FINAL REPORT

SEWER RATE STUDY AND AFFORDABILITY ANALYSIS

B&V PROJECT NO. 407104

PREPARED FOR

City of Cleveland Heights, Ohio

21 MAY 2021

BLACK & VEATCH

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1.0 Introduction

In 2017, the City of Cleveland Heights (City) entered into a Partial Consent Decree with the U.S. Environmental Protection Agency (USEPA) and the Department of Justice (DOJ) (collectively, Regulators), which outlined initial actions, including the requirement to develop an overall program to eliminate separate sewer overflows (SSOs) in its sewer system. To fulfill the key requirements of the Partial Consent Decree, the City is currently engaged in multi-pronged initiatives, including collection system assessments, improvements to its operations and maintenance practices, early priority capital improvement program actions, and the development of its Integrated Overflow Control Master Plan (Master Plan), which will reflect the results of early action work, and outline the remainder of the Master Plan, including a recommended schedule for completion of the first phase of the Master Plan.

The purpose of this Sewer Rate Study and Affordability Analysis report (Report) is to provide information relative to the City's economic condition and financial capability for financing the improvements identified in the Master Plan. The analysis presented herein includes an assessment of the City's economic condition and trends in demographics of the community, a utility financial plan covering all years for the recommended phased plan outlined in the Master Plan, assessment of customer impact for all Clean Water Act (CWA) costs and completion of the USEPA Financial Capability Assessment (FCA) as outlined in USEPA's 1997 and proposed 2021 revised guidance. The resulting Affordability Analysis provides a reference point for continuing discussions of projects, levels of control and timing. ***It should be noted that the analysis included herein was prepared over several months before the City's submission of its Master Plan, and as such, may not fully reflect quickly evolving economic conditions.***

As used throughout the remainder of this Report, the Tier 1 Projects refer to the schedule of projects outlined in the Master Plan for implementation in the next phase of the Master Plan. In addition, the City will need to continue to invest in the overall wastewater collection and pumping assets, and such investment has been incorporated into this analysis. As will be presented herein, it is expected that the City and its customers will experience substantial impact in completing the Tier 1 Projects over the timeframe outlined in the Master Plan.

Subject to the limitations set forth herein, this Report was prepared for the City by Black & Veatch and is based on information not within the control of Black & Veatch. Black & Veatch has not been requested to make an independent analysis, to verify the information provided to it, or to render an independent judgment of the validity of the information provided by others. As such, Black & Veatch cannot, and does not, guarantee the accuracy thereof.

In conducting our analyses and in forming an opinion of the projection of future operations summarized in this Report, Black & Veatch has made certain assumptions with respect to conditions, events and circumstances which may occur in the future. The methodology utilized by Black & Veatch in performing the analyses follows generally accepted practices for such projections. While Black & Veatch believes the assumptions are reasonable and appropriate, and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur that are unknown at this time and/or which are beyond the control of Black & Veatch. Such factors that could impact the projections included in this report include, but are not limited to:

- Projections are based on certain assumptions regarding changes in billed volume due to the COVID-19 pandemic's impact on both residential and nonresidential customer requirements, and longer-term trends toward declining residential volume. If the City experiences declining consumption beyond that included in this analysis, or if the return to pre-pandemic levels is delayed, the result could be further reduced revenues, which could require additional revenue increases. Conversely, if the trend of declining residential volume levelizes, or if nonresidential volumes return to pre-pandemic levels sooner than that projected, the resulting revenue increases may be lower.
- The analysis reflects little change in the City's current delinquency rate on sewer revenues. If the delinquency rate can be reduced, the result would be increased revenues that could lessen required increases.
- The analysis assumes current levels of participation in the City's Homestead and Affordability programs. Increased participation would result in reduced revenues; however, it should be noted that such increased participation could potentially help reduce delinquencies, and as such, partially offset the impact of increased participation.
- Any changes to required additional O&M for the City's Capacity, Management, Operations and Maintenance (CMOM) program would increase total revenue requirements, and require higher revenue increases than that reflected in this Report.
- Changes to the capital program, whether timing and/or cost of projects required under the Master Plan and/or the City's non-Master Plan capital spending, will result in changes to the projected revenue requirements. While the analysis includes an allowance for inflation, increased costs beyond that reflected in the analysis will result in higher costs.

2.0 Economic and Demographic Analysis

The City of Cleveland Heights, Ohio (City) is an inner ring suburb approximately eight miles east of downtown Cleveland, Ohio. The City is primarily residential, with associated commercial businesses supporting the community. As an inner ring suburb, the City is "built out;" however, there are redevelopment activities underway. The City has experienced a continued decline in population, with fewer occupied households and smaller average household size. In its February 26, 2020 Summary Report on Cleveland Heights' general obligation bonds, S&P Global Ratings stated: *"we consider Cleveland Heights' economy weak."* This was prior to the onset of the pandemic. While the City continues to manage both its General Fund and Sewer Utility enterprise fund well, concerns regarding continued population decline and concern about increasing costs, most notably the City's high pension liability, present challenges to the City's financial capability to complete the IOCMP.

