 PORTLAND ST	024-005-001-000	BLDG .57	1870	Water meter info
347 PORTLAND ST	024-002-079-000	OFFICE BLDG 0.42	300	VWWSR 15 PER PERSON (20 WORKERS)
41 LINCOLN ST	027-002-018-000	1 FAM HOUSE .25A	210	VWWSR
604 PORTLAND ST	024-005-002-000	CONVENIENCE STORE FUEL .18A	840	Water meter info
485 LAFAYETTE ST	027-001-046-000	HOUSE-2 APT. 0.46	420	VWWSR
325 PORTLAND ST	024-002-080-000	BANK .39A	150	VWWSR 15 PER PERSON (10 WORKERS)
561 LAFAYETTE ST	027-002-015-000	1 FAM HOUSE .07A	210	VWWSR
309 PORTLAND ST	024-002-082-000	OFFICE 2 APT BUILDING 0.38A	420	VWWSR
580 PORTLAND ST	024-005-003-000	BLDG 1.096A	120	VWWSR 30 PER PERSON (20 PEOPLE)
714 PORTLAND ST	027-001-043-002	BLDG .91	0	VWWSR
532 PORTLAND ST	024-005-007-000	CORNERSTONE SCHOOL 1.41 A	900	VWWSR 20 PER PERSON (35 STUDENTS, 10 STAFF)
115 LINCOLN ST	027-002-024-000	SCHOOL BLDG 11.15A	470	Water meter info
465 LAFAYETTE ST	027-001-045-000	HOUSE 2 APT. 0.17 A	420	VWWSR
723 CONCORD AVE	024-005-011-000	OFFICE BUILDING 0.33	80	Water meter info
506 PORTLAND ST	024-005-004-000	HOUSE - 3 APARTMENTS 0.22	630	VWWSR
490 PORTLAND ST	024-005-005-000	RETAIL 3 APT. BLDG .25 A	630	VWWSR
584 LAFAYETTE ST	027-002-023-000	HOUSE 2 APT. GARAGE 0.60	420	VWWSR
472 PORTLAND ST	024-004-018-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
550 LAFAYETTE ST	027-002-021-000	1 FAM HOUSE GARAGE .48A	210	VWWSR
450 PORTLAND ST	024-004-016-000	HOUSE- 3 APARTMENTS 0.22	630	VWWSR
530 LAFAYETTE ST	027-002-019-000	1 FAM HOUSE 0.40	210	VWWSR
442 PORTLAND ST	024-004-015-000	RETAIL BLDG .05 LOT20X100	75	VWWSR 15 PER PERSON (5 WORKERS)
514 LAFAYETTE ST	027-001-052-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
390 PORTLAND ST	024-004-014-000	LOW RISE MULTIPLE 8 UNITS 0.35	2100	VWWSR
363 LAFAYETTE ST	024-005-009-000	HOUSE 2 APT. GARAGE 0.30	420	VWWSR
468 LAFAYETTE ST	027-001-051-000	HOUSE 3 APT GARAGE 0.61	630	VWWSR
380 PORTLAND ST	024-004-013-000	LAND ONLY .18 A	0	VWWSR
372 PORTLAND ST	024-004-012-000	1 FAM HOUSE RETAIL STORE .22A	210	VWWSR
372 PORTLAND ST	024-004-011-000	1 FAM HOUSE RETAIL STORE .22A	210	VWWSR
342 PORTLAND ST	024-004-010-000	YANKEE TRAVELER MOTEL 1.93	0	VWWSR
347 LAFAYETTE ST	024-005-008-000	1 FAM HOUSE GARAGE .10A	210	VWWSR
243 LAFAYETTE ST	024-005-006-000	HOUSE 3 APTS GARAGE 0.72	630	VWWSR
767 CONCORD AVE	027-001-047-000	3 APT HOUSE GARAGE .30 A	630	VWWSR
223 LAFAYETTE ST	024-004-019-000	3 APTS 0.28	630	VWWSR
0 PORTLAND ST	024-004-009-000	LAND ONLY 0.23	0	VWWSR
787 CONCORD AVE	027-001-048-000	HOUSE 2 APT. GARAGE 0.43	420	VWWSR
93 LINCOLN ST	027-002-020-000	1 FAM HOUSE .15A	210	VWWSR
292 PORTLAND ST	024-004-005-000	COMMERCIAL BLDG. 0.12	600	Permit WW-7-0624
201 LAFAYETTE ST	024-004-020-000	1 FAM HOUSE GARAGE .39A	210	VWWSR
14 MOUNTAIN AVE	024-005-025-000	HOUSE 2 APT GARAGE 0.25	420	VWWSR
390 LAFAYETTE ST	024-005-024-000	HOUSE 2 APT 0.23	420	VWWSR
280 PORTLAND ST	024-004-004-000	BLDG .32	1000	500 PER PUMP (2 PUMPS)
376 LAFAYETTE ST	024-005-023-000	HOUSE 3 APTS 0.58	630	VWWSR

Appendix A
Table 7 - CSO 011
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
354 LAFAYETTE ST	024-005-022-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
94 LINCOLN ST	027-001-053-000	HOUSE 2 APTS 0.37	420	VWWSR
342 LAFAYETTE ST	024-005-021-000	1 FAM HOUSE GARAGE .82A	210	VWWSR
799 CONCORD AVE	027-001-049-000	1 FAM HOUSE GARAGE .38A	210	VWWSR
320 LAFAYETTE ST	024-005-019-000	1 FAM HOUSE GARAGE .43A	210	VWWSR
179 LAFAYETTE ST	024-004-021-000	HOUSE 2 APT .28 A	420	VWWSR
298 LAFAYETTE ST	024-005-017-000	1 FAM HOUSE .53A	210	VWWSR
760 CONCORD AVE	027-003-001-000	HOUSE 2 APT. GARAGE 0.23	420	VWWSR
25 WRIGHT AVE	024-004-006-000	1 FAM HOUSE .06A	210	VWWSR
280 LAFAYETTE ST	024-005-015-000	1 FAM HOUSE GARAGE .53A	210	VWWSR
133 LAFAYETTE ST	024-004-022-000	1 FAM HOUSE GARAGE .55A	210	VWWSR
30 MOUNTAIN AVE	024-005-026-000	MOBILE HOME GARAGE 0.25	210	VWWSR
268 LAFAYETTE ST	024-005-013-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
108 LINCOLN ST	027-001-054-000	1 FAM HOUSE .10A	210	VWWSR
243 LAFAYETTE ST	024-005-012-000	HOUSE 3 APTS GARAGE 0.72	630	VWWSR
19 LIBERTY ST	027-001-050-000	1 FAM HOUSE .49A	210	VWWSR
31 WRIGHT AVE	024-004-007-000	1 FAM HOUSE .14A	210	VWWSR
228 LAFAYETTE ST	024-004-023-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
1023 CONCORD AVE	027-002-034-000	2 APT HOUSE GARAGE 10.70A	420	VWWSR
130 LAFAYETTE ST	024-004-024-000	1 FAM HOUSE .79A	210	VWWSR
782 CONCORD AVE	027-003-002-001	1 FAM HOUSE .20A	210	VWWSR
33 LIBERTY ST	027-001-055-000	1 FAM HOUSE .12A	210	VWWSR
47 WRIGHT AVE	024-004-008-000	APARTMENT HOUSE- 4 UNITS 0.52	840	VWWSR
320 LAFAYETTE ST	024-005-020-000	1 FAM HOUSE GARAGE .43A	210	VWWSR
1303 CONCORD AVE	027-002-027-000	OFFICE BUILDING BROADCAST STUDIO 4.39 A	30	Water meter info
48 MOUNTAIN AVE	024-005-027-000	1 FAM HOUSE GARAGE (MODULAR) .25A	210	VWWSR
804 CONCORD AVE	027-003-002-002	1 FAM HOUSE GARAGE .20A	210	VWWSR
298 LAFAYETTE ST	024-005-018-000	1 FAM HOUSE .53A	210	VWWSR
35 MOUNTAIN AVE	024-005-028-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
280 LAFAYETTE ST	024-005-016-000	1 FAM HOUSE GARAGE .53A	210	VWWSR
268 LAFAYETTE ST	024-005-014-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
342 LAFAYETTE ST	024-005-035-000	1 FAM HOUSE GARAGE .82A	210	VWWSR
44 LADD AVE	027-003-007-000	1 FAM HOUSE GARAGE .61A	210	VWWSR
32 LIBERTY ST	027-002-028-000	1 FAM HOUSE .30A	210	VWWSR
64 MOUNTAIN AVE	024-005-032-000	1 FAM HOUSE (MODULAR) .25A	210	VWWSR
818 CONCORD AVE	027-003-006-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
128 LAFAYETTE ST	024-004-043-000	1 FAM HOUSE .23A	210	VWWSR
841 CONCORD AVE	027-002-029-000	1 FAM HOUSE GARAGE .37A	210	VWWSR
74 MOUNTAIN AVE	024-005-034-000	3 FAM HOUSE GARAGE 0.45	630	VWWSR
53 MOUNTAIN AVE	024-005-029-000	1 FAM HOUSE GARAGE .16A	210	VWWSR
79 BIRCHWOOD DR	024-005-041-000	1 FAM HOUSE GARAGE DECK 1.07 A	210	VWWSR
82 LAFAYETTE ST	024-004-042-000	1 FAM HOUSE .28A	210	VWWSR
842 CONCORD AVE	027-003-005-000	1 FAM HOUSE .26A	210	VWWSR
79 BIRCHWOOD DR	024-005-040-000	1 FAM HOUSE GARAGE DECK 1.07 A	210	VWWSR
79 BIRCHWOOD DR	024-005-039-000	1 FAM HOUSE GARAGE DECK 1.07 A	210	VWWSR
58 LAFAYETTE ST	024-004-041-000	1 FAM HOUSE 5.80A	210	VWWSR
74 MOUNTAIN AVE	024-005-033-000	3 FAM HOUSE GARAGE 0.45	630	VWWSR
51 BIRCHWOOD DR	024-005-038-000	1 FAM HOUSE .22A	210	VWWSR
81 MOUNTAIN AVE	024-005-030-000	2 FAM DWELLING .20A	420	VWWSR
854 CONCORD AVE	027-003-004-000	1 FAM HOUSE .15A	210	VWWSR
881 CONCORD AVE	027-002-030-000	HOUSE GARAGE .74A	210	VWWSR
106 MOUNTAIN AVE	024-005-037-000	1 FAM MOB HOME .42A	210	VWWSR
50 CLAYTON ST	027-003-008-000	1 FAM HOUSE GARAGE 1.70A	210	VWWSR
997 CONCORD AVE	027-002-033-000	1 FAM HOUSE GARAGE .53A	210	VWWSR
106 MOUNTAIN AVE	024-005-036-000	1 FAM MOB HOME .42A	210	VWWSR
75 LADD AVE	027-003-009-000	1 FAM HOUSE GARAGE 1.80A	210	VWWSR
115 MOUNTAIN AVE	024-005-031-000	LAND ONLY .41A	0	VWWSR
919 CONCORD AVE	027-002-031-000	1 FAM HOUSE MODULAR .42A	210	VWWSR
39 CLAYTON ST	027-003-003-000	1 FAM HOUSE .60A	210	VWWSR
8 PARKER AVE	027-003-019-000	1 FAM HOUSE GARAGE 1.00A	210	VWWSR
59 CLAYTON ST	027-003-017-000	1 FAM HOUSE .43A	210	VWWSR
981 CONCORD AVE	027-002-032-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
145 MOUNTAIN AVE	024-005-044-000	HOUSE 2 APTS 2.45 A	420	VWWSR
69 CLAYTON ST	027-003-018-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
50 CLAYTON ST	027-003-010-000	1 FAM HOUSE GARAGE 1.70A	210	VWWSR
17 PARKER AVE	027-003-024-000	1 FAM HOUSE .21A	210	VWWSR
91 CLAYTON ST	027-003-011-000	1 FAM HOUSE GARAGE .82	210	VWWSR
972 CONCORD AVE	027-003-025-000	1 FAM HOUSE .19A	210	VWWSR
1117 CONCORD AVE	027-002-035-000	1 FAM HOUSE .23A	210	VWWSR
91 CLAYTON ST	027-003-012-000	1 FAM HOUSE GARAGE .82	210	VWWSR
980 CONCORD AVE	027-003-026-000	1 FAM HOUSE 0.64	210	VWWSR
1133 CONCORD AVE	027-002-036-000	1 FAM HOUSE SHED .24A	210	VWWSR
1155 CONCORD AVE	027-002-037-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
980 CONCORD AVE	027-003-027-000	1 FAM HOUSE 0.64	210	VWWSR
1179 CONCORD AVE	027-002-038-000	1 FAM HOUSE GARAGE .45A	210	VWWSR
91 CLAYTON ST	027-003-016-000	1 FAM HOUSE GARAGE .82	210	VWWSR
42 PARKER AVE	027-003-020-000	MOBILE HOME GARAGE 1.20	210	VWWSR
1032 CONCORD AVE	027-003-028-000	1 FAM HOUSE MODULAR 1.00A	210	VWWSR
1201 CONCORD AVE	027-002-039-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
41 PARKER AVE	027-003-023-000	1 FAM HOUSE GARAGE .31A	210	VWWSR
125 OVERLOOK CIR	011-002-046-005	LAND ONLY 2.04A	0	VWWSR
44 PARKER AVE	027-003-021-000	1 FAM HOUSE .35A	210	VWWSR

Appendix A
Table 7 - CSO 011
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
121 RIDGEWOOD DR	027-003-029-000	1 FAM HOUSE POOL TENNIS COURT 4.36 A	210	VWWSR
1225 CONCORD AVE	027-002-040-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
122 RIDGEWOOD DR	027-003-030-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
179 MOUNTAIN AVE	024-005-046-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
99 CLAYTON ST	027-003-014-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
104 RIDGEWOOD DR	027-003-031-000	1 FAM HOUSE .29A	210	VWWSR
97 CLAYTON ST	027-003-015-000	1 FAM HOUSE GARAGE .73A	210	VWWSR
1249 CONCORD AVE	027-002-041-000	1 FAM HOUSE .27A	210	VWWSR
100 CLAYTON ST	027-003-013-000	1 FAM HOUSE GARAGE .81A	210	VWWSR
63 PARKER AVE	027-003-022-000	1 FAM HOUSE DECK .92A	210	VWWSR
86 RIDGEWOOD DR	027-003-032-000	1 FAM HOUSE .24A	210	VWWSR
1277 CONCORD AVE	027-002-045-000	1 FAM HOUSE GARAGE .39A	210	VWWSR
62 RIDGEWOOD DR	027-003-033-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
121 RIDGEWOOD DR	027-003-045-001	1 FAM HOUSE POOL TENNIS COURT 4.36 A	210	VWWSR
14 RIDGEWOOD DR	027-003-041-000	1 FAM HOUSE .33A	210	VWWSR
1303 CONCORD AVE	027-002-044-000	OFFICE BUILDING BROADCAST STUDIO 4.39 A	35	Water meter info
74 PARKER AVE	027-003-047-000	1 FAM HOUSE .16A	210	VWWSR
113 RIDGEWOOD DR	027-003-044-000	1 FAM HOUSE GARAGE .55A	210	VWWSR
79 PARKER AVE	027-003-046-001	1 FAM HOUSE .65A	210	VWWSR
75 OVERLOOK CIR	011-002-046-003	1 FAM HOUSE 1.5A	210	VWWSR
85 RIDGEWOOD DR	027-003-043-000	1 FAM HOUSE .53A	210	VWWSR
11 RIDGEWOOD DR	027-003-038-000	HOUSE 0.37	210	VWWSR
79 PARKER AVE	027-003-046-000	1 FAM HOUSE .65A	210	VWWSR
59 RIDGEWOOD DR	027-003-042-000	1 FAM HOUSE .57A	210	VWWSR
92 PARKER AVE	027-003-048-000	1 FAM HOUSE GARAGE .64A	210	VWWSR
1272 CONCORD AVE	027-003-037-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
1294 CONCORD AVE	027-003-036-000	1 FAM HOUSE GARAGE 1.36A	210	VWWSR
25 RIDGEWOOD DR	027-003-040-000	1 FAM HOUSE CARPORT .42A	210	VWWSR
121 RIDGEWOOD DR	027-003-045-002	1 FAM HOUSE POOL TENNIS COURT 4.36 A	210	VWWSR
1294 CONCORD AVE	027-003-036-002	1 FAM HOUSE GARAGE 1.36A	210	VWWSR
112 PARKER AVE	027-003-049-000	1 FAM HOUSE GARAGE 23.00A	210	VWWSR
23 RIDGEWOOD DR	027-003-039-000	1 FAM HOUSE .37A	210	VWWSR
35 OVERLOOK CIR	011-002-046-002	1 FAM DWELLING GARAGE .82A	210	VWWSR
1362 CONCORD AVE	027-003-036-001	1 FAM HOUSE .30A	210	VWWSR
197 PARKER AVE	011-002-046-009	1 FAM HOUSE GARAGE .88A	210	VWWSR
108 OVERLOOK CIR	011-002-046-007	UNFINISHED HOUSE 2.03A	210	VWWSR
Total Contributing Average Daily Flow			**105725**	**GPD**

