TOWN OF BRIGHTON
MONROE COUNTY, NEW YORK

Engineer's Report
Sanitary Sewer Feasibility Study
Westfall Heights

Town of Brighton

February 2014
Project No.

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I. Introduction

A. Purpose and Background

Currently, the wastewater generated by the homes within the Westfall Heights neighborhood is treated by individual on-site septic systems. The soil type, high ground water levels, and soil permeability found in the Westfall Heights area are not conducive to this type of wastewater treatment system and shorten the operational life of the individual septic systems. Therefore, the Town of Brighton is seeking to explore alternate methods of collecting this wastewater and ultimately conveying it to Monroe County's Van Lare Wastewater Treatment Plan. The collection system would replace the current on-site septic systems. This Sewer Feasibility Study evaluates two possible sewer conveyance systems and the resulting annual cost per resident once the system is constructed. The two alternate conveyance systems that were evaluated are a low pressure system and a conventional gravity sewer/pump station system.

The main goals of this study are:

1. Evaluate the feasibility of constructing a low pressure sewer system and a conventional gravity sewer/pump station system.
2. Evaluate the financial impact of constructing the alternate sewer conveyance systems.
3. Present findings to the Westfall Heights residents to determine acceptance.

B. Methodology

The feasibility study is built upon the following study components:

- A review and analysis of existing information and relevant reports on the wastewater collection and treatment systems serving the Westfall Heights area.
- Assemblage of necessary mapping for the study including, United States Geological Survey (USGS) topographic maps, aerial photographs, Natural Resources Conservation Service (NRCS) soil maps, watershed boundaries, tax map parcels and properties in the study area.
- Determination of existing and projected flow characteristics of the overall study area and watersheds.
- Developing a conceptual layout of the wastewater conveyance systems.
- Preparation of capital cost estimates for the alternate conveyance systems.
- Conduct a financial analysis to determine the financial impact on the residents
- Identification of potential funding sources.
- Preparation of comprehensive report that summarizes the findings of the study and includes all supporting maps, tables, schematics, and appendices.
- Present the findings of this report to the Helen Road, East River Road, Bastian Road and Norman Road residents

C. Ten States Standards

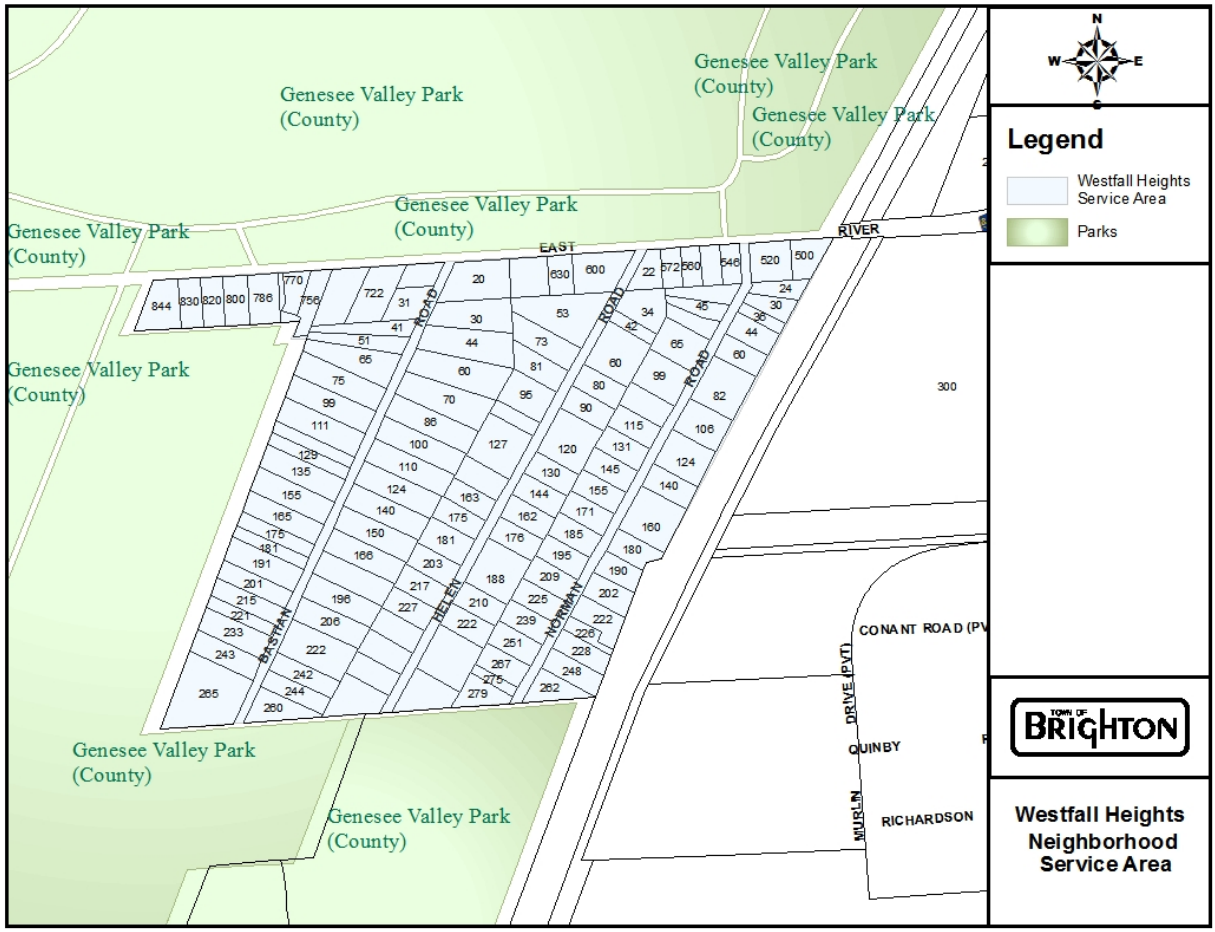
Section 11.2 titled, "Facility Plans" of the *Recommended Standards for Wastewater Facilities* (Ten State Standards), 2004 Edition, provides a preliminary outline which was used to develop the methodology described previously.

II. Description of Planning/Service Area

A. Location

The Westfall Heights neighborhood is located west of Murlin Drive and south of East River Road in the Town of Brighton. The Westfall Heights subdivision includes Bastian, Helen, and Norman Roads. The subdivision is bordered by Genesee Valley Park to the north, west, and south. Figure II.1 depicts the study service area.

Figure II.1 Study Service Area



B. Existing Conditions

The Westfall Heights Subdivision is located within the Red Creek watershed and is in an area that exhibits environmental constraints that may shorten the operational life of the existing sanitary sewer septic systems. These restraints include a high water table, saturated soils with poor drainage characteristics, and relatively flat grade. The study service area and most of West Brighton was once covered by shallow Lake Scottsville, a lake that formed during the glacial recession. The melting of the glacier deposited great quantities of fine-grained sediments into the lake. As a result of this process and the eventual draining of the lake, most of the surface is comprised of silts and sands interspersed with clay materials with bedrock depths generally greater than 20 feet.

The service area is relatively flat with elevations generally ranging from the 510 to 540 foot contours. The general grade of the land is a gradual positive slope from the southwest to the northeast. As a result of the overall gentle grade, surface drainage is problematic while the impervious soils restrict subsurface drainage.

Silts and clays mainly dominate the soil conditions within the Westfall Heights neighborhood, but concentrations of sands and other coarse textured materials may be found as a result of periodic flooding of the Genesee River and Red Creek. According to the USDA, Westfall Heights is in a soil area that is rated “very limited” for a septic tank absorption field. The USDA Soil Survey report that describes the soil types and characteristics found in Westfall Heights is included in Appendix B.

C. Existing Land Use and Zoning

The Westfall Heights subdivision sits in a residential, low density zoning district designated as RLB. The subdivision is surrounded by designated park land to the south, west, and north. Additionally, the Westfall Heights neighborhood is surrounded by both State and Federal Regulated wetlands. Therefore, future development within or adjacent to the Westfall Heights sanitary sewer system service area is not anticipated. Figure II.2 depicts the Westfall Heights neighborhood along with classifications of land use, while Figure II.2b depicts the delineated wetlands surrounding the neighborhood.