The City's Sewer Utility Department is responsible for the maintenance of local sanitary sewer and stormwater systems within the City. Sanitary sewer flow is conveyed to the Northeast Ohio Regional Sewer District (NEORSD or District) Easterly Wastewater Treatment Plan on Lake Erie via the District's Heights Hilltop Interceptor and Doan Valley Interceptor systems. The District is under a consent decree with USEPA, DOJ, Ohio Environmental Protection Agency (OEPA), and the Ohio Attorney General's Office. The District's Project Clean Lake is a 25-year program, required to be completed in 2036. As NEORSD has moved forward with its program, it has been required to increase rates substantially, with projected increases expected to continue to be roughly twice the rate of inflation. As will be discussed further in this Report, the cost incurred by the City's sewer customers for NEORSD services comprises approximately 75% of customers' total CWA costs. The impact of NEORSD's costs to customers significantly impacts the City's financial capacity to complete the Master Plan.

Given the City's economic conditions and outlook, along with the impact of NEORSD rate increases on customer affordability, the City will be challenged in maintaining the financial capability to complete the Master Plan. The City must also ensure that funding is available for on-going asset management beyond that required by the Master Plan, and that beyond its wastewater and stormwater infrastructure commitments, that the City maintain capacity to meet its other needs and obligations.

The following sections provide more specific information concerning key economic and demographic factors affecting the City's financial capability to finance the Master Plan. These sections summarize an analysis of relevant data on economic and demographic conditions in the City, as well as Cuyahoga County, the state of Ohio, and the United States, with particular attention to population and households, income and poverty, and unemployment.

2.1 Population and Household Characteristics

Cleveland Heights is the 26th largest city in Ohio with a population of 44,571[1]. Cleveland Height's population has been consistently declining for at least two decades, and in the last ten years, population has declined at a rate of approximately 0.5% annually (see Figure 1). Cuyahoga County has shown a similar, although slightly less drastic decline in population. The City's and County's decline is in stark contrast to the population trend for the state of Ohio and for the U.S. as a whole, as shown in Figure 2.

[1] American Community Survey, 2019 5-year average.

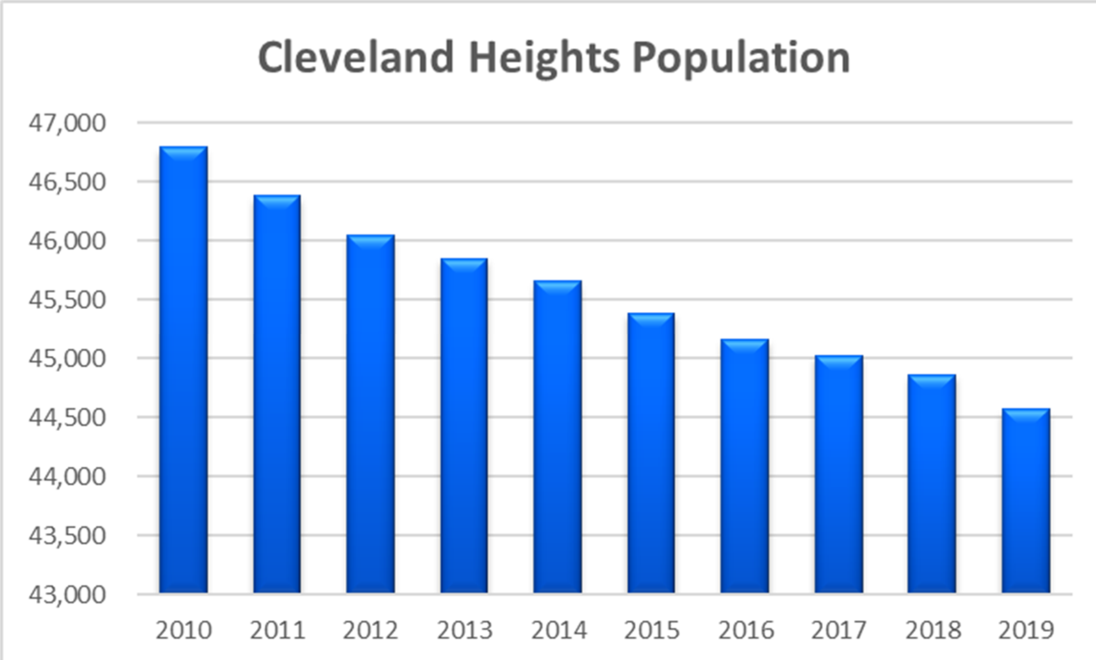

Figure 1 Cleveland Heights Population, 2010-2019 (American Community Survey, 5-year estimates)