Appendix A
Table 8 - CSO 014
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
1115 RAILROAD ST	020-001-004-000	1 FAM HOUSE DECK PORCH 1 A	210	VWWSR
983 RAILROAD ST	020-001-017-000	1 FAM HOUSE GARAGE .2A	210	VWWSR
37 EDGEHILL RD	020-001-021-000	1 FAM HOUSE GARAGE 1.80A	210	VWWSR
154 BOYNTON AVE	020-001-023-000	1 FAM HOUSE .34A	210	VWWSR
889 RAILROAD ST	020-001-018-000	2 SINGLE FAMILY HOUSES, GARAGE	210	VWWSR
1705 MAIN ST	020-001-027-000	1 FAM HOUSE GARAGE .83A	210	VWWSR
1749 MAIN ST	020-001-019-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
1735 MAIN ST	020-001-020-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
132 MILL ST	024-001-004-000	RETAIL REPAIR 0.29	150	VWWSR 15 PER PERSON (10 WORKERS)
1631 MAIN ST	023-003-014-000	1 FAM HOUSE GARAGE .91A	210	VWWSR
1700 MAIN ST	023-003-017-000	1 FAM. HOUSE GARAGE .36A	210	VWWSR
1752 MAIN ST	023-003-018-000	1 FAM HOUSE .19A	210	VWWSR
1782 MAIN ST	023-003-021-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
1768 MAIN ST	023-003-020-000	HOUSE GARAGE .38A	210	VWWSR
840 RAILROAD ST	024-001-003-000	BLDG .15	150	15 PER PERSON (10 WORKERS)
1658 MAIN ST	023-003-016-000	HOUSE 4 APTS 0.16	840	VWWSR
21 SPRUCE ST	023-003-022-000	3 APT. HOUSE GARAGE .16A	630	VWWSR
33 SPRUCE ST	023-003-023-000	1 FAM HOUSE .13A	210	VWWSR
49 SPRUCE ST	023-003-024-000	HOUSE 1 APT. GARAGE .27A	210	VWWSR
132 MILL ST	024-001-005-000	RETAIL REPAIR 0.29	150	VWWSR 15 PER PERSON (10 WORKERS)
1633 MAIN ST	023-003-013-000	HOUSE 2 APT. GARAGE .33 A	420	VWWSR
98 MILL ST	024-001-006-000	COMMERCIAL BLDG 0.22	150	VWWSR 15 PER PERSON (10 WORKERS)
57 SPRUCE ST	023-003-025-000	1 FAM HOUSE SHED .90A	210	VWWSR
1640 MAIN ST	023-003-015-000	HOUSE 3 APTS 0.37	630	VWWSR
22 MT PLEASANT ST	023-003-012-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
44 SPRUCE ST	023-003-028-000	1 FAM HOUSE .20A	210	VWWSR
287 NORTH AVE	023-003-029-000	1 FAM HOUSE .10A	210	VWWSR
815 RAILROAD ST	023-003-030-000	BLDG .26	150	VWWSR 15 PER PERSON (10 WORKERS)
1620 MAIN ST	023-003-043-000	1 FAM HOUSE GARAGE .74A	210	VWWSR
259 NORTH AVE	023-003-042-000	1 FAM HOUSE GARAGE .92A	210	VWWSR
1596 MAIN ST	023-003-044-000	1 FAM HOUSE .43 A	420	VWWSR
248 NORTH AVE	023-003-038-000	1 FAM HOUSE GARAGE .36A	210	VWWSR
1586 MAIN ST	023-003-045-000	1 FAM HOUSE GARAGE .63A	210	VWWSR
Total Contributing Average Daily Flow			**8520**	**GPD**

Appendix A
Table 9 - CSO 016
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
59 BUZZELL ST	021-001-043-000	1 FAM HOUSE GARAGE 1.4A	210	VWWSR
58 BUZZELL ST	021-001-044-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
42 BUZZELL ST	021-001-049-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
36 BUZZELL ST	021-001-050-000	1 FAM HOUSE GARAGE POOL .6A	210	VWWSR
47 BUZZELL ST	021-001-045-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
33 BUZZELL ST	021-001-046-000	1 FAM HOUSE .12A	210	VWWSR
77 CONCORD AVE	021-001-077-002	COMMERCIAL BLDG. 3 APT. .20	630	VWWSR
77 CONCORD AVE	021-001-081-000	COMMERCIAL BLDG. 3 APT. .20	630	VWWSR
80 CONCORD AVE	021-001-082-000	BLDG .21 ROSSI SEAL COATING CO	150	VWWSR 15 PER PERSON (10 WORKERS)
96 CONCORD AVE	021-001-083-000	MANUFACTURING PLANT 0.09	150	VWWSR 15 PER PERSON (10 WORKERS)
108 CONCORD AVE	024-001-010-000	BLDG .61	150	VWWSR 15 PER PERSON (10 WORKERS)
142 CONCORD AVE	024-001-013-000	1 FAM HOUSE .27	210	VWWSR
162 CONCORD AVE	024-001-014-000	1 FAM HOUSE GARAGE .43A	210	VWWSR
92 COOLIDGE CIR	011-001-043-000	1 FAM HOUSE GARAGE 1.18A	210	VWWSR
66 COOLIDGE CIR	011-001-078-000	1 FAM HOUSE .35 A	210	VWWSR
44 COOLIDGE CIR	011-001-079-000	MOBILE HOME .37 AC	210	VWWSR
10 COOLIDGE CIR	021-003-013-000	1 FAM HOUSE GARAGE .39A	210	VWWSR
37 DUNDEE ST	021-002-039-000	1 FAM HOUSE .12A	210	VWWSR
51 DUNDEE ST	021-002-040-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
69 DUNDEE ST	021-002-041-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
79 DUNDEE ST	021-002-042-000	1 FAM HOUSE .12A	210	VWWSR
89 DUNDEE ST	021-002-043-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
89 DUNDEE ST	021-002-044-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
10 DUNDEE ST	021-004-001-000	1 FAM HOUSE GARAGE .47A	210	VWWSR
30 DUNDEE ST	021-004-002-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
46 DUNDEE ST	021-004-003-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
66 DUNDEE ST	021-004-004-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
76 DUNDEE ST	021-004-005-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
122 EMERSON ST	021-001-035-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
82 EMERSON ST	021-002-062-000	1 FAM HOUSE GARAGE .22A	420	VWWSR
88 EMERSON ST	021-002-059-000	HOUSE 2 APT. GARAGE .21 A	420	VWWSR
46 EMERSON ST	021-002-056-000	1 FAM HOUSE .29A	210	VWWSR
68 EMERSON ST	021-002-058-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
56 EMERSON ST	021-002-057-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
109 EMERSON ST	021-001-036-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
95 EMERSON ST	021-001-033-000	1 FAM HOUSE .92 A	210	VWWSR
31 EMERSON ST	021-001-032-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
44 JONES ST	021-004-077-000	HOUSE 2 APT. GARAGE 0.31 A	420	VWWSR
32 JONES ST	021-004-074-000	2 FAM HOUSE 0.44	420	VWWSR
54 JONES ST	021-004-078-000	2 FAM HOUSE .07	420	VWWSR
26 JONES ST	021-004-075-000	HOUSE 3 APTS 0.26	630	VWWSR
12 JONES ST	021-004-076-000	HOUSE 3 APTS 0.47	630	VWWSR
8 MEMORIAL DR	020-002-037-000	AUTOMOTIVE CENTER 3.84	150	VWWSR 15 PER PERSON (10 WORKERS)
4 MEMORIAL DR	020-002-040-000	BLDG 1.7	150	VWWSR 15 PER PERSON (10 WORKERS)
27 MORGAN CIR	021-003-015-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
22 MORGAN CIR	021-003-020-000	1 FAM HOUSE GARAGE .31A	210	VWWSR
49 MORGAN CIR	021-003-016-000	1 FAM HOUSE GARAGE .39A	210	VWWSR
66 MORGAN CIR	021-003-019-000	1 FAM HOUSE GARAGE STORAGE SHED	210	VWWSR
61 MORGAN CIR	021-003-017-000	1 FAM HOUSE GARAGE .52A	210	VWWSR
77 MORGAN CIR	021-003-018-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
29 NELSON ST	021-002-031-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
49 NELSON ST	021-002-032-000	1 FAM HOUSE .17A	210	VWWSR
69 NELSON ST	021-002-033-000	1 FAM HOUSE DECK GARAGE .17A	210	VWWSR
28 NELSON ST	021-002-035-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
48 NELSON ST	021-002-036-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
70 NELSON ST	021-002-037-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
186 OAK ST	020-002-042-000	MOBILE HOME 0.65	210	VWWSR
0 OAK ST	021-001-056-000	MOBILE HOME PARK- 8 SITES 0.83	1680	VWWSR
140 OAK ST	021-001-055-000	1 FAM HOUSE .18A	210	VWWSR
127 OAK ST	021-001-057-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
113 OAK ST	021-001-067-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
95 OAK ST	021-001-068-000	1 FAM HOUSE .26A	210	VWWSR
72 OAK ST	021-001-065-000	MOBILE HOME GARAGE .18 (SKY LINE 1	210	VWWSR
79 OAK ST	021-001-069-000	1 FAM HOUSE .15A	210	VWWSR
34 OAK ST	021-001-064-000	HOUSE 2 APT GARAGE SHED .28A	420	VWWSR
67 OAK ST	021-001-070-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
41 OAK ST	021-001-071-000	HOUSE 3 APARTMENTS 0.15	630	VWWSR
34 OAK ST	021-001-072-000	HOUSE 2 APT GARAGE SHED .28A	420	VWWSR
27 ORIENT ST	021-004-066-000	HOUSE GARAGE 2 APT 0.53A	420	VWWSR

Appendix A
Table 9 - CSO 016
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
34 ORIENT ST	021-004-067-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
2 ORIENT ST	021-004-063-000	1 FAM HOUSE GARAGE .47A	210	VWWSR
10 ORIENT ST	021-004-064-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
47 ORIENT ST	021-004-068-000	1 FAM HOUSE .19A	210	VWWSR
53 ORIENT ST	021-004-069-000	1 FAM HOUSE GARAGE .59A	210	VWWSR
54 ORIENT ST	021-004-072-000	1 FAM HOUSE GARAGE .41A	210	VWWSR
516 PLEASANT ST	021-002-015-000	1 FAM HOUSE GARAGE .42A	210	VWWSR
494 PLEASANT ST	021-002-016-000	1 FAM HOUSE GARAGE .63A	210	VWWSR
472 PLEASANT ST	021-002-017-000	1 FAM HOUSE GARAGE .16A	210	VWWSR
435 PLEASANT ST	021-002-022-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
448 PLEASANT ST	021-002-034-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
425 PLEASANT ST	021-002-030-000	1 FAM HOUSE GARAGE .49A	210	VWWSR
424 PLEASANT ST	021-002-038-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
403 PLEASANT ST	021-002-029-000	HOUSE 2 APT. GARAGE .26A	420	VWWSR
389 PLEASANT ST	021-002-028-000	1 FAM HOUSE .18A	210	VWWSR
371 PLEASANT ST	021-002-051-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
380 PLEASANT ST	021-004-014-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
358 PLEASANT ST	021-004-013-000	1 FAM HOUSE GARAGE .44A	210	VWWSR
355 PLEASANT ST	021-002-052-000	HOUSE- 2 APT. GARAGE .40	420	VWWSR
368 PLEASANT ST	021-004-015-000	1 FAM HOUSE .13A	210	VWWSR
337 PLEASANT ST	021-002-053-000	HOUSE 0.27	210	VWWSR
350 PLEASANT ST	021-004-016-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
319 PLEASANT ST	021-002-054-000	1 FAM HOUSE .53A	210	VWWSR
340 PLEASANT ST	021-004-017-000	1 FAM HOUSE POOL .18A	210	VWWSR
326 PLEASANT ST	021-004-018-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
295 PLEASANT ST	021-001-031-000	HOUSE 2 APTS GARAGE .29 A	420	VWWSR
310 PLEASANT ST	021-004-019-000	HOUSE- 2 APT. 0.24A	420	VWWSR
304 PLEASANT ST	021-004-025-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
278 PLEASANT ST	021-004-024-000	1 FAM HOUSE .22A	210	VWWSR
274 PLEASANT ST	021-004-023-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
243 PLEASANT ST	021-001-048-000	1 FAM HOUSE .31A	210	VWWSR
266 PLEASANT ST	021-004-022-000	1 FAM HOUSE .18A	210	VWWSR
211 PLEASANT ST	021-001-051-000	HOUSE 5 APARTMENTS 1.70	1050	VWWSR
256 PLEASANT ST	021-004-021-000	1 FAM HOUSE GARAGE .16A	210	VWWSR
229 PLEASANT ST	021-001-047-000	HOUSE 2 APT. .22A	420	VWWSR
236 PLEASANT ST	021-004-020-000	2 FAM HOUSE .26A	420	VWWSR
212 PLEASANT ST	021-004-047-000	APARTMENT HOUSE- 4 UNITS 0.27	840	VWWSR
183 PLEASANT ST	021-001-054-000	1 FAM HOUSE 1.4A	210	VWWSR
193 PLEASANT ST	021-001-052-000	CHURCH .25 A	150	VWWSR 15 PER PERSON (10 WORKERS)
196 PLEASANT ST	021-004-048-000	1 FAM HOUSE .23A	210	VWWSR
172 PLEASANT ST	021-004-049-000	1 FAM HOUSE CARPORT .09A	210	VWWSR
155 PLEASANT ST	021-001-053-000	1 FAM HOUSE GARAGE 1.4A	210	VWWSR
156 PLEASANT ST	021-004-050-000	1 FAM HOUSE .21A	210	VWWSR
144 PLEASANT ST	021-004-051-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
117 PLEASANT ST	021-001-066-000	HOUSE- 2 APARTMENTS 0.53 A	420	VWWSR
130 PLEASANT ST	021-004-052-000	1 FAM HOUSE .25A	210	VWWSR
121 PLEASANT ST	021-001-058-000	1 FAM HOUSE .18A	210	VWWSR
109 PLEASANT ST	021-001-059-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
89 PLEASANT ST	021-001-060-000	1 FAM HOUSE .20 A	210	VWWSR
79 PLEASANT ST	021-001-061-000	1 FAM HOUSE .18A	210	VWWSR
69 PLEASANT ST	021-001-062-000	1 FAM HOUSE .14A	210	VWWSR
58 PLEASANT ST	021-004-055-000	1 FAM HOUSE .37A	210	VWWSR
53 PLEASANT ST	021-001-078-000	1 FAM HOUSE .28A	210	VWWSR
31 PLEASANT ST	021-001-073-000	HOUSE 2 APT. GARAGE .18A	420	VWWSR
39 PLEASANT ST	021-001-079-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
29 PLEASANT ST	021-001-074-000	1 FAM HOUSE .12A	210	VWWSR
27 PLEASANT ST	021-001-075-000	1 FAM HOUSE .05A	210	VWWSR
17 PLEASANT ST	021-001-076-000	HOUSE 2 APT. .16A	420	VWWSR
19 PLEASANT ST	021-001-080-000	1 FAM HOUSE .11A	210	VWWSR
5 RUSSELL AVE	021-001-021-000	1 FAM HOUSE .11A	210	VWWSR
17 RUSSELL AVE	021-001-025-000	1 FAM HOUSE GARAGE .11A	210	VWWSR
31 RUSSELL AVE	021-001-026-000	1 FAM HOUSE GARAGE .11A	210	VWWSR
43 RUSSELL AVE	021-001-027-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
8 RUSSELL AVE	021-002-066-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
20 RUSSELL AVE	021-002-065-000	1 FAM HOUSE GARAGE .08A	210	VWWSR
26 RUSSELL AVE	021-002-064-000	1 FAM HOUSE GARAGE .08A	210	VWWSR
38 RUSSELL AVE	021-002-063-000	1 FAM HOUSE .13A	210	VWWSR
50 RUSSELL AVE	021-002-055-000	1 FAM HOUSE .19A	210	VWWSR
67 SCHOOL ST	021-004-041-000	1 FAM HOUSE 2.00A	210	VWWSR