Figure II.2: Westfall Heights Land Use Map

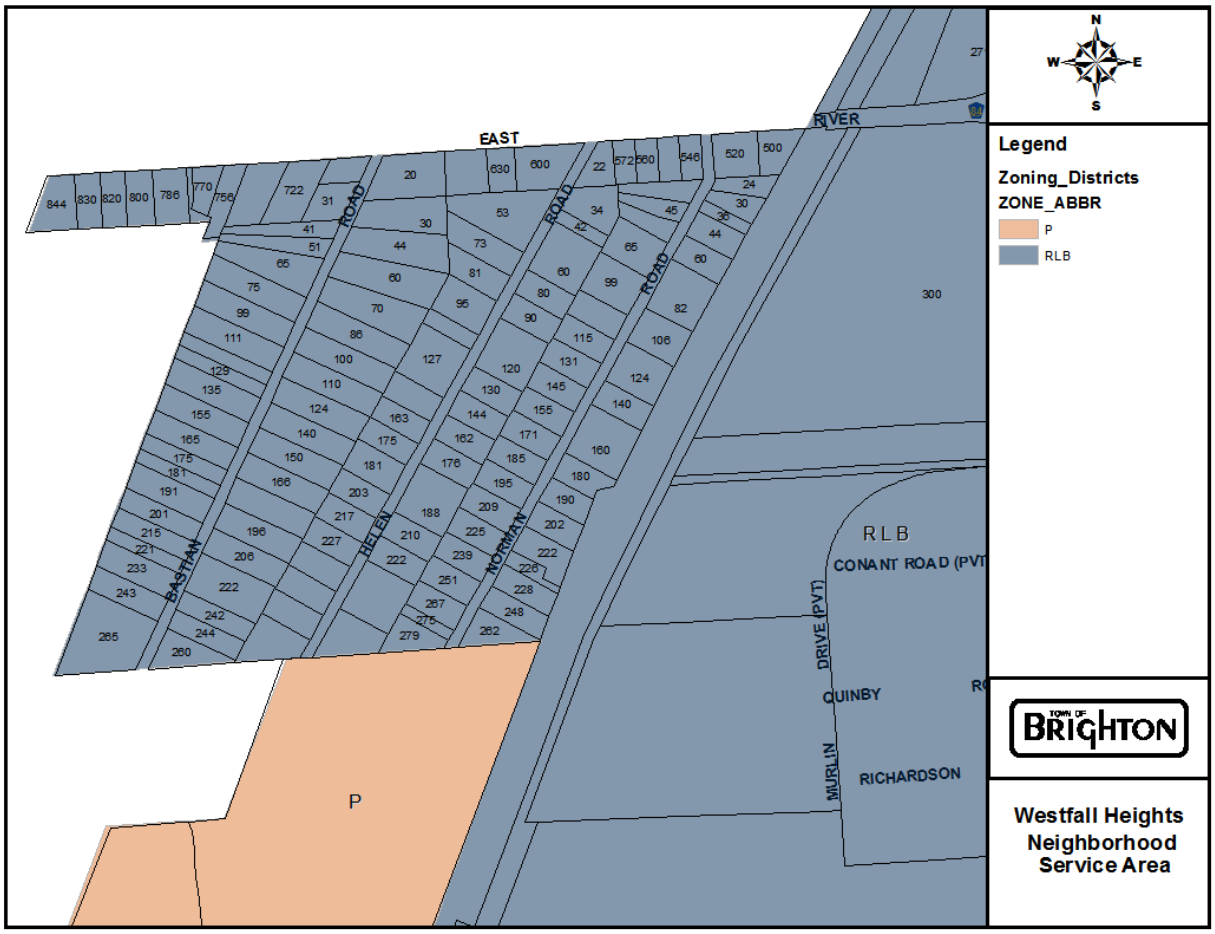
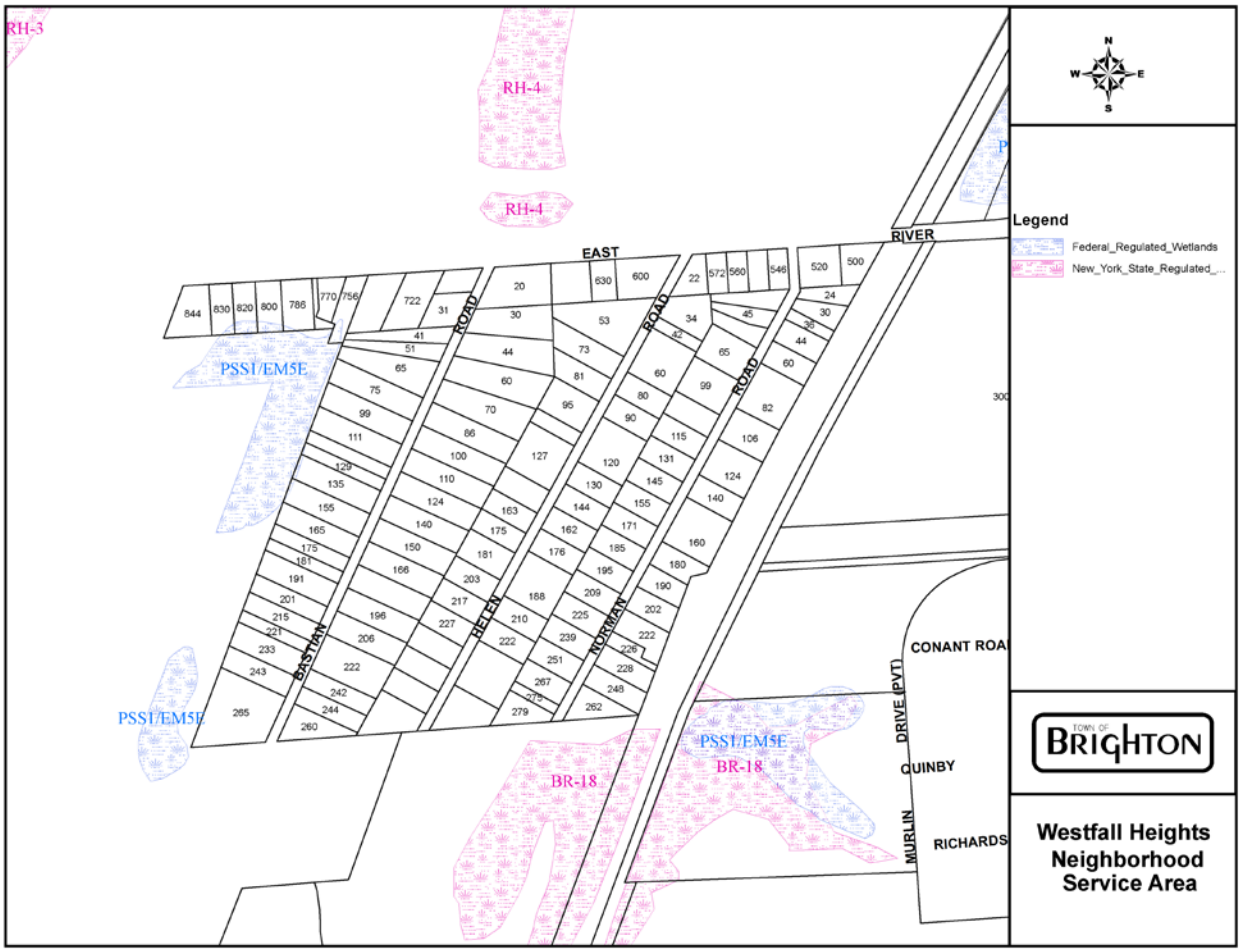


Figure II.2b: Westfall Heights Wetland Map

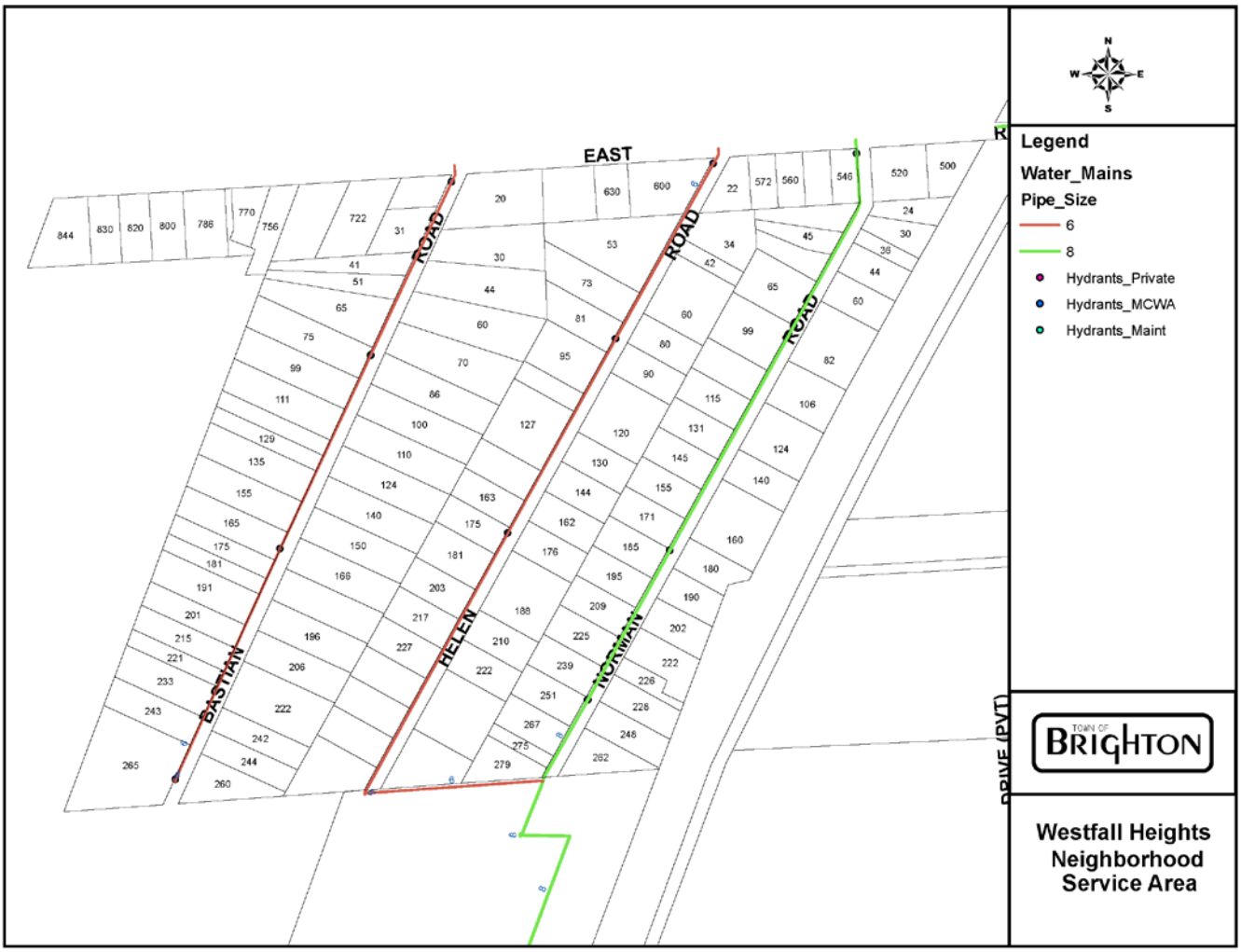


D. Existing Infrastructure

1. Water Mains

The Westfall Heights neighborhood lies within the Brighton Consolidated Water District and is currently served by public water mains that run parallel to the main roads in the area. Area mapping shows that the water mains run along the west side of the roads, and consist of an 8" main serving Norman Road and 6" mains serving Bastian and Helen Roads. Figure II.3 depicts the water main sizes and locations in the Westfall Heights neighborhood.

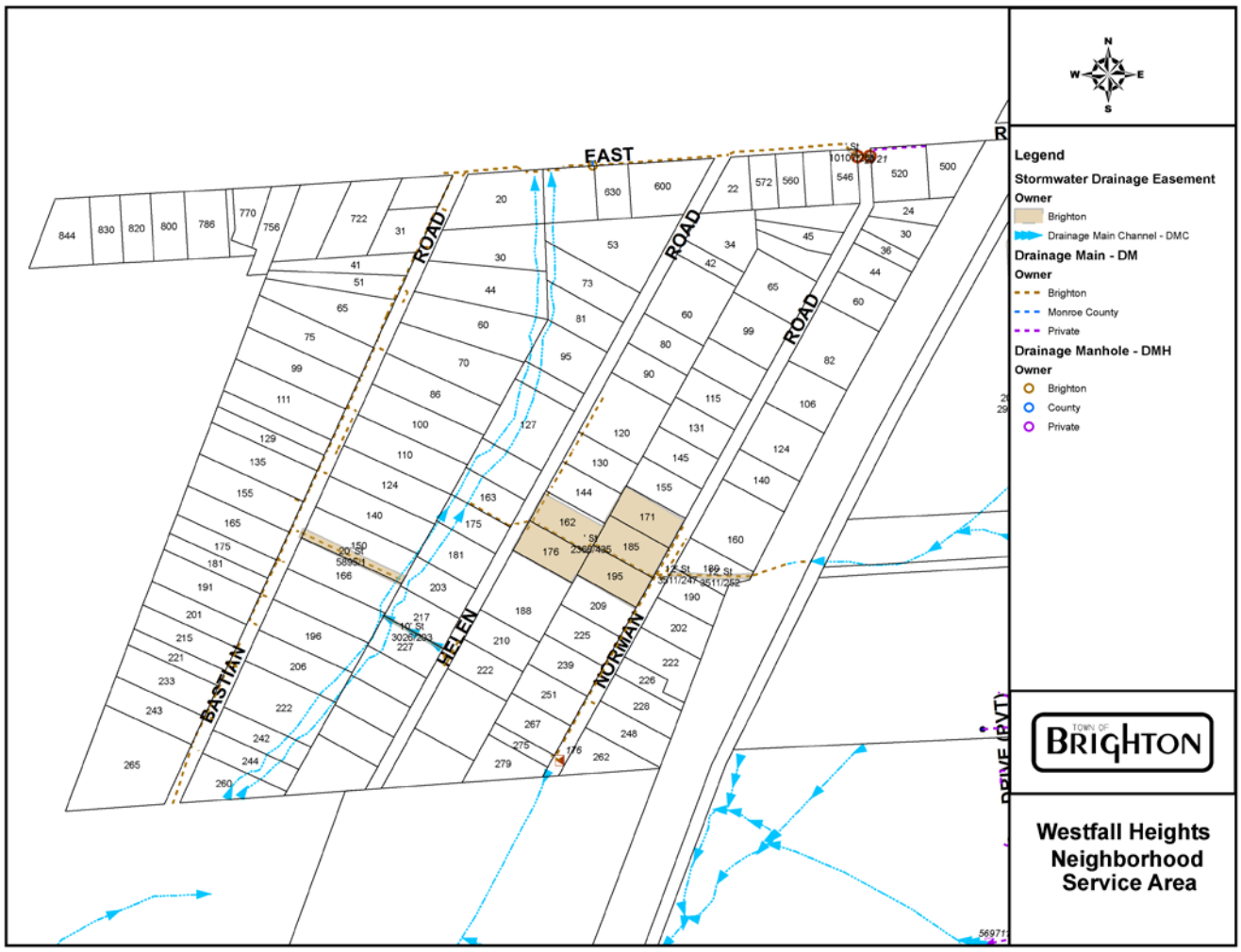
Figure II.3: Water Service Map



2. Storm Sewers

The Westfall Heights neighborhood is currently served by a variety of storm sewer sections and swales that ultimately discharge into Red Creek. Figure II.4 depicts the storm sewer locations in the Westfall Heights neighborhood.