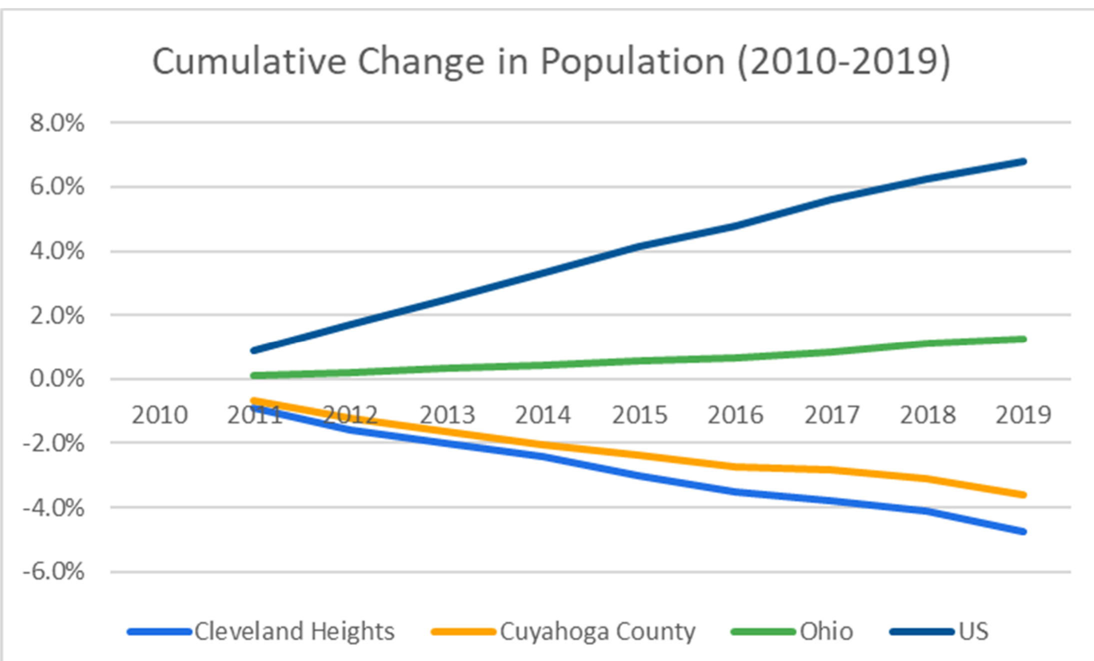

Figure 2 Population Growth Trends, 2010-2019 (American Community Survey, 5-year estimates)

The decline in population is related to both a decline in the number of occupied households as well as a decline in the size of households. The number of occupied households has been declining steadily with an average annual decline rate of 0.3% and an overall decline rate of 2.4% from 2010 to 2019, reaching 19,074[2] occupied households as of 2019 (see Figure 3). As shown in Figure 4, currently over 36% of the City's households represent one person households, with the percentage of single person households growing significantly over the past three years. An additional 34% of households are 2-person households. Overall, the average size of households in the City as of 2019 is 2.08 people, a decline of almost 10% from 2.31 in 2010.

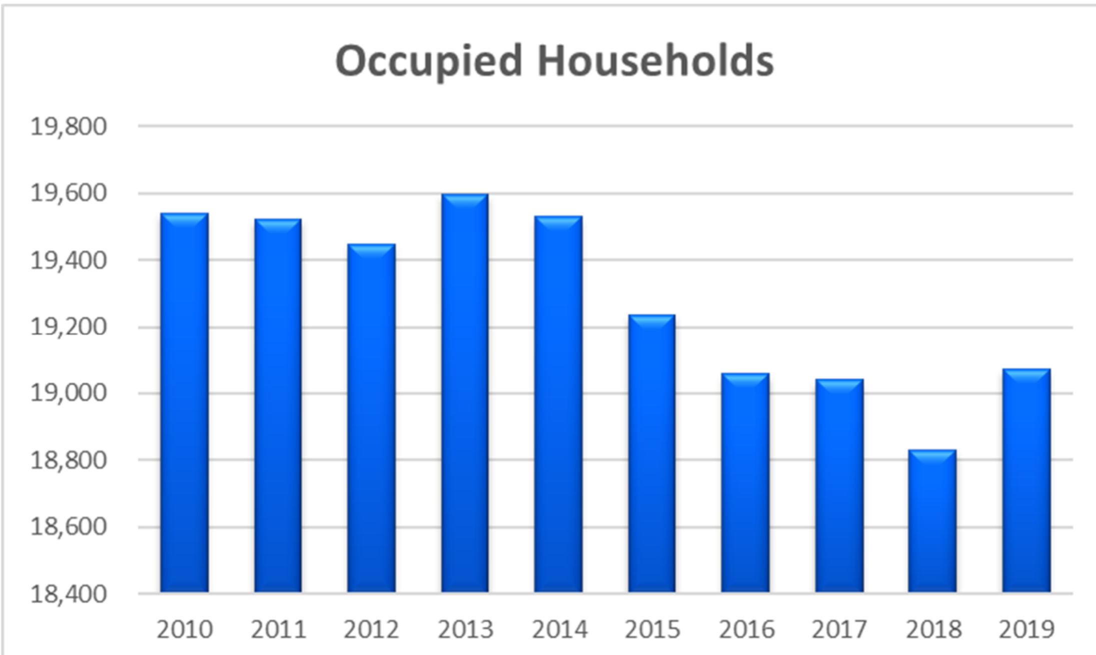

Figure 3 Occupied Households, 2010-2019 (American Community Survey, 5-year estimates)

[2] American Community Survey, 2019 5-year estimates.