Appendix A
Table 9 - CSO 016
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
41 SCHOOL ST	021-004-045-000	2 FAM HOUSE GARAGE 0.23A	420	VWWSR
28 SCHOOL ST	021-004-044-000	1 FAM HOUSE .13A	210	VWWSR
38 SCHOOL ST	021-004-043-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
74 SCHOOL ST	021-004-042-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
75 SCHOOL ST	021-004-040-000	2 FAM HOUSE 0.24	420	VWWSR
85 SCHOOL ST	021-004-039-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
102 SCHOOL ST	021-004-059-000	1 FAM HOUSE GARAGE .59A	210	VWWSR
97 SCHOOL ST	021-004-038-000	2 FAM HOUSE 0.21	420	VWWSR
125 SCHOOL ST	021-004-065-000	CALEDONIA SCHOOL .88 ARLINGTON	1000	VWWSR
200 SCHOOL ST	021-004-053-000	HOUSE GARAGE 3 APT 0.31	630	VWWSR
188 SCHOOL ST	021-004-057-000	1 FAM HOUSE .19A	210	VWWSR
172 SCHOOL ST	021-004-058-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
134 SCHOOL ST	021-004-062-000	HOUSE GARAGE 0.28 A	210	VWWSR
205 SCHOOL ST	021-004-054-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
187 SCHOOL ST	021-004-056-000	1 FAM HOUSE GARAGE .35 A	210	VWWSR
173 SCHOOL ST	021-004-060-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
163 SCHOOL ST	021-004-061-000	2 APT HOUSE GARAGE 0.47	420	VWWSR
163 SCHOOL ST	021-004-073-000	2 APT HOUSE GARAGE 0.47	420	VWWSR
53 SHETLAND CIR	011-001-040-000	1 FAM HOUSE 2.1A	210	VWWSR
56 SHETLAND CIR	011-001-041-000	1 FAM HOUSE DECK GARAGE .46A	210	VWWSR
12 SHETLAND CIR	011-001-042-000	1 FAM HOUSE GARAGE 1.88A	210	VWWSR
12 SHETLAND CIR	011-001-039-000	1 FAM HOUSE GARAGE 1.88A	210	VWWSR
12 SHETLAND CIR	021-003-006-000	1 FAM HOUSE GARAGE 1.88A	210	VWWSR
12 SHETLAND CIR	011-001-038-000	1 FAM HOUSE GARAGE 1.88A	210	VWWSR
6 SOUTHARD ST	021-001-005-000	1 FAM HOUSE .12A	210	VWWSR
16 SOUTHARD ST	021-001-030-000	1 FAM HOUSE .18A	210	VWWSR
13 SOUTHARD ST	021-002-020-000	1 FAM HOUSE .12A	210	VWWSR
36 SOUTHARD ST	021-001-029-000	1 FAM HOUSE .32A	210	VWWSR
21 SOUTHARD ST	021-002-023-000	1 FAM HOUSE .10A	210	VWWSR
35 SOUTHARD ST	021-002-024-000	1 FAM HOUSE .11A	210	VWWSR
54 SOUTHARD ST	021-001-028-000	CHURCH 0.34	150	VWWSR 15 PER PERSON (10 WORKERS)
47 SOUTHARD ST	021-002-025-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
61 SOUTHARD ST	021-002-026-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
79 SOUTHARD ST	021-002-027-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
258 ST JOHN	021-001-006-000	1 FAM HOUSE .11A	210	VWWSR
308 ST JOHN	021-002-021-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
33 STILES TER	021-004-046-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
200 TREMONT ST	020-002-036-000	HOUSE GARAGE 1.00A	210	VWWSR
214 TREMONT ST	021-001-040-000	1 FAM HOUSE GARAGE .44A	210	VWWSR
234 TREMONT ST	021-001-041-000	1 FAM HOUSE GARAGE 1.56A	210	VWWSR
245 TREMONT ST	021-001-037-000	1 FAM HOUSE .60A	210	VWWSR
234 TREMONT ST	021-001-042-000	1 FAM HOUSE GARAGE 1.56A	210	VWWSR
245 TREMONT ST	021-001-038-000	1 FAM HOUSE .60A	210	VWWSR
12 UNION ST	021-001-008-000	1 FAM HOUSE .17A	210	VWWSR
19 UNION ST	021-001-007-000	1 FAM HOUSE .30A	210	VWWSR
31 UNION ST	021-001-024-000	1 FAM HOUSE POOL .16A	210	VWWSR
52 UNION ST	021-001-019-000	1 FAM HOUSE .50A	210	VWWSR
49 UNION ST	021-001-023-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
74 UNION ST	021-001-018-000	1 FAM HOUSE GARAGE .36A	210	VWWSR
67 UNION ST	021-001-022-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
80 UNION ST	021-001-016-000	1 FAM HOUSE .37A	210	VWWSR
98 UNION ST	021-001-017-000	1 FAM HOUSE 0.23	210	VWWSR
107 UNION ST	021-002-061-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
130 UNION ST	021-001-034-000	HOUSE 0.28	210	VWWSR
119 UNION ST	021-002-060-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
243 WATERMAN CIR	021-004-006-000	1 FAM HOUSE GARAGE .70A	210	VWWSR
153 WATERMAN CIR	021-004-011-000	1 FAM HOUSE GARAGE .48A	210	VWWSR
241 WATERMAN CIR	021-002-050-000	1 FAM HOUSE GARAGE .39	210	VWWSR
169 WATERMAN CIR	021-004-010-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
189 WATERMAN CIR	021-004-009-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
209 WATERMAN CIR	021-004-008-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
227 WATERMAN CIR	021-004-007-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
245 WATERMAN CIR	021-002-049-000	1 FAM HOUSE GARAGE 0.66 A	210	VWWSR
129 WATERMAN CIR	021-004-012-000	1 FAM HOUSE GARAGE .83A	210	VWWSR
122 WATERMAN CIR	021-004-027-000	1 FAM HOUSE CARPORT .43A	210	VWWSR
257 WATERMAN CIR	021-002-048-000	1 FAM HOUSE GARAGE .43A	210	VWWSR
76 WATERMAN CIR	021-004-028-000	1 FAM HOUSE GARAGE .79A	210	VWWSR
18 WATERMAN CIR	021-004-030-000	1 FAM HOUSE GARAGE .56A	210	VWWSR
46 WATERMAN CIR	021-004-029-000	1 FAM HOUSE GARAGE .61A	210	VWWSR

Appendix A
Table 9 - CSO 016
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
273 WATERMAN CIR	021-002-067-000	1 FAM HOUSE GARAGE .33A	210	VWWSR
21 WATERMAN CIR	021-003-011-000	1 FAM HOUSE GARAGE 1.60 A	210	VWWSR
510 FARMER DR	021-003-005-001	1 FAM HOUSE 1.17A	210	VWWSR
439 FARMER DR	021-002-045-000	1 FAM HOUSE GARAGE .88A	210	VWWSR
421 FARMER DR	021-002-046-000	1 FAM HOUSE GARAGE .46A	210	VWWSR
394 FARMER DR	021-003-007-000	1 FAM HOUSE GARAGE .38A	210	VWWSR
387 FARMER DR	021-002-071-000	1 FAM HOUSE GARAGE .46A	210	VWWSR
373 FARMER DR	021-002-072-000	1 FAM HOUSE GARAGE .46A	210	VWWSR
49 FARMER DR	021-002-068-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
77 FARMER DR	021-002-069-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
322 FARMER DR	021-003-014-000	1 FAM HOUSE GARAGE .41A	210	VWWSR
64 FARMER DR	021-003-012-000	1 FAM HOUSE GARAGE SHED .55 A	210	VWWSR
101 FARMER DR	021-002-070-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
143 FARMER DR	021-002-076-000	1 FAM HOUSE .738A	210	VWWSR
94 FARMER DR	021-003-032-000	1 FAM HOUSE GARAGE .60A	210	VWWSR
163 FARMER DR	021-002-075-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
191 FARMER DR	021-002-074-000	1 FAM HOUSE .34A	210	VWWSR
221 FARMER DR	021-002-073-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
122 FARMER DR	021-003-027-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
154 FARMER DR	021-003-026-000	1 FAM HOUSE GARAGE .37A	210	VWWSR
188 FARMER DR	021-003-025-000	1 FAM HOUSE .35A	210	VWWSR
248 FARMER DR	021-003-022-000	1 FAM HOUSE GARAGE .57A	210	VWWSR
214 FARMER DR	021-003-024-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
236 FARMER DR	021-003-023-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
321 GILMAN AVE	021-004-031-000	1 FAM HOUSE CARPORT .38A	210	VWWSR
324 GILMAN AVE	021-003-010-000	1 FAM HOUSE .35A	210	VWWSR
307 GILMAN AVE	021-004-032-000	1 FAM HOUSE GARAGE .31A	210	VWWSR
304 GILMAN AVE	021-003-009-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
287 GILMAN AVE	021-004-033-000	1 HOUSE GARAGE .28A	210	VWWSR
286 GILMAN AVE	021-003-008-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
269 GILMAN AVE	021-004-034-000	1 FAM HOUSE .28A	210	VWWSR
268 GILMAN AVE	021-003-034-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
251 GILMAN AVE	021-004-035-000	1 FAM HOUSE GARAGE .37A	210	VWWSR
234 GILMAN AVE	021-003-035-000	1 FAM HOUSE .41A	210	VWWSR
233 GILMAN AVE	021-004-036-000	1 FAM HOUSE GARAGE .53A	210	VWWSR
216 GILMAN AVE	021-003-036-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
203 GILMAN AVE	021-004-037-000	1 FAM HOUSE .73A	210	VWWSR
140 GILMAN AVE	021-003-037-000	1 FAM HOUSE .81A	210	VWWSR
41 GILMAN AVE	021-004-071-002	4 HOUSES GARAGE 1.44A	210	VWWSR
41 GILMAN AVE	021-004-070-000	4 HOUSES GARAGE 1.44A	210	VWWSR
36 GILMAN AVE	024-002-004-000	HOUSE 3 APT. GARAGE .30A	630	VWWSR
41 GILMAN AVE	024-002-001-000	4 HOUSES GARAGE 1.44A	210	VWWSR
86 STEALTH RIDGE	021-003-033-000	LAND ONLY 8.80	210	VWWSR
190 STEALTH RIDGE	021-003-044-000	1 FAM HOUSE 3.8A	210	VWWSR
16 LAWRENCE CIR	021-003-031-000	1 FAM HOUSE GARAGE .45A	210	VWWSR
34 LAWRENCE CIR	021-003-030-000	1 FAM HOUSE GARAGE .61A	210	VWWSR
71 LAWRENCE CIR	021-003-028-000	1 FAM HOUSE GARAGE 1.40A	210	VWWSR
61 LAWRENCE CIR	021-003-029-000	1 FAM HOUSE GARAGE .65A	210	VWWSR
92 LAWRENCE CIR	021-003-038-000	1 FAM HOUSE GARAGE .61A	210	VWWSR
172 LAWRENCE CIR	021-003-043-000	1 FAM HOUSE GARAGE .85A	210	VWWSR
166 LAWRENCE CIR	021-003-042-000	1 FAM HOUSE GARAGE DECK .43A	210	VWWSR
118 LAWRENCE CIR	021-003-039-000	1 FAM HOUSE GARAGE POOL .83A	210	VWWSR
146 LAWRENCE CIR	021-003-041-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
134 LAWRENCE CIR	021-003-040-000	1 FAM HOUSE GARAGE .92A	210	VWWSR
Total Contributing Average Daily Flow			**65680**	**GPD**