Figure II.4: Drainage Map



III. Planning Period

A. Twenty Year Period

A twenty (20) year planning period has been established for this study as recommended by Ten States Standards for Wastewater Facilities.

B. Twenty Year Population Projections and Growth Rates

The Town of Brighton, like the majority of upstate New York, is experiencing growth at a slow pace. In the Westfall Heights study area, population projections for the design year of 2033 show that the total population growth for the Westfall Heights neighborhood will only be 6 people or a modest 2.1% growth over the next 20 years.

Population figures for years 1980, 1990, 2000 and 2010 were obtained from census data available for the Town of Brighton. The 2013 and 2027 populations were calculated through interpolation. Table III.I depicts the interpolated populations for years 2013 and 2033.

Table III.1: Westfall Heights Population Growth

Study Area	2013 Population	2033 Population	20 Year Growth Rate	Average Person per Home
Westfall Heights	261	267	2.1	2.05

IV. Present and Future Sanitary Sewer Flows

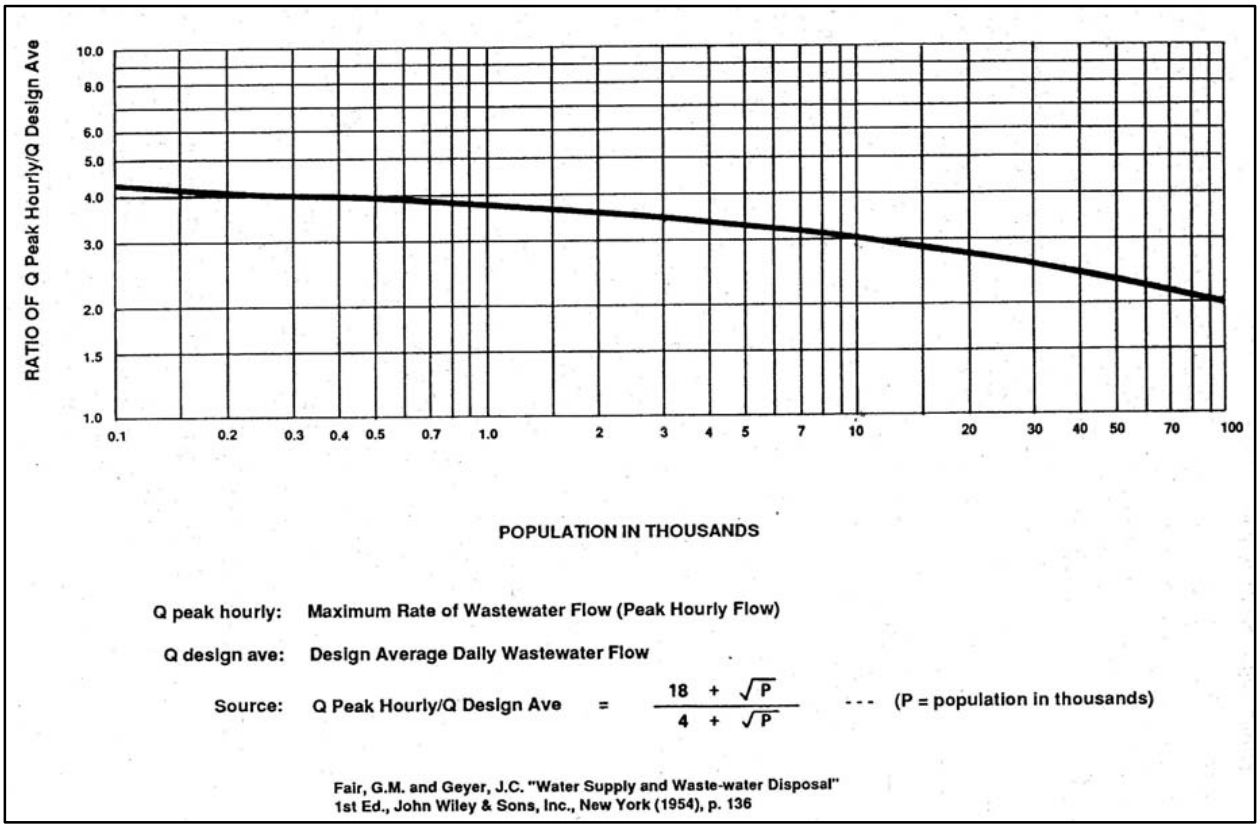
A. Methodology

Average Daily Flow was derived from the Monroe County Water Authority water consumption data from 2008 to 2010. The MCWA data indicates that the average annual water use per resident within the study area is 34,750 gallons per year per unit. Dividing the annual water use by 365 days per year provides an Average Daily Flow (ADF) per unit of 95 Gallons per Day per Unit (GPDPU).

B. Peak Hourly Flows

In accordance with Ten States Standards the ADF then requires a factor to determine the peak hourly flow rate. The peak factor (PF) is determined based on service area population. Figure IV.1 depicts a graph of the ratio of peak hourly flow to average daily flow relative to service area populations.

Figure IV.1: Ratio of Peak Hourly Flow to Average Daily Flow



C. Existing and Projected Flows

Based on the service area's summation of existing residential properties and allocation of 95 GPD per property, the average daily flow for the service area was calculated. Based on the population, a peaking factor was selected and a peak hourly flow was calculated for the service area. Table IV.1 lists Average Daily Flow, Peak Flow Factor and Peak Hourly Flow for the Westfall Heights service area in 2013.

Table IV.1: 2013 Average Daily and Peak Flows

Service	2013 Average Daily Flow (GPD)	Peak Flow Factor (PF)	Peak Hourly Flow (GPD)
Westfall Heights	12,397	4.1	50,828

Using projected 2033 growth rate percentages, the 2033 average daily flow for the service area was calculated. Table IV.2 lists Average Daily Flow, Peak Flow Factor and Peak Hourly Flow for each service area for the year 2033.

Table IV.2: 2033 Average Daily and Peak Flows

Service	2033 Average Daily Flow (GPD)	Peak Flow Factor (PF)	Peak Hourly Flow (GPD)
Westfall Heights	12,683	4.1	52,000

V. Sewer Collection Systems

The purpose of this section is to evaluate alternative municipal sewer technologies to present a cost effective and reliable public sewer collection system for the study area. A conventional gravity sewer/pump station system and a low-pressure sewer collection system were evaluated for this area.

A. Conventional Gravity/Pump Station System

In a Conventional Gravity/Pump Station sewer system the wastewater flows by gravity to a common collection point, a pump station. The pumping station then lifts the sewage to an existing gravity collection system or transports it directly to a treatment facility.

The gravity portion of this sewer system utilizes a non-mechanical process to collect and transport wastewater and requires minimal maintenance because it relies upon gravity to convey the sewage through the piping system. A conventional gravity sewer system is the most common type of collection system.

The topography of the Westfall Heights neighborhood promotes the installation of a gravity sewer that is sloped towards the southern end of the service area, away from the closest sanitary manhole in the Brighton Consolidated Sewer District. A centralized pumping station is required to convey the wastewater to the existing sanitary sewer located along the south side of E. River Road approximately 600 feet east of Norman Road.

B. Low Pressure/Grinder Sewer Systems

Low-pressure sewer systems utilize small grinder pumps at each wastewater source and small-diameter low-pressure sewers for transmission either to a central lift station, existing collection system or directly to a wastewater treatment plant. Wastewater from the residence is

discharged to a grinder pumping station. An individual pump station will be provided for each resident and will be located within the road Right of Way.

The grinder pump station consists of a small wet well that is typically 4 to 6 feet deep and made of fiberglass, plastic or steel with a diameter of 24 to 30 inches. The wet well is generally designed to have an emergency capacity to hold the volume of wastewater generated during a 24 hour period. Grinder pumps range from 1 to 5 horsepower, depending upon the type of pump selected and the number of units served. The wet well collects domestic sewage and when it is filled to a preset level, a float switch (or other liquid level switch) turns the pump on. All solids in the waste stream are ground to a slurry and pumped through small diameter pressure sewers.

The low pressure pump station can be located in an easement, on private property or in the road right-of- way and requires a power source. The pump stations can be privately or publically owned and maintained. The stations typically have either a lightweight aluminum or cast-iron lid. An anti-flotation base may be required in certain conditions. Since these systems do not rely on gravity, the conveyance system can be constructed with a minimum cover (frost line, generally 4.5' – 5' in upstate New York) and follow the topography of the land.

Low-pressure sewer systems have been successfully used for decades. They are considered to be very reliable and cost-effective. The construction costs are generally less than a conventional system because the low pressure collection piping can be installed at relatively shallow depths and it does not have to be constructed an a constant gradient.

C. Alternate Systems Evaluation

A preliminary design was developed and the capital and operation/maintenance cost was estimated for each of the proposed alternate sewer conveyance system serving the Westfall Heights neighborhood. These costs were compared to determine the most cost effective option. The following paragraphs provide a conceptual layout along with a corresponding cost estimate for each sewer conveyance alternative.

1. Gravity/Pump Station Sewer Conveyance System

This alternative is a combination of gravity sewer, force mains, and a centralized pumping station. In the proposed layout, an 8" gravity sewer will begin about .2mi west of Bastian Road and continue along the southerly side of East River road to Bastian. The route is within the road right of way. After turning perpendicular to East River Road, the route will continue down the center of Bastian road and past the end of the road approximately 40' before turning east and terminate at a pump station before reaching Red Creek.