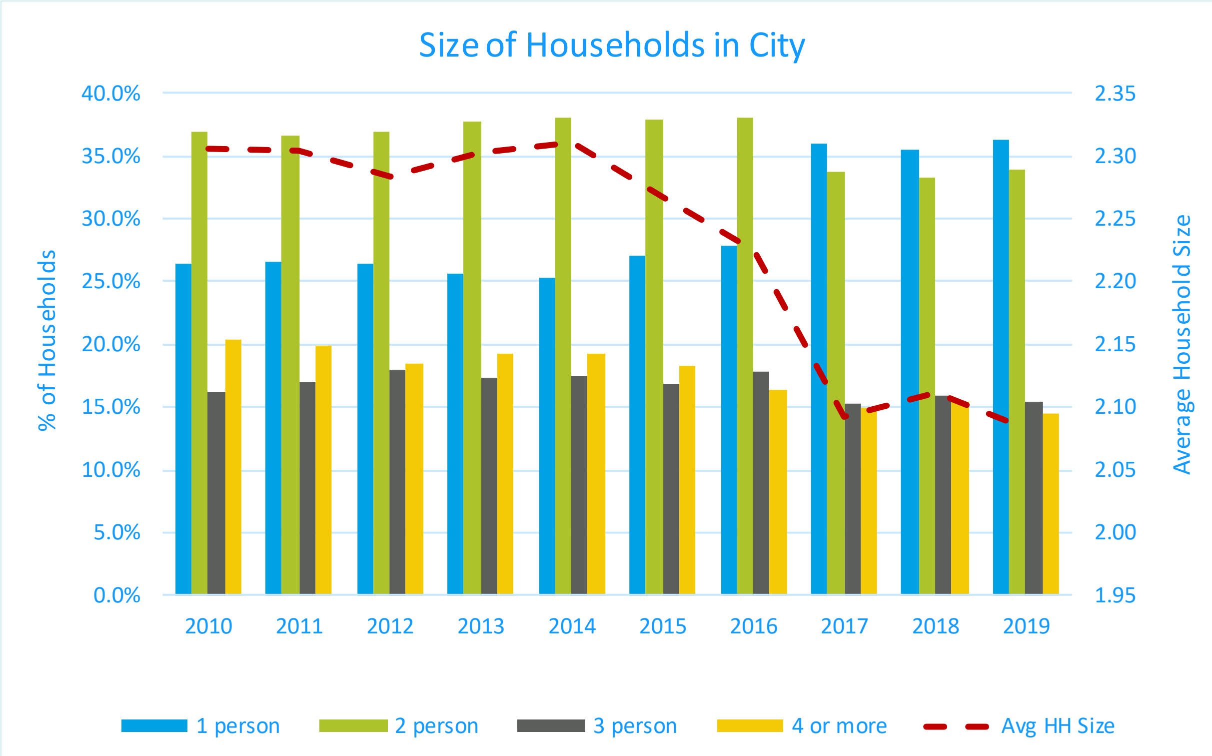

Figure 4 Household Size, 2010-2019 (American Community Survey, 5-year estimates)

The combined effect of declining number of occupied households as well as smaller household size has a significant impact on sewer utility revenues, with the trend resulting in a reduction in the number of residential customers and declining volume per residential customer. There is no indication that such trend will reverse in the near-term, and as such, needs to be taken into consideration in evaluating the sewer utility's projected revenues.

2.2 Median Household Income

The median household income (MHI) in Cleveland Heights is $57,768[3], increasing approximately 18.6% from 2010 to 2019 (cumulative increase). While this level of income growth is slightly less than MHI growth for the U.S. over the same period of 21.1%, Cleveland Height's MHI remains lower than that for the U.S. as a whole, with the gap actually growing from 6% in 2010 to 8% in 2019 (see Table 1) .

Table 1 National and Local MHI Trends

	2010	2015	2019
United States	$51,914	$53,889	$62,843
City of Cleveland Heights	$48,717	$53,014	$57,768
Cleveland Heights % above/below U.S.	-6%	-2%	-8%
Source: US Census Bureau, American Community Survey, 5-year estimates.			

[3] American Community Survey, 2019 5-year Average.

Figure 5 presents a summary of change in MHI for the City, Cuyahoga County, state of Ohio and the U.S., illustrating that while MHI has generally increased over the 10-year period, the City's MHI remains below that of the U.S., with the gap widening over the last five years. MHI for the County and Ohio as a whole are both substantially lower than the U.S.

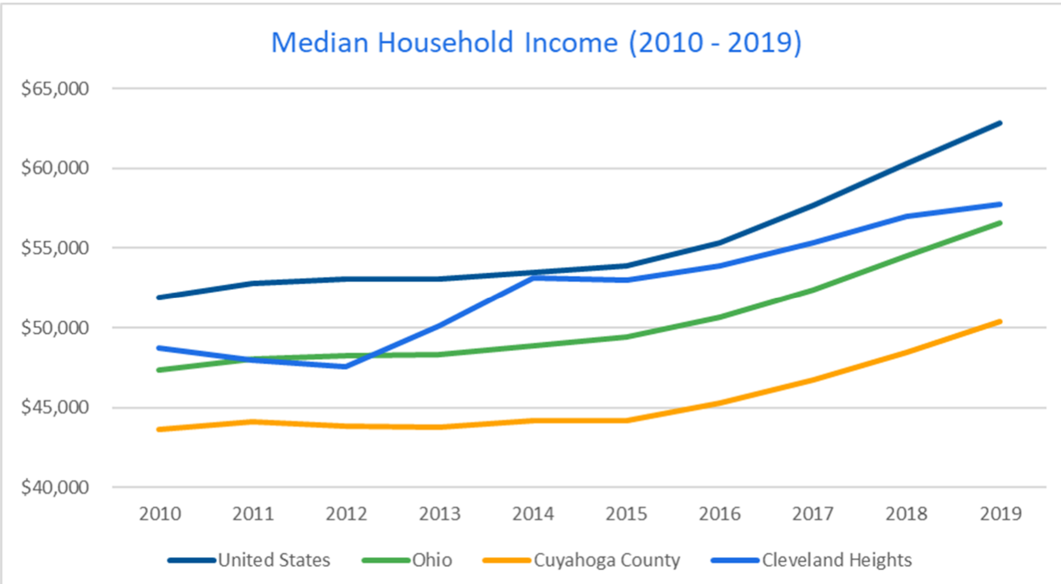

Figure 5 Median Household Income Trends, 2010-2019 (American Community Survey, 5-year estimates)

While the overall MHI for a community is a measure commonly used as an initial indication of a community's "wealth," it is a high-level indicator at best. Within the City, income varies significantly, as shown in Figure 6. The map shows MHI at the census tract level. As shown, MHI ranges from $24,883 to $129,643. Census tracts with an MHI below the U.S. MHI of $62,843 are shown in orange, red or purple. Nearly half of the census tracts have a MHI below that of the U.S.