Appendix A
Table 10 - CSO 020
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
2 MEMORIAL DR	020-002-039-000	BLDG .75	750	VWWSR 30 PER PERSON (25 PEOPLE)
1169 RAILROAD ST	020-001-005-000	AUBERSON	150	VWWSR 15 PER PERSON (10 PEOPLE)
205 HASTINGS HILL	020-001-009-000	RESTAURANT .46	250	VWWSR 5 PER PERSON (50 PEOPLE)
206 BOYNTON AVE	020-001-015-000	1 FAM HOUSE GARAGE 1.2A	210	VWWSR
182 BOYNTON AVE	020-001-016-000	1 FAM HOUSE GARAGE 1.8A	210	VWWSR
212 HASTINGS HILL	020-001-010-000	BOWLING ALLEY 2.2	1200	VWWSR 75 PER LANE
151 HASTINGS HILL	020-001-008-000	MOTEL ANNEX 1.80A 34 UNITS	3400	VWWSR 2 PER ROOM 50 PER PERSON
167 BOYNTON AVE	020-001-014-000	1 FAM HOUSE .64A	210	VWWSR
163 GREEN ST	020-001-013-000	2 APT HOUSE .12 A	420	VWWSR
149 GREEN ST	020-001-012-000	1 FAM HOUSE .10A	210	VWWSR
170 BOYNTON AVE	020-001-022-000	1 FAM HOUSE .29A	210	VWWSR
147 BOYNTON AVE	020-001-029-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
129 GREEN ST	020-001-042-000	1 FAM HOUSE .17A	210	VWWSR
118 HASTINGS HILL	020-001-048-000	1 FAM HOUSE GARAGE .65A	210	VWWSR
131 BOYNTON AVE	020-001-036-000	1 FAM HOUSE BARN .46A	210	VWWSR
131 BOYNTON AVE	020-001-030-000	1 FAM HOUSE BARN .46A	210	VWWSR
115 GREEN ST	020-001-043-000	1 FAM HOUSE .11A	210	VWWSR
119 BOYNTON AVE	020-001-037-000	1 FAM HOUSE SHED .52A	210	VWWSR
119 BOYNTON AVE	020-001-031-000	1 FAM HOUSE SHED .52A	210	VWWSR
95 HASTINGS HILL	020-001-053-000	1 FAM HOUSE GARAGE .45A	210	VWWSR
98 GREEN ST	020-001-039-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
35 RANDALL ST	020-001-038-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
154 BOYNTON AVE	020-001-024-000	1 FAM HOUSE .34A	210	VWWSR
91 GREEN ST	020-001-044-000	1 FAM HOUSE .10A	210	VWWSR
131 BOYNTON AVE	020-001-025-000	1 FAM HOUSE BARN .46A	210	VWWSR
27 RANDALL ST	020-001-035-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
106 HASTINGS HILL	020-001-049-000	HOUSE 2 APT. GARAGE .18 A	420	VWWSR
119 BOYNTON AVE	020-001-026-000	1 FAM HOUSE SHED .52A	210	VWWSR
99 BOYNTON AVE	020-001-032-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
79 GREEN ST	020-001-045-000	1 FAM HOUSE .10A	210	VWWSR
88 BOYNTON AVE	020-001-028-000	1 FAM HOUSE .43A	210	VWWSR
96 HASTINGS HILL	020-001-050-000	1 FAM HOUSE .10A	210	VWWSR
76 GREEN ST	020-001-040-000	1 FAM HOUSE SHED .19A	210	VWWSR
79 BOYNTON AVE	020-001-033-000	2 FAM DWELLING .21A	420	VWWSR
78 HASTINGS HILL	020-001-051-000	LAND ONLY 0.14	0	VWWSR
69 GREEN ST	020-001-046-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
61 GREEN ST	020-001-047-000	1 FAM HOUSE .19A	210	VWWSR
56 GREEN ST	020-001-041-000	1 FAM HOUSE .20A	420	VWWSR
65 BOYNTON AVE	020-001-034-000	HOUSE GARAGE .24A	210	VWWSR
8 WESLEY DR	023-002-022-000	HOUSE-2 APTS GARAGE 0.31	420	VWWSR
46 HASTINGS HILL	023-003-001-000	1 FAM HOUSE .35A	210	VWWSR
70 BOYNTON AVE	023-003-011-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
43 GREEN ST	023-003-002-000	1 FAM HOUSE .18A	210	VWWSR
53 BOYNTON AVE	023-003-006-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
44 GREEN ST	023-003-004-000	HOUSE 2 APT .14 A	420	VWWSR
58 BOYNTON AVE	023-003-010-000	1 FAM HOUSE .15A	210	VWWSR
27 GREEN ST	023-003-003-000	1 FAM HOUSE .18A	210	VWWSR
58 MT PLEASANT ST	023-003-007-000	6 APT HOUSE 0.27A	1260	VWWSR
80 MT PLEASANT ST	023-003-005-000	HOUSE 2 APTS GARAGE 0.35	420	VWWSR
42 BOYNTON AVE	023-003-009-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
42 BOYNTON AVE	023-003-009-001	1 FAM HOUSE GARAGE .23A	210	VWWSR
32 MT PLEASANT ST	023-003-008-000	1 FAM HOUSE GARAGE POOL .27 A	210	VWWSR
656 SUMMER ST	023-002-028-000	2 APT HOUSE 0.27	420	VWWSR
99 CLINTON AVE	023-002-029-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
75 MT PLEASANT ST	023-002-030-000	OFFICE BUILDING 0.12	150	VWWSR 15 PER PERSON (10 PEOPLE)
63 MT PLEASANT ST	023-002-031-000	3 FAM HOUSE GARAGE 0.10	630	VWWSR
81 CLINTON AVE	023-002-042-000	2 APT HOUSE GARAGE 0.16	420	VWWSR
88 CLINTON AVE	023-002-041-000	1 FAM HOUSE .05	210	VWWSR
78 CLINTON AVE	023-002-040-000	1 FAM HOUSE .12A	210	VWWSR
69 CLINTON AVE	023-002-043-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
46 CLINTON AVE	023-002-039-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
61 CLINTON AVE	023-002-044-000	1 FAM HOUSE .15A	210	VWWSR
1557 MAIN ST	023-002-035-000	2 1 FAM HOUSES GARAGE .29A	420	VWWSR
53 CLINTON AVE	023-002-038-000	1 FAM HOUSE .10A	210	VWWSR
Total Contributing Average Daily Flow			**21440**	**GPD**

Appendix A
Table 11 - CSO 021
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
125 CENTERVIEW TER	029-001-057-000	1 FAM HOUSE 1.6A	210	VWWSR
165 CENTERVIEW TER	029-001-056-000	1 FAM HOUSE .96A	210	VWWSR
183 CENTERVIEW TER	029-001-055-000	1 FAM HOUSE GARAGE POOL 1.1A	210	VWWSR
186 CENTERVIEW TER	029-001-054-000	1 FAM HOUSE POOL 1.8A	210	VWWSR
121 CENTERVIEW TER	029-001-058-000	1 FAM HOUSE .35A	210	VWWSR
115 BRUNELL ST	010-000-017-000	1 FAM HOUSE GARAGE POOL .65A	210	VWWSR
150 CENTERVIEW TER	029-001-060-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
170 CENTERVIEW TER	029-001-059-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
126 CENTERVIEW TER	029-001-061-000	1 FAM HOUSE .18A	210	VWWSR
11 MCGILL AVE	020-002-005-000	6 APT./MOBILE HOME PARK 2.6 A	1260	VWWSR
145 BRUNELL ST	021-001-001-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
97 BRUNELL ST	020-002-006-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
71 CENTERVIEW TER	021-002-001-000	1 FAM HOUSE .48A	210	VWWSR
96 BRUNELL ST	020-002-008-000	1 FAM HOUSE .19A	210	VWWSR
81 BRUNELL ST	020-002-007-000	1 FAM HOUSE CARPORT .28A	210	VWWSR
144 BRUNELL ST	021-001-002-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
62 BRUNELL ST	020-002-009-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
44 BRUNELL ST	021-001-003-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
45 BRUNELL ST	020-002-010-000	1 FAM HOUSE GARAGE .36A	210	VWWSR
30 CENTERVIEW TER	021-002-002-000	1 FAM HOUSE GARAGE .87A	210	VWWSR
59 CENTERVIEW TER	021-001-004-000	1 FAM HOUSE .19A	210	VWWSR
20 BRUNELL ST	021-001-013-000	1 FAM HOUSE .46 A	210	VWWSR
17 BRUNELL ST	020-002-011-000	1 FAM HOUSE GARAGE .41A	210	VWWSR
13 CENTERVIEW TER	021-001-012-000	1 FAM HOUSE GARAGE .40A	210	VWWSR
36 MEMORIAL DR	020-002-004-000	QUALITY MOTORS SALES BLDG. .36A	180	METERING INFO
33 MEMORIAL DR	020-002-022-000	HOUSE 3 APT. GARAGE .15A	630	VWWSR
31 MEMORIAL DR	020-002-023-000	1 FAM HOUSE .14A	210	VWWSR
27 MEMORIAL DR	020-002-024-000	1 FAM HOUSE GARAGE KOFFEE CUP .74	210	VWWSR
17 BRAGG TER	020-002-014-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
18 SUFFOLK ST	020-002-012-000	1 FAM HOUSE GARAGE .88A	210	VWWSR
18 BRAGG TER	020-002-017-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
28 ST JOHN ST	020-002-018-000	1 FAM HOUSE GARAGE .57A	210	VWWSR
26 MEMORIAL DR	020-002-020-000	OFFICE BLDG. .21A	150	METERING INFO
18 SUFFOLK ST	021-001-011-000	1 FAM HOUSE GARAGE .88A	210	VWWSR
18 ARLINGTON TER	021-001-010-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
27 BRAGG TER	020-002-015-000	1 FAM HOUSE GARAGE SHED .22A	210	VWWSR
200 ST JOHN ST	021-001-009-000	4 FAM HOUSE GARAGE 1.20	840	VWWSR
26 BRAGG TER	020-002-016-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
46 SUFFOLK ST	020-002-013-000	1 FAM HOUSE GARAGE .54A	210	VWWSR
21 MEMORIAL DR	020-002-025-000	RETAIL BUILDING 0.41	170	METERING INFO
115 TREMONT ST	020-002-034-000	2 FAM HOUSE 1.60	420	VWWSR
49 TREMONT ST	020-002-021-002	1 FAM HOUSE .47A	210	VWWSR
46 ARLINGTON TER	021-001-014-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
30 UNION ST	021-001-020-000	1 FAM HOUSE CARPORT .20A	210	VWWSR
49 TREMONT ST	020-002-030-000	1 FAM HOUSE .47A	210	VWWSR
127 TREMONT ST	020-002-035-000	1 FAM HOUSE GARAGE .55A	210	VWWSR
20 TREMONT ST	020-002-027-000	HOUSE .39A	210	VWWSR
40 TREMONT ST	020-002-029-000	1 FAM HOUSE CARPORT .12A	210	VWWSR
62 TREMONT ST	020-002-031-000	1 FAM HOUSE GARAGE 1.20A	210	VWWSR
183 TREMONT ST	021-001-015-000	1 FAM HOUSE GARAGE .63A	210	VWWSR
70 TREMONT ST	020-002-033-000	HOUSE-3 APTS GARAGE 2.80	630	VWWSR
92 TREMONT ST	020-002-032-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
8 TREMONT ST	020-002-028-000	HOUSE- 3 APARTMENTS 0.35	630	VWWSR
194 TREMONT ST	021-001-039-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
Total Contributing Average Daily Flow			**14360**	**GPD**

Appendix A
Table 12 - CSO 023
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
401 WESTERN AVE	023-006-058-000	FAIRBANKS MOTOR INN 45 UNITS 4.13 A	9000	VWWSR 200 PER ROOM
184 MT VERNON ST	022-000-053-000	1 FAM HOUSE GARAGE 1.00A	210	VWWSR
90 MT VERNON ST	022-000-047-000	HOUSE 2 APT .65 A	420	VWWSR
112 MT VERNON ST	022-000-048-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
357 WESTERN AVE	023-006-057-000	OFFICE BUILDING 0.57	150	VWWSR 15 PER PERSON (10 PEOPLE)
58 MT VERNON ST	022-000-045-000	4 APT. HOUSE .13A	840	VWWSR
78 MT VERNON ST	022-000-046-000	1 FAM HOUSE .09A	210	VWWSR
40 CROW HILL RD	025-000-001-000	1 FAM HOUSE GARAGE 20.80A	210	VWWSR
148 MT VERNON ST	022-000-052-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
93 MT VERNON ST	022-000-044-000	2 APT HOUSE .71	420	VWWSR
77 MT VERNON ST	022-000-043-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
30 HIGH ST	022-000-042-000	1 FAM HOUSE GARAGE .93A	210	VWWSR
175 MT VERNON ST	022-000-050-000	1 FAM HOUSE .39A	210	VWWSR
68 HIGH ST	025-000-002-000	4 APT. HOUSE GARAGE .30A	840	VWWSR
72 HIGH ST	025-000-003-000	LAND ONLY .3 A	0	VWWSR
90 HIGH ST	025-000-004-000	APT HOUSE 6 UNITS 0.25	1260	VWWSR
104 HIGH ST	025-000-005-000	1 FAM HOUSE .21A	210	VWWSR
120 HIGH ST	025-000-006-000	1 FAM HOUSE .53A	210	VWWSR
27 CROW HILL RD	025-000-007-000	1 FAM HOUSE GARAGE .73A	210	VWWSR
33 CROW HILL RD	025-000-008-000	1 FAM HOUSE GARAGE .82A	210	VWWSR
149 CROW HILL RD	025-000-015-000	2 APT HOUSE BARN 33.5A	420	VWWSR
169 CROW HILL RD	025-000-014-000	1 FAM HOUSE .50A	210	VWWSR
149 CROW HILL RD	025-000-018-000	2 APT HOUSE BARN 33.5A	420	VWWSR
Total Contributing Average Daily Flow			**16500**	**GPD**

Appendix A
Table 13 - CSO 024
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
257 WESTERN AVE	023-006-056-000	ST JOHNSBURY ELEMENTARY SCHOOL 13.9	21625	VWWSR 25 PER PERSON (700 STUDENTS 165 FACULTY)
177 WESTERN AVE	026-001-003-000	OFFICE APT BUILDING 3 UNITS .56 A	630	VWWSR
Total Contributing Average Daily Flow			**22255**	**GPD**