At the intersection of East River Road and Helen Road an 8" gravity sewer will serve all of the properties on Helen road. The route is proposed to travel south and terminate at a manhole at

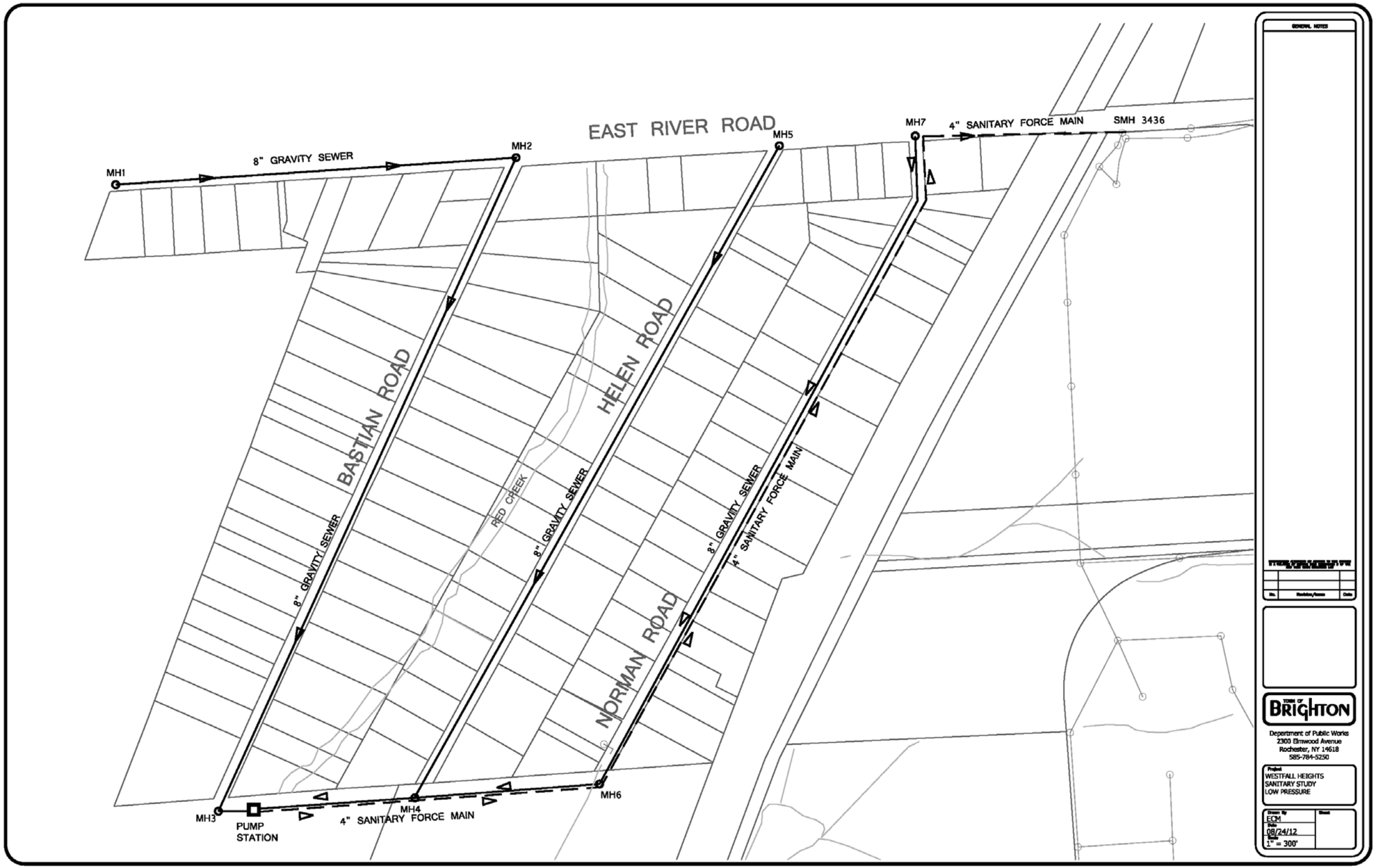
the end of the road. From this manhole the effluent will continue to the west and under Red Creek to reach the pump station at the end of Bastian Road.

An 8" gravity sewer will also be installed at the intersection of East River Road and Norman Road. This sewer extend south approximately 2000 feet along the centerline of Norman Road. The sewer will then terminate at a manhole, and travel by gravity to the manhole at the end of Helen Road where it will join the connecting line under Red Creek to the pump station.

From the pump station, a force main will run east under Red Creek and share a trench with the gravity collection line. This force main will turn north and share a trench with the gravity sewer on Norman Road until it meets East River Road. The proposed force main will then continue east approximately 600' along the southerly side of East River Road within the right of way and connect to the existing sanitary manhole, SMH 3436.

Figure V.1 depicts the concept layout for the proposed gravity/pump station system alternative.

Figure V.1 Gravity/Pump Station System Conceptual Layout



Cost Estimates Conventional/Pump Station System

a) Probable Cost of Construction, Capital Cost

Table V.1 demonstrates an estimated cost of construction for the proposed layout depicted in Figure V.1. This cost was determined using 2013 cost data from RS Means catalogue, and construction cost data of previous similar projects constructed within the Town.

Table V.1 Gravity/Pump Station System Cost Estimate

Estimated Construction Cost

Item	Description	Quantity	Units	Price	Cost
1	8" SDR 35 Sanitary Sewer	9500	LF	$55.00	$522,500.00
2	4' Dia Sanitary Sewer Manhole	32	EA	$3,000.00	$96,000.00
3	Submersible Pump Station	1	EA	$290,900.00	$290,900.00
4	4" IPS DR-17 HDPE Force main	3773	LF	$45.00	$169,785.00
5	4" Short Side Sanitary Sewer Lateral	79	EA	$1,000.00	$79,000.00
6	4" Long Side Sanitary Sewer Lateral	51	EA	$1,200.00	$61,200.00
7	Cleanout Assembly	130	EA	$750.00	$97,500.00
8	Roadway Restoration	13358	SF	$13.00	$173,654.00
9	Lawn Restoration	82644	SF	$3.50	$289,254.00
10	Erosion Control	1	EA	$32,000.00	$32,000.00
11	Connect to Existing Manhole	1	EA	$5,000.00	$5,000.00
12	Compaction	1	LS	$50,000.00	$50,000.00
13	Testing	1	LS	$5,000.00	$5,000.00
14	Maintenance and Protection of Traffic	1	LS	$25,000.00	$25,000.00
15	Mobilization	1	LS	$45,000.00	$45,000.00
				Subtotal	$1,941,793.00
				10% Contingency	$194,179.30
				Construction Total	**$2,135,972.30**
				Engineering 10%	$213,597.23
				Legal, Administration, 5%	$106,798.62
				Construction Observation 10%	$213,597.23
				Total Estimated Project Cost	**$2,669,965.38**

b) Annual Operation and Maintenance Costs

The annual operation and maintenance (O&M) costs associated with a conventional/pump station sewer system are expected to be similar to the O&M costs associated with other recently formed sanitary sewer districts in the Town of Brighton. The recently created Sanitary Sewer District 87A (Deerfield) provides an adequate gage of O&M charges to expect for a new sewer

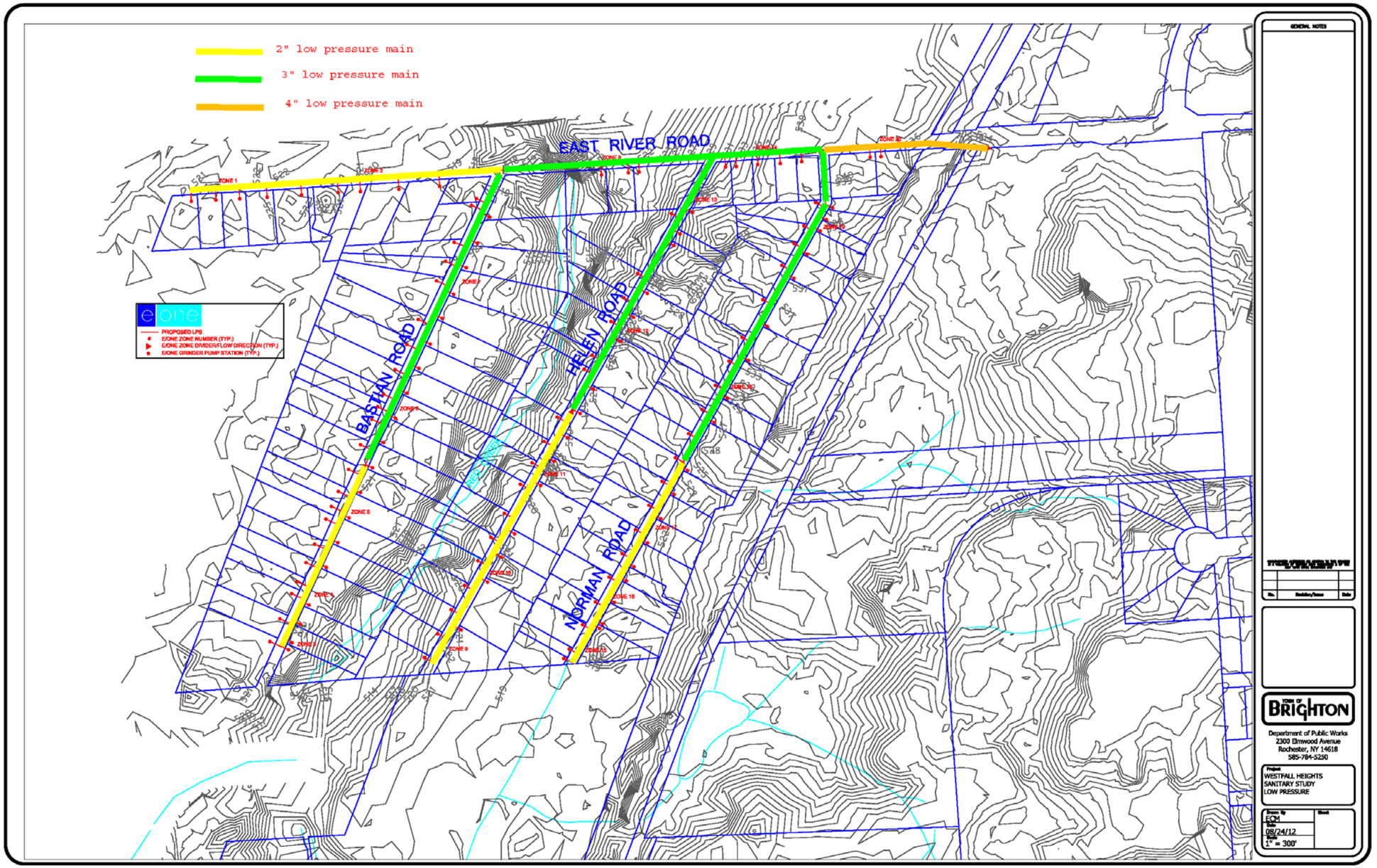
district. The 2014 annual O&M charges for District 87A is $72.90 per unit. For budgetary purposes, an annual charge of $72.90 per unit was used in the financial analysis of the conventional/pump station system.

2. Low Pressure Sewer Conveyance System

The conceptual layout for this system begins approximately 0.2mi west of Bastian Road. A low-pressure sewer will extend east and ultimately connect to the existing sanitary sewer manhole which is located approximately 600' of Norman Road and designated SMH 3436. Wastewater generated by the homes along Bastian, Helen and Norman Roads will be collected in low pressure forcemains and conveyed to the low pressure sewer along East River Road. The size of the low pressure sewer is determined by the wastewater flow being conveyed and varies throughout the project. Each occupied residential property will be equipped with a grinder pump/wet well and the corresponding appurtenances such as check valves.

Figure V.2 depicts the conceptual layout for the proposed pump station system alternative.

Figure V.2 Low Pressure System Conceptual Layout



Cost Estimate Low Pressure System

a) Probable Cost of Construction

Table V.2 demonstrates an estimated cost of construction for the proposed layout depicted in FigureV.2. This cost was determined using 2013 cost data from RS Means catalogue, and construction cost data of previous similar projects constructed in the New York upstate region.