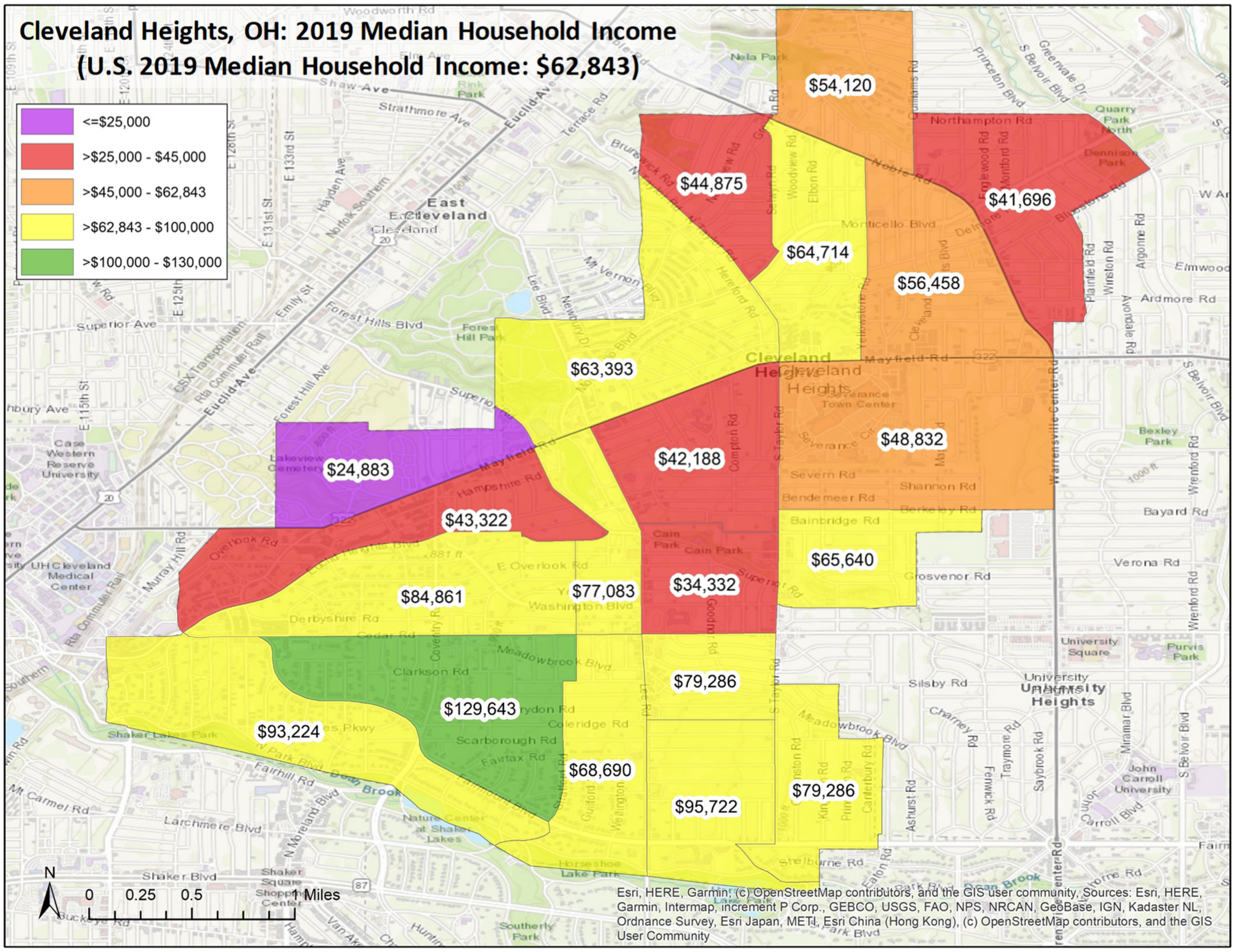

Figure 6 City of Cleveland Heights Median Household Income, by Census Tract (American Community Survey, 2019 5-year estimates)

2.2.1 Income by Quintile

While USEPA relies on MHI for comparisons with other communities, MHI does not provide adequate understanding of the distribution of income within the City, and therefore, does not provide adequate understanding of the impact that the Master Plan could have on households.

Table 2 summarizes the upper limit of income by quintile, meaning the **top** income of households within the relevant 20% of households. As shown, Cleveland Heights's income levels fall below that for the U.S. (5-17% lower) for all quintiles. Cleveland Heights's income at each quintile is 1-16% higher than that for the state of Ohio and Cuyahoga County with the exception of the lowest quintile as compared to Ohio State (about 10% lower).

Table 2 Income by Quintile

Quintile Upper Limits:	Cleveland Heights	Cuyahoga County	State of Ohio	United States
Lowest Quintile	$21,260	$19,146	$23,712	$25,766
Second Quintile	$45,197	$38,873	$44,719	$49,390
Third Quintile	$73,117	$63,691	$70,639	$78,919
Fourth Quintile	$117,996	$106,537	$110,927	$126,609
Lower Limit of Top 5 Percent	$228,328	$208,842	$198,439	$239,367
Sources: American Community Survey 2019 5-year estimates.				