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
20 GRANDVIEW TER	020-001-080-000	1 FAM HOUSE BARN 7.9 A	210	VWWSR
87 GRANDVIEW TER	020-001-085-000	1 FAM HOUSE GARAGE 5.45A PVT ROAD	210	VWWSR
87 GRANDVIEW TER	020-001-084-000	1 FAM HOUSE GARAGE 5.45A PVT ROAD	210	VWWSR
98 HARVEY ST	020-001-073-000	1 FAM HOUSE .51A	210	VWWSR
130 HARVEY ST	020-001-078-000	1 FAM HOUSE .65A	210	VWWSR
295 MT PLEASANT ST	020-001-060-000	HOUSE 2 APTS GARAGE 0.46	420	VWWSR
106 HARVEY ST	020-001-077-000	1 FAM HOUSE .71A	210	VWWSR
187 OVERCLIFF RD	023-001-036-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
281 MT PLEASANT ST	020-001-061-000	2 APT HOUSE 0.50	420	VWWSR
92 HARVEY ST	020-001-075-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
69 HARVEY ST	020-001-072-000	3 FAM HOUSE 0.38	630	VWWSR
32 WESLEY DR	020-001-055-000	HOUSE 3 APTS GARAGE 1.20	630	VWWSR
48 HARVEY ST	020-001-069-000	1 FAM HOUSE GARAGE .32A	210	VWWSR
265 MT PLEASANT ST	020-001-062-000	3 APT. HOUSE .24A	630	VWWSR
283 OVERCLIFF RD	020-001-083-000	1 FAM HOUSE 1.02A	210	VWWSR
238 MT PLEASANT ST	020-001-058-000	2 APT HOUSE GARAGE .44A	420	VWWSR
34 HARVEY ST	020-001-067-000	1 FAM HOUSE .08 A	210	VWWSR
46 WESLEY DR	020-001-054-000	2 APT. HOUSE GARAGE 0.39	420	VWWSR
283 OVERCLIFF RD	020-001-082-000	1 FAM HOUSE 1.02A	210	VWWSR
24 HARVEY ST	020-001-065-000	2 FAM HOUSE. .08 A	420	VWWSR
83 HARVEY ST	020-001-074-000	1 FAM HOUSE .14A	210	VWWSR
89 HARVEY ST	020-001-076-000	1 FAM HOUSE .48A	210	VWWSR
63 HARVEY ST	020-001-071-000	1 FAM HOUSE .23A	210	VWWSR
129 HARVEY ST	020-001-079-000	1 FAM HOUSE .67A	210	VWWSR
206 MT PLEASANT ST	020-001-057-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
457 CLIFF ST	020-001-063-000	4 APT. HOUSE .15A	840	VWWSR
41 HARVEY ST	020-001-068-000	1 FAM HOUSE .10A	210	VWWSR
186 MT PLEASANT ST	020-001-056-000	2 APT HOUSE GARAGE .33A	420	VWWSR
253 OVERCLIFF RD	010-000-087-000	1 FAM HOUSE 0.905A	210	VWWSR
29 HARVEY ST	020-001-066-000	1 FAM HOUSE .10A	210	VWWSR
93 LYNWOOD TER	020-001-070-000	1 FAM HOUSE GARAGE .33A	210	VWWSR
452 CLIFF ST	020-001-059-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
439 CLIFF ST	020-001-064-000	1 FAM HOUSE GARAGE .23	210	VWWSR
168 MT PLEASANT ST	023-002-020-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
96 LYNWOOD TER	023-001-017-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
77 LYNWOOD TER	023-001-011-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
187 OVERCLIFF RD	023-001-001-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
227 MT PLEASANT ST	023-002-007-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
253 WEBSTER ST	023-001-005-000	HOUSE 2 APT. GARAGE .741 A	420	VWWSR
427 CLIFF ST	023-001-018-000	1 FAM HOUSE .20A	210	VWWSR
209 MT PLEASANT ST	023-002-008-000	3 APT. HOUSE GARAGE .15A	630	VWWSR
158 MT PLEASANT ST	023-002-021-000	HOUSE 2 APT. .17A	420	VWWSR
253 WEBSTER ST	023-001-006-001	HOUSE 2 APT. GARAGE .741 A	420	VWWSR
436 CLIFF ST	023-002-006-000	4 UNIT APT HOUSE 0.15	840	VWWSR
199 MT PLEASANT ST	023-002-009-000	3 APT HOUSE GARAGE .15A	630	VWWSR
80 LYNWOOD TER	023-001-016-000	1 FAM HOUSE DECK .16A	210	VWWSR
57 LYNWOOD TER	023-001-010-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
417 CLIFF ST	023-001-019-000	2 APT HOUSE 0.23	420	VWWSR
19 LYNWOOD TER	023-001-006-000	1 FAM HOUSE GARAGE .818A	210	VWWSR
179 MT PLEASANT ST	023-002-019-000	1 FAM HOUSE GARAGE .46A	210	VWWSR
423 SPRING ST	023-002-010-000	4 APT. HOUSE .19A	840	VWWSR
424 CLIFF ST	023-002-005-000	2 APT HOUSE 0.17	420	VWWSR
66 LYNWOOD TER	023-001-015-000	1 FAM HOUSE DECK .15A	210	VWWSR
401 CLIFF ST	023-001-020-000	HOUSE 2 APT UNITS .23	420	VWWSR
141 MT PLEASANT ST	023-002-023-000	1 FAMILY HOUSE 0.27	210	VWWSR
407 SPRING ST	023-002-011-000	3 APT. HOUSE GARAGE .25A	630	VWWSR
39 LYNWOOD TER	023-001-009-000	1 FAM HOUSE .16A	210	VWWSR
412 CLIFF ST	023-002-004-000	1 FAM HOUSE GARAGE .14A	210	VWWSR
231 WEBSTER ST	023-001-004-000	1 FAM HOUSE .08A	210	VWWSR
389 CLIFF ST	023-001-021-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
46 LYNWOOD TER	023-001-014-000	1 FAM HOUSE .15A	210	VWWSR
399 SPRING ST	023-002-012-000	HOUSE 2 APT. GARAGE .26A	420	VWWSR
414 SPRING ST	023-002-018-000	1 FAM HOUSE GARAGE .10A	210	VWWSR
649 SUMMER ST	023-002-024-000	HOUSE 2 APT. GARAGE .19A	420	VWWSR
400 CLIFF ST	023-002-003-000	3 APT. HOUSE GARAGE .15A	630	VWWSR
639 SUMMER ST	023-002-025-000	HOUSE 2 APT. GARAGE 0.27	420	VWWSR
215 WEBSTER ST	023-001-003-000	1 FAM HOUSE GARAGE .47A	210	VWWSR
400 SPRING ST	023-002-017-000	HOUSE OFFICE GARAGE .28	210	VWWSR
377 CLIFF ST	023-001-022-000	1 FAM HOUSE .22A	210	VWWSR
381 SPRING ST	023-002-013-000	1 FAM HOUSE .11A	210	VWWSR
192 WEBSTER ST	023-001-007-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
36 LYNWOOD TER	023-001-013-000	1 FAM HOUSE .15A	210	VWWSR

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
386 CLIFF ST	023-002-002-000	3 APT HOUSE .15A	630	VWWSR
385 SPRING ST	023-002-014-000	3 APT. HOUSE GARAGE .15A	630	VWWSR
186 OVERCLIFF RD	023-001-035-000	1 FAM HOUSE 1.08A	210	VWWSR
640 SUMMER ST	023-002-027-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
627 SUMMER ST	023-002-026-000	HOUSE 2 APT. GARAGE .30A	420	VWWSR
363 CLIFF ST	023-001-023-000	HOUSE - 2 APT UNITS 0.23 A	420	VWWSR
384 SPRING ST	023-002-016-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
164 WEBSTER ST	023-001-012-000	1 FAM HOUSE GARAGE DECK .23A	210	VWWSR
373 SPRING ST	023-002-015-000	4 APT. HOUSE GARAGE .25A	840	VWWSR
370 CLIFF ST	023-002-001-000	3 FAM HOUSE GARAGE .26A	630	VWWSR
203 WEBSTER ST	023-001-002-000	3 APT. HOUSE .28A	630	VWWSR
613 SUMMER ST	023-002-053-000	HOUSE 2 APT. GARAGE .34A	420	VWWSR
349 CLIFF ST	023-001-024-000	2 APT HOUSE GARAGE .22A	420	VWWSR
187 OVERCLIFF RD	023-001-034-001	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
626 SUMMER ST	023-002-052-000	3 APT. HOUSE .19A	630	VWWSR
359 SPRING ST	023-002-063-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
374 SPRING ST	023-002-062-000	HOUSE GARAGE .26A	210	VWWSR
169 WEBSTER ST	023-001-033-000	3 APT. HOUSE .24A	630	VWWSR
352 CLIFF ST	023-002-068-000	2 APT HOUSE GARAGE .27A	420	VWWSR
289 CLIFF ST	023-001-028-000	1 FAM HOUSE 1.30A	210	VWWSR
606 SUMMER ST	023-002-051-000	4 APT. HOUSE GARAGE .23A	840	VWWSR
593 SUMMER ST	023-002-054-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
145 WEBSTER ST	023-001-032-000	1 FAM HOUSE .14A	210	VWWSR
187 OVERCLIFF RD	023-001-037-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
356 SPRING ST	023-002-061-000	1 FAM HOUSE GARAGE .28A	210	VWWSR
339 SPRING ST	023-002-064-000	1 FAM HOUSE .26A	210	VWWSR
327 CLIFF ST	023-001-025-000	2 APT HOUSE GARAGE .17A	420	VWWSR
577 SUMMER ST	023-002-055-000	3 APT. HOUSE GARAGE .28A	630	VWWSR
594 SUMMER ST	023-002-050-000	1 FAM HOUSE .12A	210	VWWSR
324 CLIFF ST	023-002-069-000	2 APT HOUSE .25A	420	VWWSR
315 CLIFF ST	023-001-026-000	2 APT HOUSE GARAGE .21A	420	VWWSR
48 WEBSTER ST	023-002-060-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
187 OVERCLIFF RD	023-001-039-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
584 SUMMER ST	023-002-049-000	1 FAM HOUSE GARAGE .12 A	210	VWWSR
77 WEBSTER ST	023-002-065-000	HOUSE 2 APT. .25A	420	VWWSR
187 OVERCLIFF RD	023-001-040-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
301 CLIFF ST	023-001-027-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
561 SUMMER ST	023-002-056-000	HOUSE 2 APT. GARAGE .28	420	VWWSR
316 CLIFF ST	023-002-070-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
570 SUMMER ST	023-002-048-000	HOUSE 2 APT .14A	420	VWWSR
316 SPRING ST	023-002-059-000	4 APT. HOUSE GARAGE .24A	840	VWWSR
301 SPRING ST	023-002-066-000	1 FAM HOUSE .19A	210	VWWSR
576 SUMMER ST	023-002-046-000	1 FAM HOUSE .16A	210	VWWSR
300 CLIFF ST	023-002-071-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
535 SUMMER ST	023-002-057-000	HOUSE 2 APT. .32A	420	VWWSR
550 SUMMER ST	023-002-047-000	HOUSE 2 APT. .28A	420	VWWSR
187 OVERCLIFF RD	023-001-038-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
291 SPRING ST	023-002-067-000	HOUSE 2 APT. .20	420	VWWSR
277 CLIFF ST	023-001-029-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
304 SPRING ST	023-002-058-000	5 APT HOUSE .31	1050	VWWSR
288 CLIFF ST	023-002-072-000	1 FAM HOUSE .21A	210	VWWSR
525 SUMMER ST	023-002-083-000	1 FAM HOUSE FUNERAL HOME .38A	210	VWWSR
183 OVERCLIFF RD	023-001-043-000	1 FAM HOUSE .28A	210	VWWSR
279 SPRING ST	023-002-077-000	LAND ONLY .18 A	0	VWWSR
265 CLIFF ST	023-001-030-000	1 FAM HOUSE .21	210	VWWSR
536 SUMMER ST	023-002-084-000	1 FAM HOUSE .20A	210	VWWSR
270 CLIFF ST	023-002-073-000	1 FAM HOUSE .21A	210	VWWSR
286 SPRING ST	023-002-078-000	3 APT. HOUSE .14A	630	VWWSR
84 OVERCLIFF RD	023-001-031-000	1 FAM HOUSE GARAGE (2 LOTS) .83A	210	VWWSR
261 SPRING ST	023-002-076-000	1 FAMILY HOUSE .22A	210	VWWSR
481 SUMMER ST	023-002-082-000	UNFINISHED OFFICE BLDG 1.10 A	125	WATER METER INFO
522 SUMMER ST	023-002-085-000	HOUSE 2 APT .21A	420	VWWSR
210 WINTER ST	023-002-074-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
187 OVERCLIFF RD	023-001-042-000	1 FAM HOUSE GREENHOUSE POOL 21.82 A	210	VWWSR
14 SHADOW DR	023-001-045-000	1 FAM HOUSE GARAGE 1.26	210	VWWSR
268 SPRING ST	023-002-079-000	HOUSE 2 APT. GARAGE .15A	420	VWWSR
14 SHADOW DR	023-001-046-000	1 FAM HOUSE GARAGE 1.26	210	VWWSR
247 SPRING ST	023-002-075-000	1 FAM HOUSE .24A	210	VWWSR
506 SUMMER ST	023-002-086-001	SCHOOL 1.40	80	WATER METER INFO
258 SPRING ST	023-002-080-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
211 WINTER ST	023-004-003-000	LAND ONLY .31 A	0	VWWSR
14 SHADOW DR	023-001-047-000	1 FAM HOUSE GARAGE 1.26	210	VWWSR

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
246 SPRING ST	023-002-081-000	1 FAM HOUSE .09A	210	VWWSR
282 US RTE 2B	022-000-009-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
258 US RTE 2B	022-000-010-000	1 FAM HOUSE GARAGE .75A	210	VWWSR
193 WINTER ST	023-004-004-000	1 FAM HOUSE .09A	210	VWWSR
294 US RTE 2B	022-000-008-000	1 FAM HOUSE .20A	210	VWWSR
318 US RTE 2B	022-000-007-000	1 FAM HOUSE SHEDS .92A	210	VWWSR
231 SPRING ST	023-004-005-000	3 APT. HOUSE GARAGE .18A	630	VWWSR
222 CLIFF ST	023-004-002-000	4 FAM HOUSE 0.25	840	VWWSR
226 SPRING ST	023-004-008-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
10 UNDERCLYFFE RD	023-001-048-000	1 FAM HOUSE GARAGE 1.27A	210	VWWSR
50 SHADOW DR	023-001-055-000	1 FAM HOUSE .46 A	210	VWWSR
225 SPRING ST	023-004-006-000	HOUSE .06A	210	VWWSR
141 WINTER ST	023-004-010-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
0 SPRING ST	023-004-007-000	LAND ONLY .20A	0	VWWSR
451 SUMMER ST	023-004-011-000	HOUSE 3 APT. GARAGE .23A	630	VWWSR
206 CLIFF ST	023-004-001-000	2 APT HOUSE GARAGE .25A	420	VWWSR
214 SPRING ST	023-004-009-000	1 FAM HOUSE .13A	210	VWWSR
185 SPRING ST	023-004-031-000	3 APT. HOUSE GARAGE .25A	630	VWWSR
431 SUMMER ST	023-004-021-000	1 FAM HOUSE GARAGE .33A	210	VWWSR
10 UNDERCLYFFE RD	023-001-049-000	1 FAM HOUSE GARAGE 1.27A	210	VWWSR
448 SUMMER ST	023-004-017-000	APT HOUSE 6 UNITS .31 A	1260	VWWSR
202 SPRING ST	023-004-027-000	1 FAM HOUSE .16A	210	VWWSR
188 CLIFF ST	023-004-038-000	1 FAM HOUSE DECK .21A	210	VWWSR
81 WINTER ST	023-004-016-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
10 UNDERCLYFFE RD	023-001-050-000	1 FAM HOUSE GARAGE 1.27A	210	VWWSR
69 WINTER ST	023-004-015-000	1 FAM HOUSE .20 A	210	VWWSR
421 SUMMER ST	023-004-022-000	LAW OFFICES GARAGE .61A	420	VWWSR
171 SPRING ST	023-004-032-000	1 FAM HOUSE DECK .21A	210	VWWSR
307 US RTE 2B	022-000-015-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
293 US RTE 2B	022-000-014-000	HOUSE 2 APT. GARAGE 0.48	420	VWWSR
273 US RTE 2B	022-000-013-000	1 FAM HOUSE GARAGE .17A	210	VWWSR
325 US RTE 2B	022-000-016-000	1 FAM HOUSE GARAGE .10A	210	VWWSR
188 SPRING ST	023-004-028-000	3 APT. HOUSE .17A	630	VWWSR
1375 MAIN ST	023-004-012-000	CHURCH & RECTORY .98	110	WATER METER INFO
72 SHADOW DR	023-001-054-000	1 FAM HOUSE GARAGE .44A	210	VWWSR
174 CLIFF ST	023-004-039-000	1 FAM HOUSE GARAGE .10A	210	VWWSR
257 US RTE 2B	022-000-012-000	1 FAM HOUSE GARAGE .15A	210	VWWSR
18 WOODS RD	023-001-058-000	HOUSE 2.33	210	VWWSR
10 UNDERCLYFFE RD	023-001-051-000	1 FAM HOUSE GARAGE 1.27A	210	VWWSR
198 CHURCH ST	023-004-040-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
426 SUMMER ST	023-004-018-000	HOUSE 7 APT GARAGE .33A	1470	VWWSR
163 SPRING ST	023-004-033-000	1 FAM HOUSE .16A	210	VWWSR
176 SPRING ST	023-004-029-000	2 APT. HOUSE .17A	420	VWWSR
162 CLIFF ST	023-004-041-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
10 UNDERCLYFFE RD	023-001-052-000	1 FAM HOUSE GARAGE 1.27A	210	VWWSR
401 SUMMER ST	023-004-023-000	HOUSE 2 APT. GARAGE .30A	420	VWWSR
184 CHURCH ST	023-004-037-000	1 FAM HOUSE GARAGE .13A	210	VWWSR
416 SUMMER ST	023-004-019-000	1 FAM HOUSE .37A	210	VWWSR
154 CHURCH ST	023-004-030-000	HOUSE 2 APT. .31A	420	VWWSR
170 CHURCH ST	023-004-034-000	1 FAM HOUSE .12A	210	VWWSR
35 STEEPLE PL	023-004-014-000	1 FAM HOUSE .21A	210	VWWSR
40 UNDERCLYFFE RD	023-001-053-000	1 FAM HOUSE .37A	210	VWWSR
134 CHURCH ST	023-004-026-000	3 FAM. HOUSE GARAGE .32	630	VWWSR
215 UNDERCLYFFE RD	023-001-059-000	1 FAM HOUSE GARAGE 1.00A	210	VWWSR
24 STEEPLE PL	023-004-013-000	5 APT HOUSE .49	1050	VWWSR
265 UNDERCLYFFE RD	023-001-057-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
406 SUMMER ST	023-004-020-000	1 FAM HOUSE GARAGE .30A	210	VWWSR
389 SUMMER ST	023-004-024-000	3 APT HOUSE GARAGE .13A	630	VWWSR
267 UNDERCLYFFE RD	023-001-056-000	1 FAM HOUSE GARAGE .26A	210	VWWSR
130 CLIFF ST	023-004-042-000	1 FAM HOUSE .35A	210	VWWSR
187 CHURCH ST	023-004-036-000	1 FAM HOUSE GARAGE .20A	210	VWWSR
56 CHURCH ST	023-004-067-000	DOCTORS OFFICE 2 APTS .38A	420	VWWSR
114 CHURCH ST	023-004-025-000	3 APT. HOUSE CARPORT .21A	630	VWWSR
380 SUMMER ST	023-004-065-000	8 APARTMENT HOUSE .38A	1680	VWWSR
125 SPRING ST	023-004-035-000	1 FAM HOUSE .17A	210	VWWSR
1325 MAIN ST	023-004-068-000	CHURCH 1.1A	260	WATER METER INFO
64 CHURCH ST	023-004-066-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
157 CHURCH ST	023-004-053-000	1 FAM HOUSE GARAGE .31A	210	VWWSR
101 CLIFF ST	023-001-076-000	1 FAM HOUSE .16A	210	VWWSR
101 CLIFF ST	023-001-077-000	1 FAM HOUSE .16A	210	VWWSR
116 CLIFF ST	023-004-043-000	1 FAM HOUSE .18A	210	VWWSR
67 UNDERCLYFFE RD	023-001-075-000	1 FAM HOUSE GARAGE .29A	210	VWWSR