Table V.2 Low Pressure System Cost Estimate

Estimated Construction Cost

Item	Description	Quantity	Units	Price	Cost
1	Odor Control Bioxide		LS		$0.00
2	Air release valves	4	EA	$3,600.00	$14,400.00
3	Low Pressure Pump Station	130	EA	$2,800.00	$364,000.00
4	Install Low Pressure Pump Station	130	EA	$4,500.00	$585,000.00
5	2" IPS DR-17 HDPE Force main	3996	LF	$15.00	$59,940.00
6	3" IPS DR-17 HDPE Force main	4804	LF	$20.00	$96,080.00
7	4" IPS DR-17 HDPE Force main	611	LF	$23.00	$14,053.00
8	1-1/2" short side lateral	71	EA	$900.00	$63,900.00
9	1-1/2" long side lateral	59	EA	$900.00	$53,100.00
10	Maintenance and Protection of Traffic	1	LS	$25,000.00	$25,000.00
11	Compaction	1	LS	$12,000.00	$12,000.00
12	Roadway Restoration	13358	SF	$8.00	$106,864.00
13	Lawn and Right of Way Restoration	82644	SF	$0.70	$57,850.80
14	Erosion Control	1	LS	$32,000.00	$32,000.00
15	Connect to Existing Main	1	EA	$5,000.00	$5,000.00
16	Sewer Testing	1	LS	$1,000.00	$1,000.00
17	Mobilization	1	LS	$45,000.00	$45,000.00
18	Directional Drill	200	LF	$28.00	$5,600.00
19	Check Valves	130	EA	$12.00	$1,560.00
20	Cleanouts	0	EA	$1,500.00	$0.00
21	on/off valves and corporation stops	130	EA	$125.00	$16,250.00

Subtotal A	$1,558,597.80
10% Contingency	$155,859.78
Subtotal B	$1,714,457.58
Engineering 10%	$171,445.76
Legal, Administration, 5%	$85,722.88
Construction Observation 10%	$171,445.76
Construction Total	**$2,143,071.98**

b) Annual Operation and Maintenance Costs

Low pressure pump manufacturers were consulted to derive the anticipated pump replacement costs and annual O&M charges. Based on the assumption that 10% of the individual grinder pumps would be replaced annually, it is estimated that each homeowner would be assed an annual fee of approximately $50 to fund the pump replacement program.

3. Summary of System Comparison

a) Advantages

Advantages	
Conventional Gravity/Pump Station System	Low Pressure/Grinder System
Emergency generators can be installed at pump stations to operate during power outages	The diameters of the low-pressure mains are normally smaller than other systems.
Materials and construction methods are advanced and proven	Low-pressure mains are typically installed at shallow depths and do not require installation at grade or with special profiles.
The gravity portion of the system requires little maintenance	Construction is easier at shallow depths and has far less impact on the residents, existing roadways and utility lines
	Trenchless construction methods can be used to provide significant cost savings and minimal disruption of traffic and other utilities
	The cost of construciton is generally lower than the cost to install alternative systems

b) Disadvantages

Disadvantages	
Conventional Gravity/Pump Station System	Low Pressure/Grinder System
Pump Stations must be maintained and provided with power	A residential application generally requires that each parcel is equipped with a grinder pump station therefore there are a large number of pumps to maintain
Central pump stations are expensive to construct, operate, and maintain	Grinder pump stations require regular maintenance to continue functioning properly. Depending on the requirements of the newly formed sewer district the maintenance of the unit may be the responsibility of the homeowner or the Town
Construction requires large eqipment with potential traffic disruption and greater impact the residents and other utilities	Given that grinder pump stations require electrical power to operate, the system does not function when there are power outages
The cost of construciton is generally higher than the cost to install alternative systems	Air-release values are required at high points in the system and require regular maintenance to avoid air locks
	Pumps typically have a design life of 5 to 10 years, and then require replacement
	There is a potential for odors from older sewage and air release valves. Odor control improvements may be necessary

VI. Financial Analysis

A. Methodology

In order to provide a better understanding of the costs associated with the construction of either one of the systems being explored for this area, a detailed financial analysis was performed. The financial analysis provides estimated annual costs associated with each parcel within the Westfall Heights service area. This section describes the methodology employed to estimate the total annual cost per dwelling unit, (DU) required to fund the proposed sanitary sewer infrastructure.

The financial analysis considers a low pressure system since the capital and Operation/Maintenance Cost associated with this system is substantially less than that of a

Conventional Gravity Sewer/Pump Station system. The annual debt service per household is determined on a unit benefit basis in accordance with Chapter 147 of the Code of the Town of Brighton. Rental units for each property are shown in the appendix and were determined as follows:

(1) A one-family dwelling or any part or parts thereof and located upon premises not exceeding 100 feet in frontage and 200 feet in depth shall constitute one rental unit. Such properties with frontage over 100 feet will be charged one unit for the first 100 feet plus 1/10 unit for each additional 10 feet of frontage or major fraction thereof. Area of such properties in the sewer district and more than 200 feet from the frontage will be assessed at the rate of 1/10 additional unit for each 1/10 acre or major fraction thereof which is located more than 200 feet from the frontage.

(2) Properties in the sewer district which have no frontage will be assessed 1/10 unit for each 1/10 acre in excess of the basic minimum one-unit formula of 100 feet by 200 feet. Vacant properties will be assessed 1/10 unit

If agreeable by the property owners within the study area a new Sewer District will be created to facilitate this project. Creating a new district would provide a method to fund the project and fairly distribute the annual costs associated with the district among the parcels within the proposed service area.

It is anticipated that the Town will finance the project by borrowing money under the new district to pay for the proposed improvements. This report assumes that the funding will be financed for a 20 year time period and be subject to an annual interest rate of 4.8%. A charge per parcel for the capital costs is calculated by dividing the annual debt service of the bond by the total number of units in the district.

The operation and maintenance costs for the proposed systems were described in Section V of this report. A charge per parcel for the operation and maintenance is calculated by dividing the estimated total O & M Expense by the total number of units in the district. These costs will be distributed among the properties based upon the units associate with each property.

In addition to the Town of Brighton operation and maintenance costs (O&M), the Monroe County Irondequoit Bay Pure Waters District, MCPW, levies annual capital and O&M to each parcel. The MCPW capital costs and operation and maintenance (O&M) include the following charges:

(1) The Monroe County Irondequoit Pure Waters (MCPW) O&M charge is based on water consumption, and is currently $1.4525 per 1,000 gallons of water. A “typical” residence, with an annual water consumption of 60,000 gallons would pay $87.15 per year for operation and maintenance of the wastewater treatment facilities and interceptor sewers. Section IV, paragraph A, indicated that average daily flows were estimated using water consumption data. Using this data, the

estimated water use for the total service area is 34,750 gallons per year for a single residential property. This value is considerably lower than expected and may be due to conservative water use patterns for the purpose of not overloading existing individual waste disposal systems. In order to provide conservative operation and maintenance (O&M) costs associated with the quantity of water used once public sewers are available, a more representative value of 60,000 gallons per year for a single residence

(2) The Monroe County Pure Waters (MCPW) parcel and capital charge is currently $27.39 per parcel within any Town of Brighton Sewer District.

Table VI.1 lists the estimated annual unit charges to be borne by those properties within the proposed district who connect to the proposed low pressure sewer collection system. Those properties within the proposed district that choose not to connect to the new sewer system will be responsible to pay only the Annual Debt Service.

Table VI.1 Estimated Annual Costs (Low Pressure System Alternative)

Address	Annual Debt Service	MCPW Capital Charge	BCSD O & M Charge	MCPW O & M Charge	Total Annual Charge
20 BASTIAN RD	$2,414.27	$27.39	$50.00	$87.15	$2,578.81
30 BASTIAN RD	$1,494.59	$27.39	$50.00	$87.15	$1,659.13
31 BASTIAN RD	$1,717.42	$27.39	$50.00	$87.15	$1,881.96
41 BASTIAN RD	$1,615.86	$27.39	$50.00	$87.15	$1,780.40
44 BASTIAN RD	$1,633.72	$27.39	$50.00	$87.15	$1,798.26
51 BASTIAN RD	$1,569.85	$27.39	$50.00	$87.15	$1,734.39
60 BASTIAN RD	$1,675.98	$27.39	$50.00	$87.15	$1,840.52
65 BASTIAN RD	$2,537.05	$27.39	$50.00	$87.15	$2,701.59
70 BASTIAN RD	$1,637.09	$27.39	$50.00	$87.15	$1,801.63
75 BASTIAN RD	$1,613.54	$27.39	$50.00	$87.15	$1,778.08
86 BASTIAN RD	$1,611.41	$27.39	$50.00	$87.15	$1,775.95
99 BASTIAN RD	$1,594.22	$27.39	$50.00	$87.15	$1,758.76
100 BASTIAN RD	$1,591.25	$27.39	$50.00	$87.15	$1,755.79
110 BASTIAN RD	$1,571.31	$27.39	$50.00	$87.15	$1,735.85
111 BASTIAN RD	$1,575.70	$27.39	$50.00	$87.15	$1,740.24
124 BASTIAN RD	$1,550.81	$27.39	$50.00	$87.15	$1,715.35
129 BASTIAN RD	$1,357.90	$27.39	$50.00	$87.15	$1,522.44
135 BASTIAN RD	$1,518.50	$27.39	$50.00	$87.15	$1,683.04

Address	Annual Debt Service	MCPW Capital Charge	BCSD O & M Charge	MCPW O & M Charge	Total Annual Charge
140 BASTIAN RD	$1,531.76	$27.39	$50.00	$87.15	$1,696.30
150 BASTIAN RD	$1,510.75	$27.39	$50.00	$87.15	$1,675.29
155 BASTIAN RD	$1,519.11	$27.39	$50.00	$87.15	$1,683.65
165 BASTIAN RD	$1,476.51	$27.39	$50.00	$87.15	$1,641.05
166 BASTIAN RD	$1,490.78	$27.39	$50.00	$87.15	$1,655.32
175 BASTIAN RD	$1,357.71	$27.39	$50.00	$87.15	$1,522.25
181 BASTIAN RD	$1,320.03	$27.39	$50.00	$87.15	$1,484.57
191 BASTIAN RD	$1,461.54	$27.39	$50.00	$87.15	$1,626.08
196 BASTIAN RD	$1,450.08	$27.39	$50.00	$87.15	$1,614.62
201 BASTIAN RD	$1,375.30	$27.39	$50.00	$87.15	$1,539.84
206 BASTIAN RD	$1,430.22	$27.39	$50.00	$87.15	$1,594.76
215 BASTIAN RD	$1,364.03	$27.39	$50.00	$87.15	$1,528.57
221 BASTIAN RD	$1,291.71	$27.39	$50.00	$87.15	$1,456.25
222 BASTIAN RD	$2,104.75	$27.39	$50.00	$87.15	$2,269.29
233 BASTIAN RD	$1,406.16	$27.39	$50.00	$87.15	$1,570.70
242 BASTIAN RD	$1,327.31	$27.39	$50.00	$87.15	$1,491.85
243 BASTIAN RD	$1,364.70	$27.39	$50.00	$87.15	$1,529.24
244 BASTIAN RD	$1,314.62	$27.39	$50.00	$87.15	$1,479.16
260 BASTIAN RD	$2,234.86	$27.39	$50.00	$87.15	$2,399.40
265 BASTIAN RD	$2,638.95	$27.39	$50.00	$87.15	$2,803.49
22 HELEN RD	$2,213.63	$27.39	$50.00	$87.15	$2,378.17
34 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
42 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
53 HELEN RD	$4,170.99	$27.39	$50.00	$87.15	$4,335.53
60 HELEN RD	$2,328.54	$27.39	$50.00	$87.15	$2,493.08
73 HELEN RD	$1,401.16	$27.39	$50.00	$87.15	$1,565.70
80 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
81 HELEN RD	$1,241.91	$27.39	$50.00	$87.15	$1,406.45
90 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
95 HELEN RD	$1,630.91	$27.39	$50.00	$87.15	$1,795.45
120 HELEN RD	$2,328.54	$27.39	$50.00	$87.15	$2,493.08
127 HELEN RD	$2,328.54	$27.39	$50.00	$87.15	$2,493.08
130 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
144 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
162 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
163 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
175 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
176 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81