Within the City, there is wide disparity in income at the lowest quintile, similar to the analysis of MHI at the census tract level. Figure 7 provides an illustration of the variation in Lowest Quintile Income-Upper Limit (LQI) throughout the City, as represented by Lowest Quintile by Census tract. As Figure 7 shows, more than half of Cleveland Heights's census tracts (those in purple, red and orange) have an LQI below the U.S. LQI of $25,766.

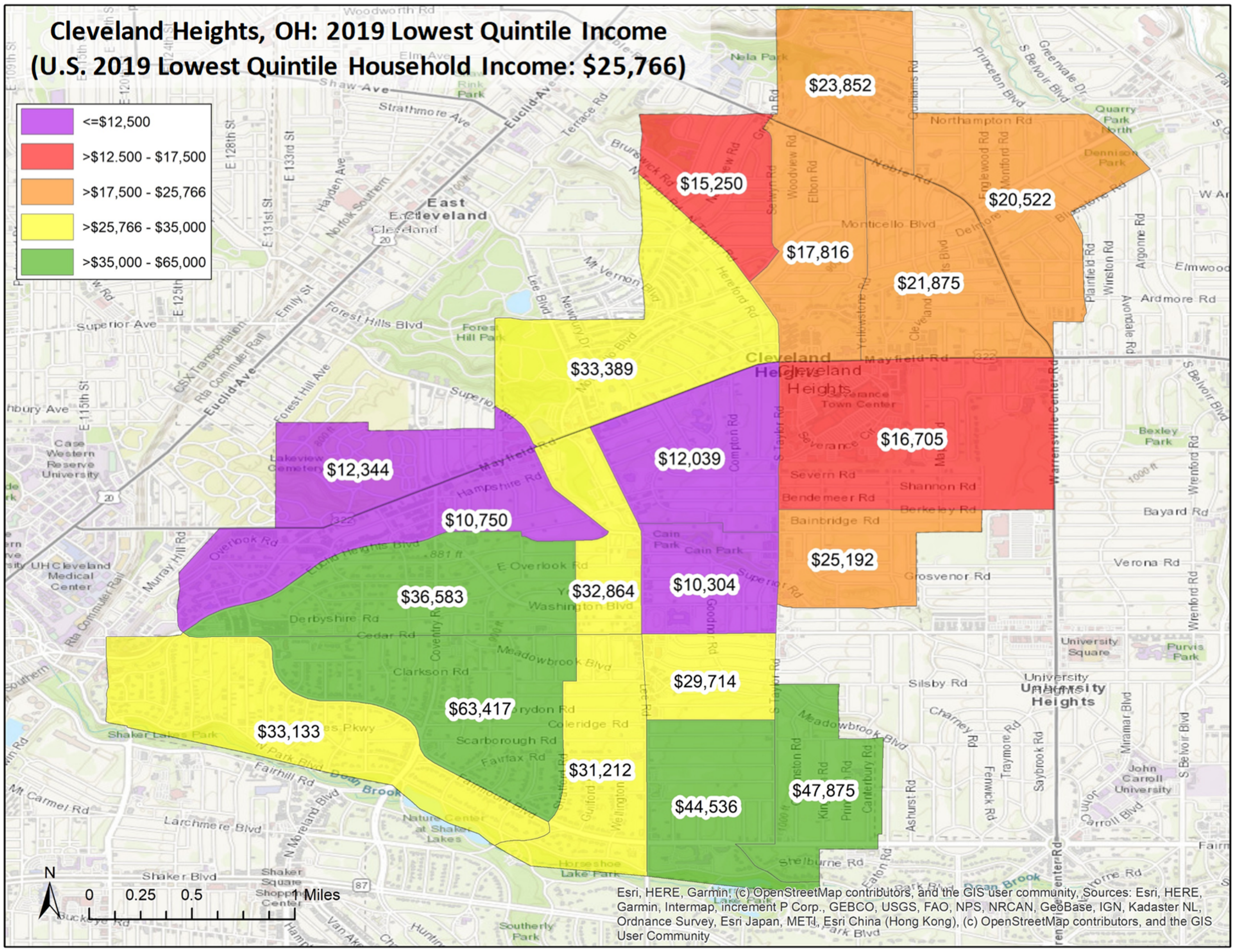

Figure 7 City of Cleveland Heights Lowest Quintile (Upper Limit), by Census Tract (American Community Survey, 2019 5-year estimates)

2.3 Poverty Rate

While the City's MHI is only slightly below that for the U.S., the City's poverty rate (18.2%[4]) exceeds the overall national rate of 13.4%[5] by 35.8%. Over the past 10 years, the City's poverty rate has consistently remained higher than that of the City, ranging from 16.7% to 38.4% higher, averaging 30.4% over the 10-year period.