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
139 CHURCH ST	023-004-055-000	1 FAM HOUSE GARAGE .34A	210	VWWSR
244 UNDERCLYFFE RD	023-001-063-000	1 FAM HOUSE .22A	210	VWWSR
80 UNDERCLYFFE RD	023-001-067-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
203 UNDERCLYFFE RD	022-000-021-000	1 FAM HOUSE GARAGE .45A	210	VWWSR
101 SPRING ST	023-004-048-000	1 FAM HOUSE .19A	210	VWWSR
87 CLIFF ST	023-001-078-000	1 FAM HOUSE .16A	210	VWWSR
67 UNDERCLYFFE RD	023-001-074-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
102 CLIFF ST	023-004-047-000	1 FAM HOUSE .18A	210	VWWSR
113 CHURCH ST	023-004-059-000	2 FAM HOUSE .24A	420	VWWSR
218 UNDERCLYFFE RD	023-001-062-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
98 UNDERCLYFFE RD	023-001-066-000	1 FAM HOUSE GARAGE .25A	210	VWWSR
81 SPRING ST	023-004-049-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
73 CLIFF ST	023-001-079-000	1 FAM HOUSE .16A	210	VWWSR
85 UNDERCLYFFE RD	023-001-073-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
92 CLIFF ST	023-004-046-000	1 FAM HOUSE .20A	210	VWWSR
340 SUMMER ST	023-004-063-000	9 UNIT APT .2A	1890	VWWSR
98 SPRING ST	023-004-052-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
331 SUMMER ST	023-004-058-000	MEDICAL OFFICE .30A	30	WATER METER INFO
191 UNDERCLYFFE RD	023-001-061-000	1 FAM HOUSE .74 A	210	VWWSR
77 CHURCH ST	023-004-064-000	1 FAM HOUSE .13A	210	VWWSR
55 CLIFF ST	023-001-080-000	1 FAM HOUSE .32A	210	VWWSR
85 UNDERCLYFFE RD	023-001-072-000	1 FAM HOUSE GARAGE .27A	210	VWWSR
65 CHURCH ST	023-004-069-000	3 APT. HOUSE .38A	630	VWWSR
78 CLIFF ST	023-004-045-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
114 UNDERCLYFFE RD	023-001-065-000	1 FAM HOUSE GARAGE .23A	210	VWWSR
140 CENTRAL ST	023-004-051-000	1 FAM HOUSE GARAGE .29A	210	VWWSR
99 UNDERCLYFFE RD	023-001-071-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
53 CHURCH ST	023-004-070-000	5 APT HOUSE .16A	1050	VWWSR
54 CLIFF ST	023-004-044-000	1 FAM HOUSE .34	210	VWWSR
311 SUMMER ST	023-004-057-000	1 FAM HOUSE .34A	210	VWWSR
41 CHURCH ST	023-004-071-000	1 FAM HOUSE .14A	210	VWWSR
78 CLIFF ST	023-004-050-000	1 FAM HOUSE GARAGE .09A	210	VWWSR
126 CENTRAL ST	023-004-054-000	1 FAM HOUSE .26A	210	VWWSR
322 SUMMER ST	023-004-062-000	HOUSE 3 APT .07A	630	VWWSR
84 CENTRAL ST	023-004-060-000	WAREHHOUSE STORAGE BLD .81	170	WATER METER INFO
138 UNDERCLYFFE RD	023-001-064-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
27 CLIFF ST	023-001-081-000	1 FAM HOUSE 1.36 A	210	VWWSR
117 UNDERCLYFFE RD	023-001-070-000	1 FAM HOUSE .16A	210	VWWSR
297 SUMMER ST	023-004-056-000	OFFICE & CONFERENCE BLDG. .31A	275	WATER METER INFO
27 CLIFF ST	023-001-082-000	1 FAM HOUSE 1.36 A	210	VWWSR
163 UNDERCLYFFE RD	023-001-060-000	1 FAM HOUSE .20A	210	VWWSR
133 UNDERCLYFFE RD	023-001-069-000	1 FAM HOUSE .16A	210	VWWSR
43 SPRING ST	023-006-002-000	1 FAM HOUSE .10A	210	VWWSR
37 SPRING ST	023-006-001-000	1 FAM HOUSE .14A	210	VWWSR
159 CENTRAL ST	023-006-003-000	3 FAM HOUSE GARAGE .17A	630	VWWSR
138 UNDERCLYFFE RD	023-001-064-000	1 FAM HOUSE GARAGE .22A	210	VWWSR
36 KNOLLWOOD TER	022-000-023-000	1 FAM HOUSE GARAGE .35A	210	VWWSR
25 SPRING ST	023-006-017-000	HOUSE GARAGE .33A	210	VWWSR
27 CLIFF ST	023-001-083-000	1 FAM HOUSE 1.36 A	210	VWWSR
147 CENTRAL ST	023-006-004-000	3 APT HOUSE .08A	420	VWWSR
139 CENTRAL ST	023-006-009-000	3 APT HOUSE .15A	630	VWWSR
110 DEER AVE	022-000-033-000	HOUSE 5.20	210	VWWSR
231 CENTRAL ST	023-006-019-000	2 FAM HOUSE .28A	420	VWWSR
129 CENTRAL ST	023-006-005-000	2 APT HOUSE .18A	420	VWWSR
277 SUMMER ST	023-006-006-000	4 APT. HOUSE .2A	840	VWWSR
32 SPRING ST	023-006-014-000	1 FAM HOUSE GARAGE .07A	210	VWWSR
27 CLIFF ST	023-001-084-000	1 FAM HOUSE 1.36 A	210	VWWSR
15 SPRING ST	023-006-018-000	1 FAM HOUSE .17A	210	VWWSR
18 SPRING ST	023-006-015-000	HOUSE 2 APT .14A	420	VWWSR
54 KNOLLWOOD TER	022-000-026-000	1 FAM HOUSE GARAGE .60A	210	VWWSR
49 KNOLLWOOD TER	022-000-024-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
141 CENTRAL ST	023-006-010-000	1 FAM HOUSE .06A	210	VWWSR
270 SUMMER ST	023-007-006-001	10 UNIT APT HOUSE 0.17	2100	VWWSR
253 CENTRAL ST	023-006-026-000	1 FAM HOUSE .15A	210	VWWSR
253 SUMMER ST	023-006-008-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
261 SUMMER ST	023-006-007-000	3 FAM HOUSE 0.13A	630	VWWSR
69 CENTRAL ST	023-007-005-000	4 FAM HOUSE .13A	840	VWWSR
26 AUTUMN ST	023-006-023-000	1 FAM HOUSE SHED .27A	210	VWWSR
271 CENTRAL ST	023-006-027-000	3 FAM HOUSE .23A	630	VWWSR
8 SPRING ST	023-006-016-000	1 FAM HOUSE .19A	210	VWWSR
241 SUMMER ST	023-006-011-000	3 APT. HOUSE .18A	630	VWWSR
254 SUMMER ST	023-007-007-000	1 FAM HOUSE GARAGE .30A	210	VWWSR

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
37 AUTUMN ST	023-006-022-000	1 FAM HOUSE CARPORT .20A	210	VWWSR
27 CLIFF ST	023-001-087-000	1 FAM HOUSE 1.36 A	210	VWWSR
283 CENTRAL ST	023-006-028-000	1 FAM HOUSE .22A	210	VWWSR
1207 MAIN ST	023-007-001-000	ST JOHNSBURY HOUSE 39 APT. BLDG .56	8190	VWWSR
0 WESTERN AVE	022-000-040-000	LAND ONLY 7.0	0	VWWSR
225 SUMMER ST	023-006-012-000	HOUSE 2 APT. GARAGE .18A	420	VWWSR
82 US RTE 2 W	022-000-030-000	1 FAM HOUSE 1.80A	210	VWWSR
223 SUMMER ST	023-006-013-000	4 APT HOUSE .28A	840	VWWSR
0 WESTERN AVE	022-000-040-000	LAND ONLY 7.0	0	VWWSR
1187 MAIN ST	023-007-003-000	TOWN MUNICIPAL BUILDING .8	310	WATER METER INFO
121 FOREST AVE	023-006-032-000	3 APT HOUSE .33A	630	VWWSR
104 DEER AVE	022-000-032-000	HOUSE 0.23	210	VWWSR
177 HIGHLAND AVE	023-006-024-000	1 FAM HOUSE GARAGE .24A	210	VWWSR
50 AUTUMN ST	023-006-020-000	1 FAM HOUSE CARPORT .13A	210	VWWSR
124 DEER AVE	022-000-034-000	HOUSE GARAGE 0.33	210	VWWSR
91 BRIGHTLOOK DR	023-006-048-000	APARTMENT HOUSE- 18 UNITS 1.8 A	3780	VWWSR
240 SUMMER ST	023-007-008-000	3 APT. HOUSE .3A	630	VWWSR
362 CENTRAL ST	022-000-025-000	1 FAM HOUSE .18A	210	VWWSR
99 FOREST AVE	023-006-030-000	1 FAM HOUSE .51A (3 LOTS)	210	VWWSR
149 HIGHLAND AVE	023-006-025-000	1 FAM HOUSE .47A	210	VWWSR
343 CENTRAL ST	023-006-033-000	1 FAM HOUSE .3A	210	VWWSR
79 KNOLLWOOD TER	022-000-027-000	1 FAM HOUSE GARAGE .50A	210	VWWSR
172 HIGHLAND AVE	023-006-021-000	1 FAM HOUSE .17A	210	VWWSR
99 FOREST AVE	023-006-035-000	1 FAM HOUSE .51A (3 LOTS)	210	VWWSR
68 US RTE 2 W	022-000-029-000	HOUSE 2 APT. .27A	420	VWWSR
222 SUMMER ST	023-007-009-000	HOUSE 2 APT. OFFICE GARAGE .52A	420	VWWSR
90 DEER AVE	022-000-031-000	HOUSE CAR PORT 0.34	210	VWWSR
1197 MAIN ST	023-007-002-000	OFFICE BLDG. .19 A	255	WATER METER INFO
42 US RTE 2 W	022-000-028-000	HOUSE- 2 APARTMENT 0.49	420	VWWSR
0 WESTERN AVE	023-006-034-000	VACANT LOT 1.70	0	VWWSR
176 WESTERN AVE	023-007-013-000	BUILDING 1.4 WATER DEPT	0	VWWSR
85 FOREST AVE	023-006-036-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
208 SUMMER ST	023-007-010-000	1 FAM HOUSE GARAGE .18A	210	VWWSR
144 HIGHLAND AVE	023-006-046-000	1 FAM HOUSE GARAGE .71A	210	VWWSR
1171 MAIN ST	023-007-014-000	ATHENAEUM LIBRARY .56	110	WATER METER INFO
192 SUMMER ST	023-007-012-000	1 FAM HOUSE BARN 1.64A	210	VWWSR
0 WESTERN AVE	022-000-041-000	LAND ONLY .23	0	VWWSR
77 FOREST AVE	023-006-037-000	1 FAM HOUSE .22A	210	VWWSR
102 HIGHLAND AVE	023-006-045-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
1153 MAIN ST	023-007-015-000	POST OFFICE 1.25	255	WATER METER INFO
102 HIGHLAND AVE	023-006-041-000	1 FAM HOUSE GARAGE .51A	210	VWWSR
166 SUMMER ST	023-007-011-000	1 FAM HOUSE .42A	210	VWWSR
43 FOREST AVE	023-006-038-000	1 FAM HOUSE .16A	210	VWWSR
62 HIGHLAND AVE	023-006-040-000	3 HOUSES 1.85A (2-1 FAM & 1-2 FAM)	840	VWWSR
62 HIGHLAND AVE	023-006-043-000	3 HOUSES 1.85A (2-1 FAM & 1-2 FAM)	840	VWWSR
119 SUMMER ST	023-006-052-000	1 FAM HOUSE GARAGE 1.00A	210	VWWSR
149 SUMMER ST	023-006-051-000	1 FAM HOUSE .18A	210	VWWSR
1129 MAIN ST	023-007-016-000	OFFICE BUILDING 0.38	135	WATER METER INFO
15 FOREST AVE	023-006-039-000	1 FAM HOUSE GARAGE .19A	210	VWWSR
118 WESTERN AVE	023-007-058-000	ELK'S LODGE 2.82	210	WATER METER INFO
130 SUMMER ST	023-007-062-000	1 FAM HOUSE GARAGE 2.54A	210	VWWSR
1111 MAIN ST	023-007-017-000	COMMERCIAL BLDG. 2 APT. 0.30	420	VWWSR
174 WESTERN AVE	023-007-060-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
1107 MAIN ST	023-007-018-000	COMMERCIAL BLDG 0.07	390	WATER METER INFO
105 SUMMER ST	023-006-053-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
37 HIGHLAND AVE	023-006-055-000	1 FAM HOUSE GARAGE .21A	210	VWWSR
1097 MAIN ST	023-007-051-000	OFFICE BUILDING 0.13	20	WATER METER INFO
15 HIGHLAND AVE	023-006-054-000	1 FAM HOUSE .15A	210	VWWSR
1089 MAIN ST	023-007-052-000	HOUSE 3 APTS GARAGE 0.27	630	VWWSR
160 WESTERN AVE	023-007-059-000	CAR WASH SERVICE STATION 0.50	1070	WATER METER INFO
1071 MAIN ST	023-007-053-000	1 FAM HOUSE .15A	210	VWWSR
24 DAY CT	023-007-054-000	1 FAM HOUSE GARAGE .12A	210	VWWSR
38 DAY CT	023-007-057-000	1 FAM HOUSE GARAGE .44A	210	VWWSR
2 WESTERN AVE	023-007-055-000	OFFICE & MAINTENANCE BLDG .20A	680	WATER METER INFO
54 WESTERN AVE	023-007-056-000	VETERINARY CLINIC .37A	150	WATER METER INFO
161 WESTERN AVE	026-001-004-000	OFFICE BUILDING 0.48	310	WATER METER INFO
1007 MAIN ST	026-001-012-000	STREETER HALL SCHOOL 2.5	7200	WATER METER INFO
1009 MAIN ST	026-001-015-000	CHARLOTTE FAIRBANKS COTTAGE OFFICE .4	250	WATER METER INFO
985 MAIN ST	026-001-016-000	GIRLS DORMITORY .3	480	WATER METER INFO
70 FAIRBANKS DR	026-001-014-000	LIBRARY .57A	1235	WATER METER INFO
90 FAIRBANKS DR	026-001-013-000	GIRLS DORMITORY .43	315	WATER METER INFO
85 FAIRBANKS DR	026-001-019-000	1 FAM HOUSE 1.00A	760	METERING DATA