Address	Annual Debt Service	MCPW Capital Charge	BCSD O & M Charge	MCPW O & M Charge	Total Annual Charge
181 HELEN RD	$1,397.13	$27.39	$50.00	$87.15	$1,561.67
188 HELEN RD	$2,328.54	$27.39	$50.00	$87.15	$2,493.08
203 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
210 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
217 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
222 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
227 HELEN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
24 NORMAN RD	$1,180.47	$27.39	$50.00	$87.15	$1,345.01
30 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
36 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
44 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
45 NORMAN RD	$1,261.27	$27.39	$50.00	$87.15	$1,425.81
60 NORMAN RD	$1,166.95	$27.39	$50.00	$87.15	$1,331.49
65 NORMAN RD	$1,700.15	$27.39	$50.00	$87.15	$1,864.69
82 NORMAN RD	$2,332.97	$27.39	$50.00	$87.15	$2,497.51
99 NORMAN RD	$1,792.98	$27.39	$50.00	$87.15	$1,957.52
106 NORMAN RD	$1,645.00	$27.39	$50.00	$87.15	$1,809.54
115 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
124 NORMAN RD	$1,840.02	$27.39	$50.00	$87.15	$2,004.56
131 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
140 NORMAN RD	$1,171.03	$27.39	$50.00	$87.15	$1,335.57
145 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
155 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
160 NORMAN RD	$2,362.72	$27.39	$50.00	$87.15	$2,527.26
171 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
180 NORMAN RD	$1,171.61	$27.39	$50.00	$87.15	$1,336.15
185 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
190 NORMAN RD	$1,174.29	$27.39	$50.00	$87.15	$1,338.83
195 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
202 NORMAN RD	$1,166.60	$27.39	$50.00	$87.15	$1,331.14
209 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
222 NORMAN RD	$1,188.43	$27.39	$50.00	$87.15	$1,352.97
225 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
226 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
228 NORMAN RD	$1,237.56	$27.39	$50.00	$87.15	$1,402.10
239 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
248 NORMAN RD	$1,266.98	$27.39	$50.00	$87.15	$1,431.52
251 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81

Address	Annual Debt Service	MCPW Capital Charge	BCSD O & M Charge	MCPW O & M Charge	Total Annual Charge
262 NORMAN RD	$1,906.73	$27.39	$50.00	$87.15	$2,071.27
267 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
275 NORMAN RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
279 NORMAN RD	$1,170.86	$27.39	$50.00	$87.15	$1,335.40
520 E RIVER RD	$1,914.53	$27.39	$50.00	$87.15	$2,079.07
546 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
560 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
572 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
600 E RIVER RD	$2,984.38	$27.39	$50.00	$87.15	$3,148.92
630 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
722 E RIVER RD	$1,924.74	$27.39	$50.00	$87.15	$2,089.28
756 E RIVER RD	$1,280.70	$27.39	$50.00	$87.15	$1,445.24
770 E RIVER RD	$1,343.10	$27.39	$50.00	$87.15	$1,507.64
786 E RIVER RD	$1,440.79	$27.39	$50.00	$87.15	$1,605.33
800 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
820 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
830 E RIVER RD	$1,164.27	$27.39	$50.00	$87.15	$1,328.81
844 E RIVER RD	$1,196.71	$27.39	$50.00	$87.15	$1,361.25
BASTIAN RD (148.07-1-19)*	$116.43	$27.39	$50.00	$87.15	$280.97
BASTIAN RD (148.07-1-39)*	$116.43	$27.39	$50.00	$87.15	$280.97
BASTIAN RD (148.07-1-11)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-68)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-59)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-70)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-2-15)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-60.2)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-67)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-1-69)*	$116.43	$27.39	$50.00	$87.15	$280.97
HELEN RD (148.07-2-16)*	$116.43	$27.39	$50.00	$87.15	$280.97
NORMAN RD (148.07-2-34)*	$116.43	$27.39	$50.00	$87.15	$280.97

Address	Annual Debt Service	MCPW Capital Charge	BCSD O & M Charge	MCPW O & M Charge	Total Annual Charge
NORMAN RD (148.07-2-31)*	$116.43	$27.39	$50.00	$87.15	$280.97
NORMAN RD (148.07-2-36)*	$116.43	$27.39	$50.00	$87.15	$280.97
500 E RIVER RD (148.07-2-42)*	$116.43	$27.39	$50.00	$87.15	$280.97
E RIVER RD (148.07-1-9)*	$116.43	$27.39	$50.00	$87.15	$280.97
E RIVER RD (148.07-1-52)*	$116.43	$27.39	$50.00	$87.15	$280.97
E RIVER RD (148.07-2-39)*	$116.43	$27.39	$50.00	$87.15	$280.97
E RIVER RD (148.07-1-6)*	$116.43	$27.39	$50.00	$87.15	$280.97
Average =	$1,489.73	$27.39	$50.00	$87.15	**$1,654.27**

In addition to the annual fees referenced in Table VI.1, the property owner will incur the following one-time costs upon connection to the public sewer:

- The abandonment of existing septic tank. This cost is estimated to be $500.
- The installation of service laterals from the right of way to the house. This installation is estimated to cost between $2,500 and $3,500 depending on the length of sanitary sewer lateral installed.
- The cost to reconfigure homes internal plumbing to accommodate the sewer connection.

B. Maximum Affordable Payment

Each year the New York State Comptroller's office publishes average estimated annual cost thresholds for "typical properties" within sewer and water improvement districts. These thresholds serve as an upper limit to the annual cost that can be imposed on a typical property (inclusive of debt, operation and maintenance, and other charges related to the improvements) without seeking special approval from the Comptroller's Office. A dwelling unit as referenced in this study represents a typical property. For Town sewer districts, the NYS Comptroller's average estimated sewer cost threshold for 2014 is $721 per year. New Sewer districts that incorporate annual costs to the typical property that exceed this threshold require the Comptroller's approval. Generally, the Comptroller will approve higher annual costs provided there is substantial support within the special district for the proposed improvement.

The annual unit charge exceeds the $721 per year (in 2014) and the project will require approval from the NYS Comptroller's Office.

Grant funding may be available to reduce the annual cost per unit. This section evaluates amount of grant funding required to reduce the total unit charge to approximately $721. The amount of grant money required was estimated in the following manner:

Step 1- Identify a "target" annual cost per sewer unit. For the purpose of this report, a target of $721 has been established, based on the affordability threshold set by the New York State Comptroller's Office.

Step 2- Determine the portion of the target annual cost that can be applied to capital debt service by subtracting the estimated annual O&M cost per unit from the target annual cost per unit, ($721).

Step 3- Determine the annual revenues generated by the district based upon unit charge calculated in Step 2.

Step 4 Determine the maximum dollar amount ("Maximum Project Capital Cost") that can be financed by multiplying the total annual revenues generated in Step 3 by a capital recovery factor.

This calculation assumes that the "Essentially Level Debt Method" will be utilized, which results in roughly equal annual debt payments over the term of the borrowing.

Step 5- Subtract the value determined in Step 4 from the estimated capital cost of the collection system for the service area. The resulting value is the amount of grant money required to fund the collection system, while limiting the annual cost per user to $721.

Based on the above methodology, the grant funding required for the low pressure system is $1,134,569. The detailed calculations are shown in Table VI.2.

Table VI.2 Required Grant Money Calculation

Service Area	Units	NYS Comptroller Threshold	NYS Comptroller Threshold minus O & M costs	Maximum Project Capital Cost that can be financed based on NYS Comp Threshold - O & M 5% @ 20	Required Collection System Grant Conventional Financing
Westfall Heights	145.21	$721	$557	$1,008,503	**$1,134,569**

C. Wastewater and Sewer Funding Programs

There are a number of public financing programs that may assist in the implementation of wastewater and sanitary sewer improvements in the study area. In some instances, communities may be eligible for funding from more than one program. Brief descriptions of programs that are possible sources of funds are provided below along with information on funding eligibility.

Table VI.3: Funding Programs

Program	**Clean Water Sate Revolving Fund**
Agency	NYS Environmental Facilities Corporation (EFC)
Program Description	Provide low-interest rate financings to municipalities for water pollution control projects including wastewater treatment facilities, sewers, and non-point source projects such as salt storage facilities.
Funding Type	Interest free short term loans with terms up to 3 years and low-interest rate long-term loans with terms up to 30 years.
Eligibility	Municipalities and public financing authorities in New York State
Eligibility Assessment	Projects that protect, maintain or improve water quality. Projects that are ready to proceed are generally funded. Limited funds are available.

Funding Programs (continued)

Program	Clean Water State Revolving Fund Hardship Assistance
Agency	NYS Environmental Facilities Corporation (EFC)
Program Description	Funds municipal wastewater treatment projects where financial hardship exists.
Funding Type	Reduced interest rate financings as low as 0% with terms up to 30 years.
Eligibility	Municipalities with projects under $14 million that serve residential areas.
Eligibility Assessment	Total estimated annual sewer service charge must exceed a target service charge determined by EFC based on median household income.

Program	Small Cities Community Block Grant
Agency	Office for Small Cities
Program Description	Provides grants for community and economic development activities, wastewater and drinking water facilities, housing and public infrastructure projects.
Funding Type	*Annual Round Competition (Public Facilities Category);* Grants up to $400,000 for cities, towns and villages; $600,000 for counties and joint applications (it is reported that the allowable grant amounts may increase in 2008). Public facilities projects will solve problems affecting the public health, welfare and safety. *Economic Development Open Round*; Grants from $100,000 - $750,000 may be requested for projects involving water, wastewater or other infrastructure to create or retain jobs for moderate-income persons (at $15,000 per job created/retained).
Eligibility	Must primarily benefit low-and moderate-income persons, and help correct or prevent health and safety problems, slums or blight.
Eligibility Assessment	Non-entitlement communities, units of local government with a population of less than 50,000 and non-urban counties.

Funding Programs (continued)

Program	**Rural Utilities Service Water and Wastewater Disposal Loan and Grant Program**
Agency	U.S. Department of Agriculture Rural Development
Program Description	Provides loans and grants to water and wastewater facilities and services to low-income communities whose residents face significant health risks with service area populations below 10,000.
Funding Type	Loan terms up to 40 years (typically 38-years). The interest rate is indexed to the Median Household Income of the municipality or service area. Minimum "Poverty Rate" is 4.5%. The "Market and Intermediate" rates vary as per the Federal Financing Rate every three months.
Eligibility	To provide loan and grant funds to water and wastewater projects serving the most financially needy communities. Financial assistance should result in reasonable user costs for rural residents.
Eligibility Assessment	Competition is intense, applications far exceed available funds

Program	**Local Implementation Grants**
Agency	Lake Ontario Coastal Initiative (LOCI)
Program Description	LOCI brings together public/private, grassroots, state and federal agencies in a coordinated, collaborative effort to restore New York's North Coast. Among the projects being funded are wastewater facility plans, sanitary sewer projects, and wastewater treatment plant improvements.
Funding Type	LOCI implementation grants provide funding for new, cooperative and local projects with the potential to measurably improve the Lake Ontario coastal environment. Sources of funds include U.S. EPA, U.S. Dept. of Agriculture, Fish and Wildlife, State and private foundations and other agencies/groups.
Eligibility	Local governmental entities, county departments and agencies, organizations with 501 (c) (3) not-for-profit status, citizen groups working with not-for-profit organizations and educational institutions.
Eligibility Assessment	Program is competitive but funding availability is increasing.