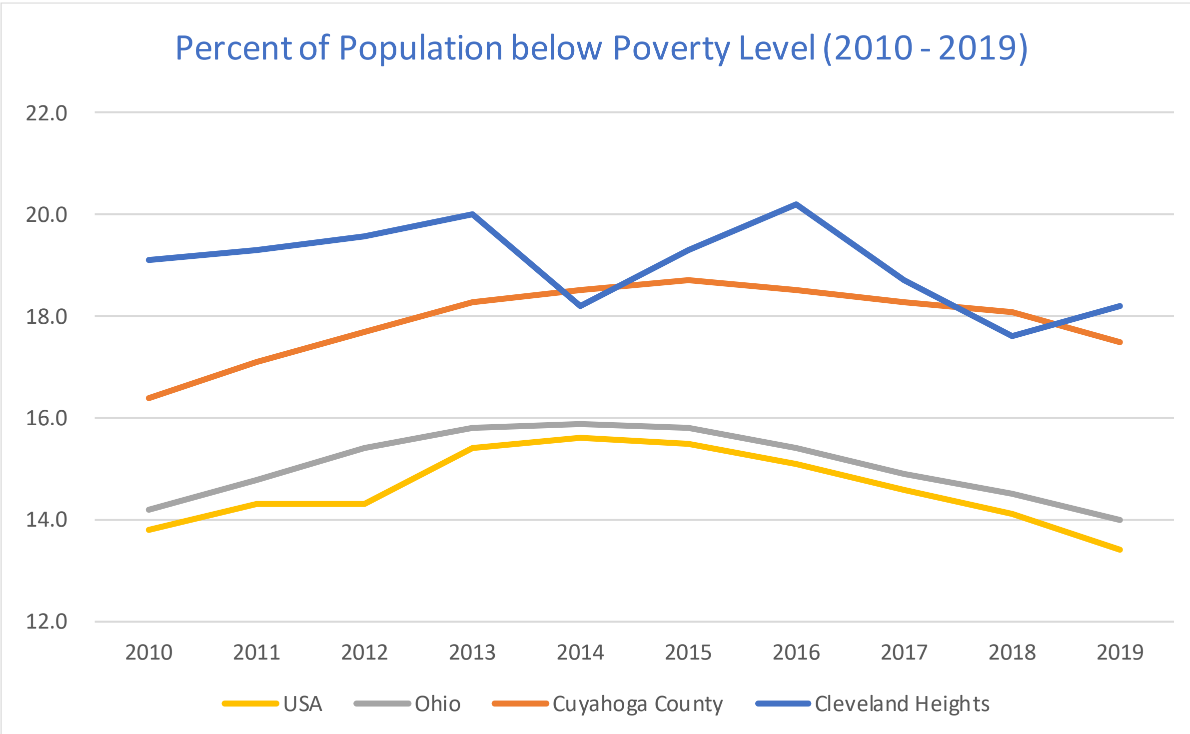

Figure 8 Percent of Population below Poverty Level (2010-2019), (American Community Survey, 2019 5-year estimates)

2.4 Unemployment Rate

Unemployment is a factor utilized in USEPA guidance as an important factor in determining a community's financial capability to complete the requirements of a consent decree. The unemployment rate reflects the community's economic condition as well as a significant segment of the population who face difficult economic conditions and thus would be expected to have difficulty in paying increased sewer costs. In the past 10 years, the City's unemployment rate has exceeded that of the U.S. as a whole (see Figure 9), with the most recent data indicating the City's unemployment at 6.9%[6], 30.2% higher than the U.S. unemployment rate of 5.3%[7]. The analysis of data for the City and the U.S. over the past 10 years illustrates that the City's unemployment rate has consistently remained higher than that of the U.S., ***averaging 10.5% higher over the 10 years***.

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[4] American Community Survey, 2019 5-year estimates.

[5] American Community Survey, 2019 5-year estimates.

[6] American Community Survey, 2019 5-year estimates.

[7] American Community Survey, 2019 5-year estimates.