Appendix A
Table 14 - CSO 027
Contributing Wastewater Flows

STREET LOCATION	PARCEL NUMBER	DESCRIPTION	ESTIMATED AVERAGE DAILY FLOW (GPD)	SOURCE
67 FAIRBANKS DR	026-001-018-000	DORMITORY .49	1050	WATER METER INFO
Total Contributing Average Daily Flow			**137405**	**GPD**

Appendix B

2019-2020 Wastewater Department Budget

DUFRESNE GROUP
CONSULTING ENGINEERS

2019-20 Sewer Budget

SEWER FUND REVENUES

Sewer Fund	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
Sewage Disp Chgs Mtered	$ 1,458,123	**$ 1,488,829**	$ 1,480,925	**$ 1,495,000**	$ 1,515,000	**$ 1,545,000**	3.34%
State & Federal Grants	$ 25,640		$ 637,626	**$ -**	$ 250,000	**$ -**	0.00%
Miscellaneous						**$ -**	0.00%
Interest & Dividends	$ 151	**$ 49**	$ 436	**$ 350**	$ 360	**$ 350**	0.00%
From Reserves						**$ 55,000**	100.00%
Interest Penalties	$ 8,696	**$ 5,500**	$ 3,688	**$ 4,000**	$ 4,000	**$ 4,000**	0.00%
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	$ 1,492,610	**$ 1,494,378**	$ 2,122,675	**$ 1,499,350**	$ 1,769,360	**$ 1,604,350**	7.00%

EXPENSE SUMMARY

Sewer Fund Expenses	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
Sewer Administration	$ 56,500	**$ 56,500**	$ 56,500	**$ 56,500**	$ 56,500	**$ 56,500**	0.00%
Sewer Collection	$ 127,053	**$ 121,457**	$ 100,577	**$ 108,687**	$ 88,637	**$ 155,640**	43.20%
Sewer Plant	$ 750,881	**$ 791,564**	$ 761,887	**$ 794,400**	$ 830,550	**$ 822,934**	3.59%
Sewer Fund	$ 290,126	**$ 523,857**	$ 484,429	**$ 539,763**	$ 439,620	**$ 526,214**	-2.51%
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Total Sewer Fund Expenses	$ 1,224,560	**$ 1,493,378**	$ 1,403,393	**$ 1,499,350**	$ 1,415,307	**$ 1,561,288**	4.13%

SEWER FUND EXPENSES

SEWER ADMINISTRATION	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
Manager's Office Expense	$ 17,500	**$ 17,500**	$ 17,500	**$ 17,500**	$ 17,500	**$ 17,500**	0.00%
Clerk's Office Expense	$ 39,000	**$ 39,000**	$ 39,000	**$ 39,000**	$ 39,000	**$ 39,000**	0.00%
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	$ 56,500	**$ 56,500**	$ 56,500	**$ 56,500**	$ 56,500	**$ 56,500**	0.00%

SEWER COLLECTION	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
Transfer To Highway Fund	$ 47,066	**$ 47,066**	$ 47,066	**$ 47,066**	$ 47,066	**$ 47,066**	0.00%
Office Supplies	$ 212	**$ 250**	$ 130	**$ 250**	$ 200	**$ 250**	0.00%
Postage	$ 1,987	**$ 2,000**	$ 1,990	**$ 2,000**	$ 2,000	**$ 2,000**	0.00%
Advertising	$ -	**$ 100**	$ -	**$ 100**	$ -	**$ 100**	0.00%
New Equipment	$ 2,896		$ -		$ -	**$ 55,000**	100.00%
Small Tools	$ -	**$ 2,500**	$ -	**$ 1,000**	$ 500	**$ 500**	-50.00%
Gas, Oil & Mileage	$ -	**$ 2,000**	$ -	**$ 2,000**	$ -		-100.00%
Public Utility Services	$ 18,591	**$ 16,500**	$ 16,834	**$ 16,500**	$ 12,500	**$ 12,500**	-24.24%
Sewer Parts	$ 4,909	**$ 10,700**	$ 4,062	**$ 8,200**	$ 5,000	**$ 10,700**	30.49%
Contracted Services	$ 14,942	**$ 17,500**	$ 8,220	**$ 20,000**	$ 10,000	**$ 27,124**	35.62%
Contracted Services/Sewer Main	$ 5,958.00	$ -	$ -		$ -		0.00%
1272 Study		**$ -**	$ -	**$ -**	$ -		0.00%
Westside Project		**$ -**	$ -	**$ -**	$ -		0.00%
CSO-Eastern, MAIN, Western		**$ -**	$ -	**$ -**	$ -		0.00%
Va-Con Truck Principal	$ 21,364	**$ 21,793**	$ 21,793	**$ 11,060**	$ 11,060	**$ -**	-100.00%
Va-Con Truck Interest	$ 780	**$ 548**	$ 350	**$ 111**	$ 111	**$ -**	-100.00%
Repair & Maint Services	$ 8,339	**$ -**					0.00%
Operating Supplies	$ 9	**$ 500**	$ 132	**$ 400**	$ 200	**$ 400**	0.00%
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	$ 127,053	**$ 121,457**	$ 100,577	**$ 108,687**	$ 88,637	**$ 155,640**	43.20%
SEWER PLANT	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
New Equipment	$ 8,405	**$ 12,700**	$ 21,310	**$ 12,500**	$ 46,566	**$ 55,000**	340.00%
Small Tools	$ 13,235	**$ 13,000**	$ 1,290	**$ 4,500**	$ -	**$ 15,000**	233.33%
Public Utility Services	$ 77,677	**$ 90,000**	$ 84,470	**$ 80,000**	$ 78,069	**$ 80,000**	0.00%
Fuel Oil/Heating	$ -	**$ -**	$ -	**$ 4,800**	$ -	**$ 1,000**	-79.17%
Waste Disposal Services	$ 10,482	**$ 14,000**	$ 11,631	**$ 13,000**	$ 27,819	**$ 13,000**	0.00%
Contracted Services	$ 580,256	**$ 597,464**	$ 591,313	**$ 599,000**	$ 605,751	**$ 613,334**	2.39%
CSO Monitoring Expense	$ 14,639	**$ 20,000**	$ 2,544	**$ 20,000**	$ -	**$ 20,000**	0.00%
Operations Fee-ANR	$ 5,800	**$ 7,400**	$ 7,560	**$ 7,600**	$ 7,600	**$ 7,600**	0.00%
RBC Bearings	$ 461	**$ -**	$ -	**$ 4,500**	$ 2,700	**$ -**	-100.00%
RBC Frames	$ 32,123	**$ 32,000**	$ 35,194	**$ 37,000**	$ 35,194	**$ -**	-100.00%
hauler station	$ -			**$ -**	$ -		#DIV/0!

Repair & Maint Supplies	$ 7,803	**$ 5,000**	$ 6,575	**$ 6,000**	$ 26,851	**$ 13,000**	116.67%
Operating Supplies	$ -	**$ -**		**$ 5,500**	$ -	**$ 5,000**	-9.09%
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	$ 750,881	**$ 791,564**	$ 761,887	**$ 794,400**	$ 830,550	**$ 822,934**	3.59%
SEWER FUND	**6/30/17 ACTUALS**	**2017-18 BUDGET**	**6/30/18 ACTUALS**	**2018-19 BUDGET**	**6/30/19 projected**	**2019-20 BUDGET**	**% Increase**
Audit	$ 1,319	**$ 6,800**	$ 5,194	**$ 5,800**	$ 5,800	**$ 5,800**	0.00%
Legal Services	$ 453	**$ 500**	$ 255	**$ 500**		**$ 500**	0.00%
Contracted Services	$ 2,760	**$ -**		**$ 44,000**			-100.00%
Judgements & Losses		**$ -**					0.00%
Engineering Services	$ -	**$ 1,000**	$ 988				0.00%
Prop & Liab Insurance	$ 24,879	**$ 24,500**	$ 26,933	**$ 27,992**	$ 24,204	**$ 20,416**	-27.06%
Depreciation Expense	$ -	**$ -**					0.00%
STAT Reserve	$ -	**$ 113,704**	$ -	**$ 122,684**	$ -	**$ 25,000**	-79.62%
Interest on Current Loans		**$ -**					0.00%
CWRLF RF1-153		**$ -**		**$ -**			0.00%
Interest Westside 93/15	$ 12,738	**$ 12,057**	$ 12,041	**$ 11,678**	$ 11,678	**$ 11,291**	-3.31%
Interest USDA 92/05	$ 3,324	**$ 3,236**	$ 2,395	**$ -**	$ -	**$ -**	0.00%
Interest VT Municipal Bond	$ 35,593	**$ 30,676**	$ 29,968	**$ 25,029**	$ 25,029	**$ 19,082**	-23.76%
Interest RD Screw Pumps	$ 8,560	**$ 20,431**	$ 20,198	**$ 19,980**	$ 19,980	**$ 19,516**	-2.32%
Interest 92/25 Phase II WW	$ -	**$ -**	$ -	**$ -**	$ 38,430	**$ 75,579**	0.00%
Principal Westside 93/15	$ 16,366	**$ 16,736**	$ 16,736	**$ 17,115**	$ 17,115	**$ 17,502**	2.26%
Principal USDA 92/05	$ 2,508	**$ 2,612**	$ 79,106	**$ -**	$ -	**$ -**	0.00%
Principal RF1016	$ 56,676	**$ 56,676**	$ 56,676	**$ 56,676**	$ 56,676	**$ 56,676**	0.00%
Principal VT Municipal Bond	$ 124,950	**$ 122,500**	$ 122,500	**$ 122,500**	$ 122,500	**$ 122,500**	0.00%
CSO 1-168 Principal		**$ 96,122**	$ 95,132	**$ 69,051**	$ 69,051	**$ 69,051**	0.00%
Principal 92/25 Phase II WW				**$ -**	$ 32,399	**$ 66,079**	0.00%
Principal RD Screw Pumps		**$ 16,307**	$ 16,307	**$ 16,758**	$ 16,758	**$ 17,222**	2.77%
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	$ 290,126	**$ 523,857**	$ 484,429	**$ 539,763**	$ 439,620	**$ 526,214**	-2.51%

Appendix C

Rights-of-Way Report, Truline Land Surveyors, inc.

DUFRESNE GROUP
CONSULTING ENGINEERS

Truline
LAND SURVEYORS, INC.

448 SUMMER STREET, SUITE 102
ST. JOHNSBURY, VT 05819-2159
PHONE/FAX: (802) 748-3946 / truline448@gmail.com

October 16, 2020

Dufresne Group
Attn. Andrea J. Day, PE
459 Portland Street
St. Johnsbury, VT 05819

Re: Various Project Right-of-Ways, St. Johnsbury, VT

Dear Andrea,

Following is a report for each of the highways for your various project areas.

Railroad Street (TH 1) (Maple St. to Concord Ave.)	Laid out as 3 rods wide (49.5 feet) on February 18, 1850 as recorded in Road Book 2, Page 26 of the St. Johnsbury Land Records. A portion of Railroad Street (near Mill Street) was widened on February 11, 1870 to 4 rods wide (66 feet) as recorded in Road Book 2, Page 69.
Washington Avenue (TH 518)	Laid out as 30 feet wide on September 8, 1897 as recorded in Road Book 2, Page 181 of the St. Johnsbury Land Records. A proposed extension of Washington Avenue is shown a plan prepared by John Perham, dated 10-17-44, Truline File #AAA50. No record layout of the extension was found.
Caledonia Street (TH 516):	No record layout observed. A width of 49.5 feet is shown on various surveys. An extension of "Caledonia Street South" was laid out as 2 rods wide (33 feet) on September 9, 1899 as recorded in Road Book 2, Page 202 of the St. Johnsbury Land Records. A width of 33.0 feet is shown on a 1932 survey by John Perham showing a portion of Caledonia Street.

Weeks Court (TH 520):	No record layout was observed.
Bay Street (TH 538)	A portion (Portland Street to underpass) was laid out as 2 rods wide (33 feet) on June 1, 1894 as recorded in Road Book 2, Page 168 of the St. Johnsbury Land Records. A second portion (underpass to Eastern Ave. Ext.) was laid out as 18 feet wide on November 16, 1893 as recorded in Road Book 2, Page 155 of the St. Johnsbury Land Records. A third portion (former Northern Lumber Co to Eastern Ave. Ext.) was laid out as 24 feet wide on July 23, 1900 as recorded in Road Book 2, Page 210 of the St. Johnsbury Land Records.
St. Mary Street (TH 474)	Laid out as 30 feet wide on May 31, 1898 as recorded in Road Book 2, Page 183 of the St. Johnsbury Land Records. The last section of the street was laid out as 16 feet wide in the same deed.
Fairbanks Drive (TH 364)	Laid out as 2 rods wide (33 feet) on February 16, 1875 as recorded in Road Book 2, Page 83 of the St. Johnsbury Land Records. The easterly portion was relocated on September 20, 2001 as recorded in Road Book 4, Page 252 of the St. Johnsbury Land Records. Reference Truline Plan 00C-5-954A.
Barker Avenue (TH 360)	Laid out as 40 feet wide August 4, 1931 as recorded in Road Book 3, Page 112 of the St. Johnsbury Land Records. Reference Plan CC-24.
Portland Street (TH 2): (Bridge to Concord Ave.)	Laid out as 3 rods wide (49.5 feet) on January 15, 1856 as recorded in Road Book 2, Page 40 of the St. Johnsbury Land Records. Highway Project BHF 028-4 (16) is referenced in Road Book 4, Page 107, copies of the plans have not been located (plans assumed to show Portland Street Bridge).
Wright Avenue (PVT):	Shown as a 22-foot wide private right-of-way on a survey prepared by Truline for C. N. Brown Co. with file #89C-5-438.