Other agencies such as the US Department of Commerce Economic Development Agency (EDA) and New York Empire State Development provide funding for wastewater and sewer facilities where such projects directly advance economic development. Additionally, New York State's Energy Research and Development Authority can assist in wastewater and sewer projects where energy conservation is an element.

VII. Conclusions and Implementations

A. Conclusions

The sewer conveyance systems, the gravity/pump station system and the low-pressure system described in Section V, Paragraph A and Section V, Paragraph B respectively, are both reliable and effective systems. However, construction, operational and maintenance costs, and impacts on the communities to be served must be considered in the selection of any one of the systems.

The Probable Cost of Construction estimates, Tables V.1 and V.2 reveal that the gravity/pump station system would have the highest capital cost. A comparison of the Annual Operation and Maintenance Cost Estimate demonstrates that the gravity/pump station system will also require more operational funding. Finally, we have completed a cursory financial analysis of both alternatives. This financial analysis, Section VI, indicates that the annual cost for a homeowner occupying a parcel that constitutes 1 unit will be $1,637.21 to install, operate and maintain a conventional gravity/pump station system and $1,328.81 to install, operate and maintain a low pressure system. Regardless of the system selected the anticipated annual cost will exceed the New York State Comptrollers audit and control threshold.

1. Recommended Alternative

As shown in Table V.2, and consistent with the research conducted, the low-pressure sewer system would provide the most affordable cost among the alternative systems that have been considered. The flat topography is not a limiting or costly factor and community impacts are minimal. Design and installations of sewer lines and service connections is relatively simple and the initial expense of the system is below that of the gravity/pump station system. Low pressure systems have been used for decades in communities that faced similar challenges. Therefore, the Town of Brighton recommends that the sewer system best suited for the conditions present in the Westfall Heights neighborhood is the Low Pressure sewer system.

B. Phased Implementation Plan

Before any decisions are made about specifics of the recommended sewer system, timing, or locations for improvements, the community must be involved in the planning process if the public support needed for eventual implementation and success of a sewer plan is to be achieved. This community input should guide decisions about whether or not to provide public sewer systems to the Westfall Heights service area and what types of management structures (i.e., special districts) need to be formed and how the project will be financed. Table VI.1 provides guidelines for the implementation of sanitary sewer improvements in the Westfall Heights neighborhood.

PHASE	DESCRIPTION
1	Implement a community participation program to secure the public input on the desire to install sewers for the Westfall Heights neighborhood and then develop acceptable unit cost thresholds. The public meeting should serve two primary purposes. First, to provide the public with the necessary information so they can develop informed opinions, and to answer any questions that they may have. Second, to provide a forum for public officials to gauge public sentiment and to gather suggestions on future options.
2	If there is public support for the project the funding thresholds should be established and an investigation and identification of potential grants should be completed. The availability of funding and the associated cost per sewer unit will be key elements for this project.
3	Refine capital cost estimates and develop the documentation necessary to formally apply for grant funding. Establish the legal improvement area or special district that is necessary to implement the improvements. The timing of establishments of the improvement district will depend upon the particular funding program being pursued.
4	Once grant funds and financing for the project are secured, develop design and construction documents.
5	Construct project.

C. District Formation

The recommended Low Pressure sewer system will be implemented through the formation of a Town sewer district. In New York State, improvement districts are formed under Articles 12 and 12-a, of the New York Town Law. The following paragraph summarizes the basic procedure for establishing and expanding improvement districts, including sewer districts.

At the Town level, establishment of an improvement district requires, in general: (i) a petition; or (ii) initial town board resolution; (iii) preparation and approval of maps and plans; (iv) a public hearing on notice; (v) final approving resolution; and (vi) approval of State Comptroller (in some cases). Once all of these steps are completed, the new district will be formed.

Appendix A

U.S. Census Bureau Tract Data

U.S. Census Bureau

AMERICAN FactFinder

	Block 1013, Block Group 1, Census Tract 130.01, Monroe County, New York	Block 1032, Block Group 1, Census Tract 130.01, Monroe County, New York	Block 1033, Block Group 1, Census Tract 130.01, Monroe County, New York
Total	166	15	79

1 - 1 of 1

Source: U.S. Census Bureau, 2010 Census.

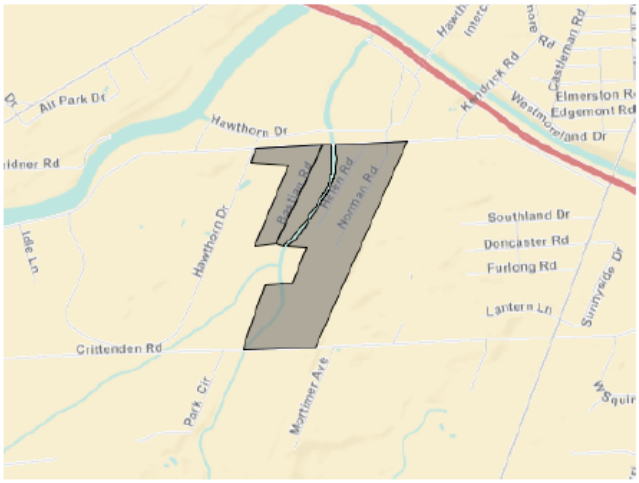
Legend:

Boundaries
- State
- '10 County

Features
- Major Road
- Street
- Stream/Waterbody

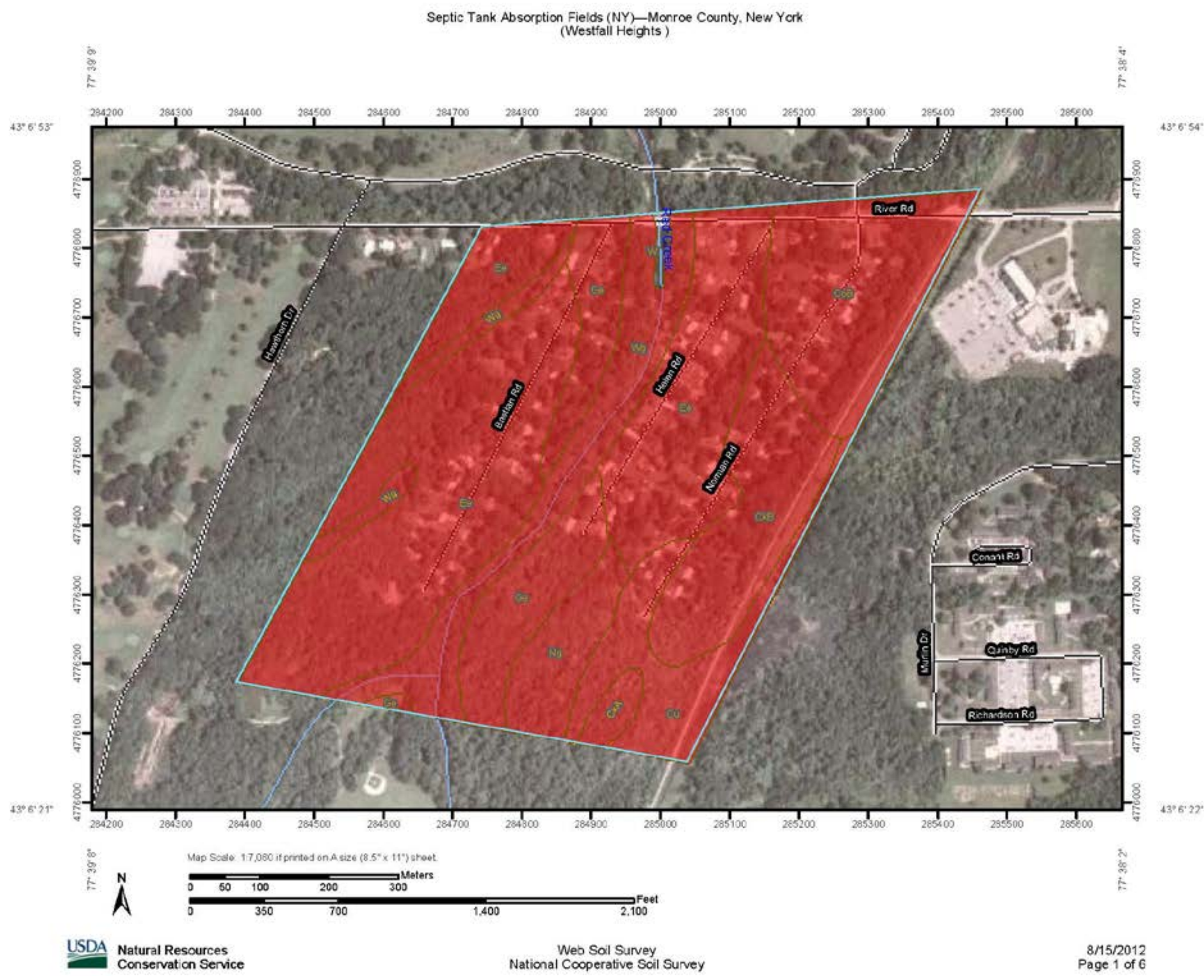
Selection Results
- Selection Results

Items in grey text are not visible at this zoom level



Appendix B

USDA Soil Survey Report



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- Very limited
- Somewhat limited
- Not limited
- not rated or not available

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:7,060 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, New York
Survey Area Data: Version 9, Dec 20, 2011

Date(s) aerial images were photographed: 7/7/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Septic Tank Absorption Fields (NY)

Septic Tank Absorption Fields (NY)— Summary by Map Unit — Monroe County, New York (NY055)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
CkA	Claverack loamy fine sand, 0 to 2 percent slopes	Very limited	Claverack (80%)	Filtering capacity (1.00)	1.5	1.1%
				Depth to saturated zone (0.80)		
				Restricted permeability (0.22)		
CkB	Claverack loamy fine sand, 2 to 6 percent slopes	Very limited	Claverack (80%)	Filtering capacity (1.00)	13.0	10.2%
				Depth to saturated zone (0.80)		
				Restricted permeability (0.22)		
CoB	Colonie loamy fine sand, 0 to 6 percent slopes	Very limited	Colonie (80%)	Seepage (1.00)	17.0	13.2%
				Filtering capacity (1.00)		
Cu	Cosad loamy fine sand	Very limited	Cosad (80%)	Depth to saturated zone (1.00)	9.6	7.5%
				Restricted permeability (0.25)		
Ee	Eel silt loam	Very limited	Teel (80%)	Flooding (1.00)	52.5	40.8%
				Restricted permeability (0.31)		
				Depth to saturated zone (0.80)		
Ge	Genesee silt loam	Very limited	Hamlin (80%)	Flooding (1.00)	12.9	10.1%
				Restricted permeability (0.31)		
				Depth to saturated zone (0.17)		
Ng	Niagara silt loam	Very limited	Niagara (75%)	Depth to saturated zone (1.00)	5.8	4.5%
				Restricted permeability (0.98)		
W	Water	Not rated	Water (100%)		0.5	0.4%
Wg	Wayland silt loam	Very limited	Wayland (75%)	Flooding (1.00)	15.7	12.2%
				Depth to saturated zone (1.00)		
				Restricted permeability (1.00)		
				Ponding (1.00)		
Totals for Area of Interest					**128.5**	**100.0%**

Septic Tank Absorption Fields (NY)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	128.0	99.6%
Null or Not Rated	0.5	0.4%
Totals for Area of Interest	**128.5**	**100.0%**

Description

Septic tank absorption fields are subsurface systems of perforated pipe or similar devices that distribute effluent from a septic tank into the soil. New York State Department of Health regulations allow installation of septic system absorption fields of varying designs, depending upon the depth of suitable soil material above any limitation in the natural soil at a site (New York State Department of Health, 1990). Where necessary, imported fill material may be used to elevate absorption trenches to at least the minimum distance of 24 inches above limiting soil horizons. The depth ranges of suitable material and corresponding types of absorption systems allowed are as follows:

Less than 12 inches-no system allowed

12 to 24 inches-alternative raised trench

24 to 48 inches-conventional shallow trench

More than 48 inches-conventional system

The ratings in this interpretation are based on evaluation of the soil between depths of 12 and 48 inches. In addition, the bottom layer of the soil is evaluated for risk of seepage. This interpretation does not evaluate bedrock below the soil. The soil properties and site features considered are those that affect absorption of the effluent, construction and maintenance of the system, and public health.

The soil properties and qualities that affect the absorption and effective treatment of wastewater effluent are saturated hydraulic conductivity (Ksat), depth to a seasonal high water table, depth to bedrock, depth to dense material, and susceptibility to flooding. Stones and boulders and a shallow depth to bedrock or dense material interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas. In addition, the hazards of erosion and sedimentation increase as slope increases.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 2 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, ground water may be contaminated.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations

Appendix C

Rental Units Table

	Frontage ft	Area beyond 200 foot lot depth acre	Base unit ea	Frontage Unit ea	Area Unit ea	Total Unit ea
20 BASTIAN RD	181.84	0.255	1	0.82	0.26	2.07
30 BASTIAN RD	99.6	0.284	1	0.00	0.28	1.28
31 BASTIAN RD	147.51	0.000	1	0.48	0.00	1.48
41 BASTIAN RD	77.57	0.388	1	0.00	0.39	1.39
44 BASTIAN RD	100	0.403	1	0.00	0.40	1.40
51 BASTIAN RD	77.57	0.348	1	0.00	0.35	1.35
60 BASTIAN RD	100	0.440	1	0.00	0.44	1.44
65 BASTIAN RD	155.14	0.628	1	0.55	0.63	2.18
70 BASTIAN RD	100	0.406	1	0.00	0.41	1.41
75 BASTIAN RD	100	0.386	1	0.00	0.39	1.39
86 BASTIAN RD	100	0.384	1	0.00	0.38	1.38
99 BASTIAN RD	100	0.369	1	0.00	0.37	1.37
100 BASTIAN RD	100	0.367	1	0.00	0.37	1.37
110 BASTIAN RD	100	0.350	1	0.00	0.35	1.35
111 BASTIAN RD	100	0.353	1	0.00	0.35	1.35
124 BASTIAN RD	100	0.332	1	0.00	0.33	1.33
129 BASTIAN RD	50	0.166	1	0.00	0.17	1.17
135 BASTIAN RD	100	0.304	1	0.00	0.30	1.30
140 BASTIAN RD	100	0.316	1	0.00	0.32	1.32
150 BASTIAN RD	100	0.298	1	0.00	0.30	1.30
155 BASTIAN RD	100	0.305	1	0.00	0.30	1.30
165 BASTIAN RD	90	0.268	1	0.00	0.27	1.27
166 BASTIAN RD	100	0.280	1	0.00	0.28	1.28
175 BASTIAN RD	60	0.166	1	0.00	0.17	1.17
181 BASTIAN RD	50	0.134	1	0.00	0.13	1.13
191 BASTIAN RD	100	0.255	1	0.00	0.26	1.26
196 BASTIAN RD	100	0.245	1	0.00	0.25	1.25
201 BASTIAN RD	75	0.181	1	0.00	0.18	1.18
206 BASTIAN RD	100	0.228	1	0.00	0.23	1.23
215 BASTIAN RD	75	0.172	1	0.00	0.17	1.17
221 BASTIAN RD	50	0.109	1	0.00	0.11	1.11
222 BASTIAN RD	150	0.308	1	0.50	0.31	1.81
233 BASTIAN RD	100	0.208	1	0.00	0.21	1.21
242 BASTIAN RD	75	0.140	1	0.00	0.14	1.14
243 BASTIAN RD	90	0.172	1	0.00	0.17	1.17
244 BASTIAN RD	75	0.129	1	0.00	0.13	1.13
260 BASTIAN RD	162.23	0.297	1	0.62	0.30	1.92
265 BASTIAN RD	193.61	0.331	1	0.94	0.33	2.27
22 HELEN RD	190.13	0.000	1	0.90	0.00	1.90
34 HELEN RD	88.73	0.000	1	0.00	0.00	1.00

	Frontage ft	Area beyond 200 foot lot depth acre	Base unit ea	Frontage Unit ea	Area Unit ea	Total Unit ea
42 HELEN RD	48	0.000	1	0.00	0.00	1.00
53 HELEN RD	265	0.932	1	1.65	0.93	3.58
60 HELEN RD	200	0.000	1	1.00	0.00	2.00
73 HELEN RD	100	0.203	1	0.00	0.20	1.20
80 HELEN RD	100	0.000	1	0.00	0.00	1.00
81 HELEN RD	99.92	0.067	1	0.00	0.07	1.07
90 HELEN RD	100	0.000	1	0.00	0.00	1.00
95 HELEN RD	140.08	0.000	1	0.40	0.00	1.40
120 HELEN RD	200	0.000	1	1.00	0.00	2.00
127 HELEN RD	200	0.000	1	1.00	0.00	2.00
130 HELEN RD	100	0.000	1	0.00	0.00	1.00
144 HELEN RD	100	0.000	1	0.00	0.00	1.00
162 HELEN RD	100	0.000	1	0.00	0.00	1.00
163 HELEN RD	90	0.000	1	0.00	0.00	1.00
175 HELEN RD	90	0.000	1	0.00	0.00	1.00
176 HELEN RD	100	0.000	1	0.00	0.00	1.00
181 HELEN RD	120	0.000	1	0.20	0.00	1.20
188 HELEN RD	200	0.000	1	1.00	0.00	2.00
203 HELEN RD	100	0.000	1	0.00	0.00	1.00
210 HELEN RD	100	0.000	1	0.00	0.00	1.00
217 HELEN RD	100	0.000	1	0.00	0.00	1.00
222 HELEN RD	100	0.000	1	0.00	0.00	1.00
227 HELEN RD	100	0.000	1	0.00	0.00	1.00
24 NORMAN RD	43.01	0.014	1	0.00	0.01	1.01
30 NORMAN RD	43.67	0.000	1	0.00	0.00	1.00
36 NORMAN RD	46.85	0.000	1	0.00	0.00	1.00
44 NORMAN RD	97.17	0.000	1	0.00	0.00	1.00
45 NORMAN RD	75	0.083	1	0.00	0.08	1.08
60 NORMAN RD	100.23	0.000	1	0.00	0.00	1.00
65 NORMAN RD	146	0.000	1	0.46	0.00	1.46
82 NORMAN RD	200.38	0.000	1	1.00	0.00	2.00
99 NORMAN RD	154	0.000	1	0.54	0.00	1.54
106 NORMAN RD	141.29	0.000	1	0.41	0.00	1.41
115 NORMAN RD	100	0.000	1	0.00	0.00	1.00
124 NORMAN RD	158.04	0.000	1	0.58	0.00	1.58
131 NORMAN RD	100	0.000	1	0.00	0.00	1.00
140 NORMAN RD	100.58	0.000	1	0.01	0.00	1.01
145 NORMAN RD	100	0.000	1	0.00	0.00	1.00
155 NORMAN RD	100	0.000	1	0.00	0.00	1.00
160 NORMAN RD	198.76	0.042	1	0.99	0.04	2.03
171 NORMAN RD	100	0.000	1	0.00	0.00	1.00
180 NORMAN RD	100.63	0.000	1	0.01	0.00	1.01
185 NORMAN RD	100	0.000	1	0.00	0.00	1.00

	Frontage ft	Area beyond 200 foot lot depth acre	Base unit ea	Frontage Unit ea	Area Unit ea	Total Unit ea
190 NORMAN RD	100.86	0.000	1	0.01	0.00	1.01
195 NORMAN RD	100	0.000	1	0.00	0.00	1.00
202 NORMAN RD	100.2	0.000	1	0.00	0.00	1.00
209 NORMAN RD	100	0.000	1	0.00	0.00	1.00
222 NORMAN RD	100.18	0.019	1	0.00	0.02	1.02
225 NORMAN RD	100	0.000	1	0.00	0.00	1.00
226 NORMAN RD	57.96	0.000	1	0.00	0.00	1.00
228 NORMAN RD	90.38	0.063	1	0.00	0.06	1.06
239 NORMAN RD	100	0.000	1	0.00	0.00	1.00
248 NORMAN RD	89.26	0.088	1	0.00	0.09	1.09
251 NORMAN RD	100	0.000	1	0.00	0.00	1.00
262 NORMAN RD	163.77	0.000	1	0.64	0.00	1.64
267 NORMAN RD	100	0.000	1	0.00	0.00	1.00
275 NORMAN RD	40	0.000	1	0.00	0.00	1.00
279 NORMAN RD	32.18	0.006	1	0.00	0.01	1.01
520 E RIVER RD	164.44	0.000	1	0.64	0.00	1.64
546 E RIVER RD	79	0.000	1	0.00	0.00	1.00
560 E RIVER RD	80	0.000	1	0.00	0.00	1.00
572 E RIVER RD	80	0.000	1	0.00	0.00	1.00
600 E RIVER RD	256.33	0.000	1	1.56	0.00	2.56
630 E RIVER RD	100	0.000	1	0.00	0.00	1.00
722 E RIVER RD	150	0.153	1	0.50	0.15	1.65
756 E RIVER RD	85.78	0.100	1	0.00	0.10	1.10
770 E RIVER RD	115.36	0.000	1	0.15	0.00	1.15
786 E RIVER RD	123.75	0.000	1	0.24	0.00	1.24
800 E RIVER RD	100	0.000	1	0.00	0.00	1.00
820 E RIVER RD	90	0.000	1	0.00	0.00	1.00
830 E RIVER RD	90.38	0.000	1	0.00	0.00	1.00
844 E RIVER RD	101.25	0.015	1	0.01	0.02	1.03
BASTIAN RD (148.07-1-19)*			0.1			0.10
BASTIAN RD (148.07-1-39)*			0.1			0.10
BASTIAN RD (148.07-1-11)*			0.1			0.10
HELEN RD (148.07-1-68)*			0.1			0.10
HELEN RD (148.07-1-59)*			0.1			0.10
HELEN RD (148.07-1-70)*			0.1			0.10
HELEN RD (148.07-2-15)*			0.1			0.10
HELEN RD (148.07-1-60.2)*			0.1			0.10
HELEN RD (148.07-1-67)*			0.1			0.10
HELEN RD (148.07-1-69)*			0.1			0.10
HELEN RD (148.07-2-16)*			0.1			0.10
NORMAN RD (148.07-2-34)*			0.1			0.10
NORMAN RD (148.07-2-31)*			0.1			0.10
NORMAN RD (148.07-2-36)*			0.1			0.10

	Frontage ft	Area beyond 200 foot lot depth acre	Base unit ea	Frontage Unit ea	Area Unit ea	Total Unit ea
500 E RIVER RD (148.07-2-42)*			0.1			0.10
E RIVER RD (148.07-1-9)*			0.1			0.10
E RIVER RD (148.07-1-52)*			0.1			0.10
E RIVER RD (148.07-2-39)*			0.1			0.10
E RIVER RD (148.07-1-6)*			0.1			0.10
*Vacant Lots						**145.21**