Truline
LAND SURVEYORS, INC.

448 SUMMER STREET, SUITE 102
ST. JOHNSBURY, VT 05819-2159
PHONE/FAX: (802) 748-3946 / truline448@gmail.com

Please review and contact me with any questions. If copies of any of the above referenced documents are needed please let me know.

Sincerely,

Shane B. Clark, LS
Truline Land Surveyors

Appendix D

Environmental Report

DUFRESNE GROUP
CONSULTING ENGINEERS

VERMONT
ENVIRONMENTAL CONSERVATION

EnvRep-103

Water Investment Division

Environmental Information Document
and Environmental Report

St. Johnsbury Combined Sewer Overflow Elimination
Address
Railroad Street, St. Mary Street, Portland Street, Fairbanks Drive, Barker Avenue

Drinking Water System Name St. Johnsbury Water System
WSID No. 5045
State Assigned Drinking Water Revolving Loan (DWSRF) Number RF3-

Wastewater and/or Stormwater System Name St. Johnsbury Wastewater System
List Existing Permit Numbers:

State Assigned Clean Water Revolving Loan (CWSRF) Number RF1- 251

All Projects: USEPA Grant (STAG) Number
Federal Fiscal Years (s) of USEPA Grant Appropriation

I.) Please provide below a brief description of the project including the purpose and need as detailed in the Preliminary Engineering Report.

The project includes separation of combined sewers on Railroad Street between Bagley Street and Maple Street, replacement of a trunkline on St. Mary Street, separation of combined sewer on Portland Street from Concord Avenue to the Portland Street bridge, installation of a separate storm collection system on Fairbanks Drive to eliminate a stormwater overflow connected to the sewer and disconnection of a storm drain from the sewer and connection to a separate stormwater system on Barker Avenue. The Portland Street project will also include replacement of aging and undersized water main.

The level of detail and the amount of information provided in this environmental report should be commensurate with the magnitude of construction activities and their potential impact on environmental and historical resources. If, for example, a project is likely to have no or very minimal effects, the project representative needs to formally request a Categorical Exclusion in Section V, make simple statements in the spaces provided in Section VI, and attach any additional information like a qualified consultant assessment or determination letters, permits from regulatory authorities, and mapping when available. Projects limited to the existing footprint of a building (e.g., a UV disinfection project) will not generally need to submit an environmental report at all (not applicable to USDA funding).

A more involved and complex project will go through the same review checklist but there will need to be more analysis, explanation, and documentation provided before SRF staff can issue a Categorical Exclusion or a Finding of No Significant Impact (FNSI). Please note that if the project does not meet the Categorical Exclusion criteria mentioned in VII.d.1 of the DWSRF State Environmental Review Process and/or Section VIII of the SRF Environmental Review Procedures, the authorized project representative shall describe the consequences of a specific activity on a specific resource and establish and discuss any mitigation measure(s) necessary to avoid or minimize any adverse impacts to an environmental or historical resource (see Section VII of this report).

Even though applicants are required to integrate and consider environmental and historical values during a proposed project's planning and design, it is the responsibility of SRF review staff to independently evaluate and verify accuracy of information supplied in this environmental report. The SRF staff takes final responsibility for the scope and content of this environmental report. In order to expedite the application process and SRF review and approval of a proposed project, applicants are strongly encouraged to consult early and frequently with our staff to ensure that all environmental issues are described, evaluated, and impacts appropriately considered and mitigated. If a determination is made that an Environmental Assessment or an Environmental Impact Statement is required, the SRF staff will be responsible for initiating the preparation of this document internally or by a third party.

Through a memorandum of understanding between United States Department of Agriculture-Rural Development and the Vermont Agency of Natural Resources, this environmental report format is acceptable to both funding agencies. However, please note that Categorical Exclusion eligibility, public comment, and public notice requirements may differ among the funding agencies.

II.) Drinking Water Projects: Will the project expand capacity to serve more than 500 additional users or a 30% increase in the existing population, whichever is greater? ☐ YES ☒ NO

Wastewater projects: Will the project increase hydraulic (flow) treatment capacity by more than 20%, or increase influent 5-day biochemical oxygen demand (BOD5) organic treatment capacity by more than 30% ? ☐ YES ☒ NO Provide a capacity statement with a chart indicating the existing and proposed hydraulic and organic capacities and indicate the percent change. If there are differences in the permitted vs. physical capacities, include all capacity information.

III.) All projects: Will the project take place in an area designated by the Environmental Protection Agency as a Sole Source Aquifer? ☐ YES ☒ NO

IV.) Drinking water projects: Does the project call for a new withdrawal of groundwater or surface water? ☐ YES ☒ NO

Wastewater or stormwater projects: Does the project include a new discharge to surface water or groundwater? ☐ YES ☒ NO

V.) DRINKING WATER PROJECTS: Will the project result in a 30% increase in groundwater or surface water withdrawal at an existing site? ☐ YES ☒ NO

VI.) Do you believe your project qualifies for a Categorical Exclusion in accordance with the Environmental Review Procedures for projects funded through the Vermont/EPA Drinking Water Revolving Loan Program and/or the Vermont/EPA Clean Water Revolving Loan Program, based on the following environmental information and documentation? ☒ YES ☐ NO

If yes, please fill out only Section VII below. If no, you must fill out Sections VII and VIII for all affected environmental and historical considerations (essentially if you answer "yes" in Section VII you will need to follow-up with mitigation measures or an alternative action plan in Section VIII).

VII.) Environmental Resource and Archeological Checklist

Considerations	Yes or No	*Basis for Determination and Documentation
A.) Air Quality: Will there be any changes to air quality: emissions, noise, dust, odor, etc? Is an Air Pollution Control Permit required? Is your digester unequipped and operated without a flare? Other than the digester flare noted above, are there any other combustion devices at your facility, including but not limited to: stationary internal combustion engines such as diesel generators/ pumps, boilers or space heaters greater than 3 million BTU, or combustion turbines and/or boilers? Note: Emergency generators/pumps are only subject to limited requirements provided they are used strictly for emergency purposes (includes limited emergency demand response programs)	No	CONTRIBUTOR EXPERIENCE: A temporary increase in dust may occur during construction but no significant, long term impacts to air quality will occur due to this project.

and do not participate in peak shaving programs.		
B.) Water Quality and Quantity: Will there be negative direct impacts to water quality or quantity?	No	CONTRIBUTOR EXPERIENCE: The project will eliminate combined sewers that contribute to combined sewer overflows and thereby improve water quality.
C.) Wetlands/Water Resources: Will there be construction in Class II or III wetlands?	No	CONTRIBUTOR EXPERIENCE: All work will occur within the road prism or directly adjacent to it.
D.) Floodplains, Floodways and Fluvial Erosion Hazard Zones(Flood Hazard Areas): Will the project involve construction in a 500 or 100 year floodplain, floodway or fluvial erosion hazard zone, or impact floodplain development?	Yes	Based on the FEMA maps, the work in St. Mary Street will be within the 100 year floodplain.
E.) Stream Alterations: Will the project involve construction in a stream?	No	
F.) Stream Crossings: Will the project involve directional drilling under a stream and/or an aerial crossing over a stream?	No	
G.) Dam Safety: Does the project involves impoundment of more than 500,000 CF of water?	No	
H.) Endangered Species: Is the project likely to adversely affect an endangered or threatened species?	No	*Letter dated September 14, 2020 attached.*
I.) Fish and Wildlife Coordination Act of 1934.	N/A	Fish and Wildlife Coordination Act (March 10, 1934) (last updated July 9, 1965).
J.) Magnuson–Stevens Fishery Conservation and Management: Will the project affect coastal fishing?	**N/A**	***Vermont does not have Exclusive Economic Zones.***
K.) Migratory Bird Treaty Act: Will the project affect migratory birds?	No	*For information about the MBTA please visit the following website: https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php*
L.) Historic Preservation: Will the project adversely affect cultural resources such as archeological or historic sites and/or National Landmark?	No	Pending verification by the consultant contracted by the State of Vermont.
M.) Wild and Scenic Recreational Rivers: Is the project within a quarter-mile of a river on the National Park	No	CONTRIBUTOR EXPERIENCE: Project is not near any rivers on the National Park Service's Nationwide Rivers Inventory.

Service's Nationwide Rivers Inventory? Will the project impact a wild, scenic or recreational river area and create conditions inconsistent with the character of the river?		
N.) Public Lands: Will the project adversely impact formally-classified local, state, and federal lands (e.g., parks, natural areas, wildlife management areas, and wilderness areas)?	No	CONTRIBUTOR EXPERIENCE: Project is not near any local, state or federal lands.
O.) Farmland: Will the project convert Agricultural Soils to non-agricultural uses?	No	CONTRIBUTOR EXPERIENCE: Project is within existing developed urban area.
P.) NEPA: Is there a controversy with respect to environmental effects of the project based on reasonable and substantial issues?	No	CONTRIBUTOR EXPERIENCE
Q.) NEPA: Is the project significantly greater in scope than normal projects for the area?	No	CONTRIBUTOR EXPERIENCE
R.) NEPA: Does the project have significant unusual characteristics?	No	CONTRIBUTOR EXPERIENCE
S.) NEPA: Does the project establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects (cumulative impact based on current information)?	No	CONTRIBUTOR EXPERIENCE
T.) NEPA: Does the project have significant adverse direct or indirect effects on parkland, other public lands, or areas of recognized scenic or recreational value?	No	CONTRIBUTOR EXPERIENCE
U.) Population: Will the project provide new drinking water facilities to serve populations of over 2000 persons, and/or wastewater or stormwater facilities in communities of over 10,000 persons?	No	CONTRIBUTOR EXPERIENCE: No expansion of water supply proposed.
V.) Socio-economics: Is the project known or expected to have a significant negative effect on the quality of the human environment? Is there potential for significant changes to the socio-economic make-up of the area? Is the project cost-effective?	No	
W.) Land Use: Is additional Land Use and Development Act (Act 250) review	No	CONTRIBUTOR EXPERIENCE: Utility replacement projects do not typically require Act 250 review.

and approval necessary?		
X.) Growth: Does the project contribute to growth outside of designated growth centers?	No	CONTRIBUTOR EXPERIENCE: Project is utility replacement within areas that have existing utilities.
Y.) Cumulative Impacts: Will the project cause other significant environmental impacts, including secondary impacts?	No	CONTRIBUTOR EXPERIENCE: Project includes improvements that will reduce or eliminate combined sewer discharges which will have a positive environmental impact.

VIII.) Mitigation Measures and/or Alternative Plans of Action (if applicable, in order to minimize adverse effects) Explain how mitigation measures will be achieved and monitored (Special Grant Condition or review of Plans and Specifications). Remember to consider structural and non-structural methods.

Affected Environmental or Archeological Resources	Mitigation Measures or Alternative Plan of Action
A.) Floodplains, Floodways and Fluvial Erosion Hazard Zones – Construction in St. Mary Street will occur within the 100-year floodplain.	Permits for work in the floodplain will be obtained from ACOE, the State of Vermont and the Town of St. Johnsbury.
B.)	
C.)	
D.)	

	3/1/2021	Consulting Engineer
Prepared By	Date	Title
Reviewed By	Date	Authorized Representative

*Basis for Determination and Documentation

The basis for determination and documentation information must be traceable and establish the factual data to support the response to each question. Any environmental concerns that are raised by federal, state, or local agencies or the public must be addressed as completely as possible and resolved before the environmental report will be considered complete. All supporting documentation (e.g., correspondence and exhibits) should be attached and easily cross-referenced back into the main body of the environmental report. Types of information to be included in this column are outlined below.

1. FIELD OBSERVATION: A site visit that does not usually involve any testing or measurements. FIELD OBSERVATION is an important method for initial screening of the issues, but for some of the categories it may be inadequate for final evaluation. Support documentation should include date of the site visit and by whom.

2. PERSONAL CONTACT: Personal contacts are useful when the individual contacted is an accepted authority on the subject(s) and the interview is documented. Supporting documentation should include the name, organization, and title of the person contacted and the date of the conversation. *Copies of written site inspection reports and determinations by regulatory authorities on applicability of regulations and permit requirements should be attached*.

3. PRINTED MATERIALS: These are useful sources of detailed information, materials such as comprehensive land use plans, maps, statistical surveys, and studies. Information must be current, i.e., not so old that changing conditions make them irrelevant and must represent accepted methodologies. Citations for the material should include enough information so that an outside reviewer can locate the specific reference.

4. SPECIAL STUDY: This is a study conducted for an individual factor or resource, and should be performed by a qualified person using accepted methodologies. Some tests are relatively simple to perform but others may require elaborate equipment or personnel with additional expertise. The preparer is responsible for obtaining assistance from others in order to have the appropriate test or studies conducted. Copy of the study must be appended or referenced as for Printed Materials.

5. CONTRIBUTOR EXPERIENCE: The professional judgment of the persons contributing to this environmental report can be useful provided their expertise is relevant. The contributor may have previous knowledge from familiarity with the area, or may have professional background to make judgments about a specific factor. Provide information of the person's qualification in addition to name, organization and position.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: September 14, 2020
Consultation Code: 05E1NE00-2020-SLI-3953
Event Code: 05E1NE00-2020-E-12314
Project Name: St. Johnsbury Combined Sewer Elimination

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-3953

Event Code: 05E1NE00-2020-E-12314

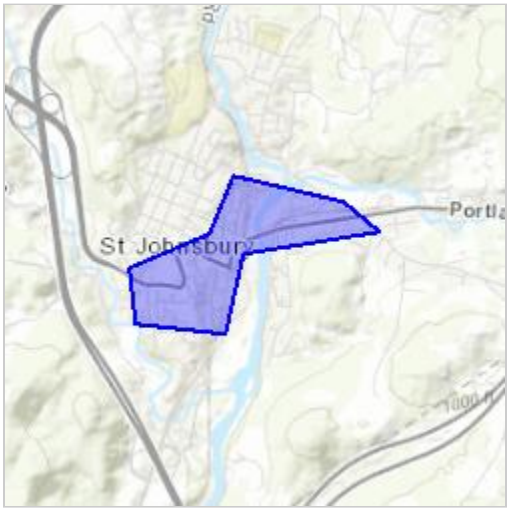
Project Name: St. Johnsbury Combined Sewer Elimination

Project Type: WASTEWATER PIPELINE

Project Description: Project includes separation of combined sewer in several streets in the Town of St. Johnsbury. All work is proposed to be withing existing developed roads or rights-of-way. Construction would occur from June-November.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.4185015072955N72.0184765920481W



Counties: Caledonia, VT

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.