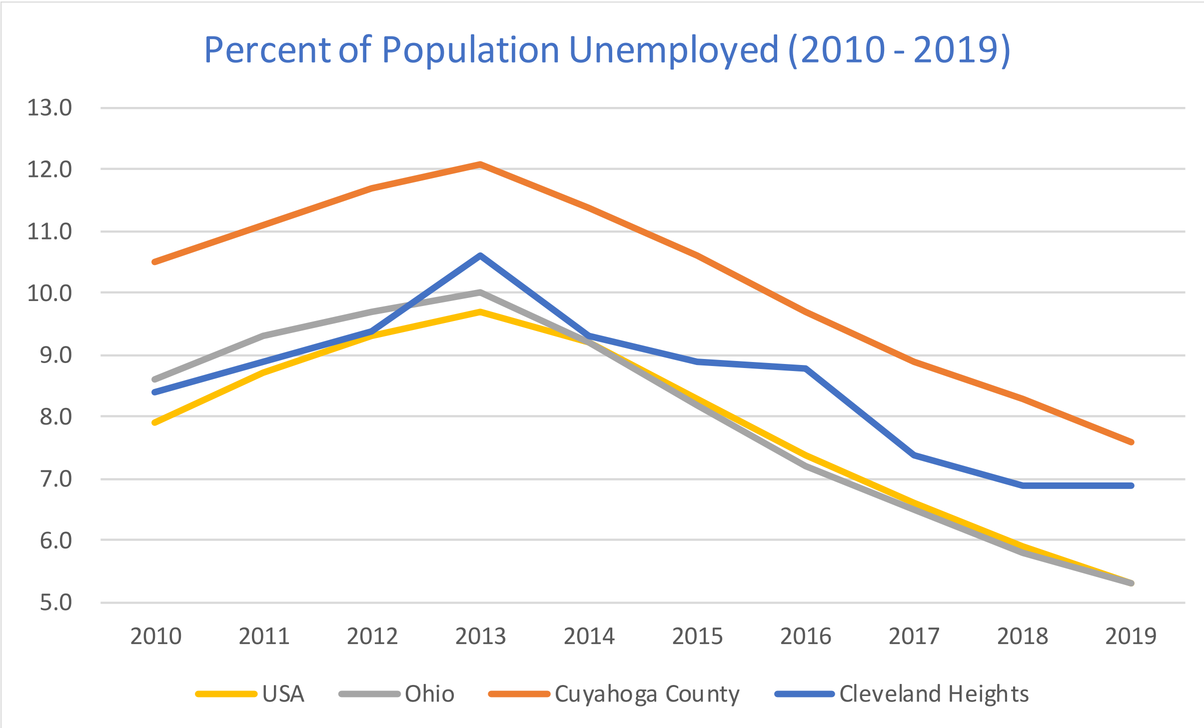

Figure 9 Unemployment Trends, 2010-2019 (American Community Survey, 5-year estimates)

2.5 Conclusion of Economic and Demographic Analysis

While at first review of the City's MHI it may appear that the City is in good shape economically, a closer evaluation of the City's economic condition and demographics reflects that the City has had continual decline in population, number of occupied households, and household size. For the City's Sewer Utility, this means a continuation of declining billed volume that the City has been experiencing, and associated declining revenue under existing rates.

In addition to the impact of declining population on the community, compared to the U.S., the City has consistently experience higher poverty rates and unemployment rates. Rating agencies have recognized the City's economic condition, as noted in S&P Global Ratings' 2020 report on the City's general obligation bonds, indicating that they consider the City's economy "weak." As such, the projects outlined in the Master Plan must be scheduled such as to manage the impact of increasing rates on customers.

3.0 Impact of All Clean Water Act Costs

This analysis includes the determination of impact of ALL Clean Water Act (CWA) costs on the customers served by the City. This includes not only the City's Sewer Utility bill, but also the bill that the City's customers pay directly to NEORSD. As discussed in Section 2 of this Report, NEORSD provides major conveyance and treatment of all wastewater from the City. NEORSD bills customers monthly, based on a three-part rate structure that includes a fixed charge, volume charge based on water usage,[8] and a stormwater charge based on impervious area.[9] In the development of the Master Plan, it is critical that the City reflect "affordability" with customers' full CWA cost burden in mind, not just the City's. As shown in Figure 10, the City's Sewer Utility bill comprises approximately 26% of a residential customers' total cost of CWA related services. The remaining 74% of cost is for major conveyance and treatment services provide by NEORSD. As NEORSD continues with the completion of its long-term control plan "Project Clean Lake" required under their consent decree, it projects continued rate increases in excess of inflation. As such, it is important that the full impact of CWA burden is reflected in the determination of customer burden.

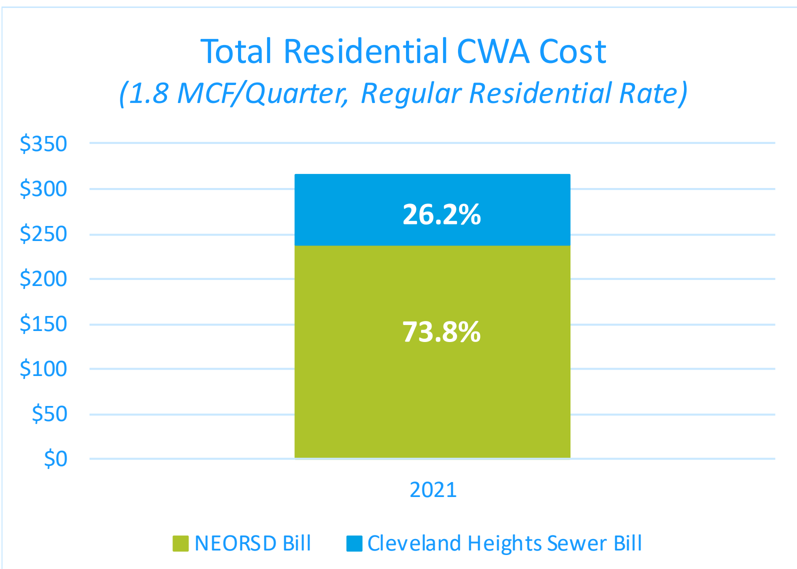

Figure 10 Typical Residential Customer Quarterly CWA Cost

[8] Customers enrolled in the District's Summer Sprinkling Program are billed based on the customers' winter quarter average volume.

[9] Residential customers are billed on a Tiered Rate basis, with tier assigned based on the customer's impervious area.

4.0 Financial Capability Analysis

The City is required to complete a Financial Capability Assessment (FCA), as outlined in the USEPA's "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development" (1997 Guidance). The 1997 Guidance[10], with expansions made in the 2012 integrated planning approach and clarifications provided in the 2014 FCA Framework, uses a two-phase approach to evaluate a permittee's financial capability to complete the Master Plan. Most recently, USEPA released a pre-publication notice in January 2021, outlining USEPA's 2021 Financial Capability Assessment Guidance (2021 Guidance). Incorporation of additional factors outlined in the 2021 Guidance, and expanded FCA matrix is included in this Report as "Phase 3" component of FCA analysis.

This document provides an overview of the preliminary outcomes from using this methodology. In summary, Phase 1 measures the impact of the Master Plan costs on individual households (Residential Indicator, or RI) and Phase 2 measures the debt, socioeconomic and financial conditions of a permittee (Financial Capability Indicators, or FCIs). Figure 11 provides an overview picture of the methodology.

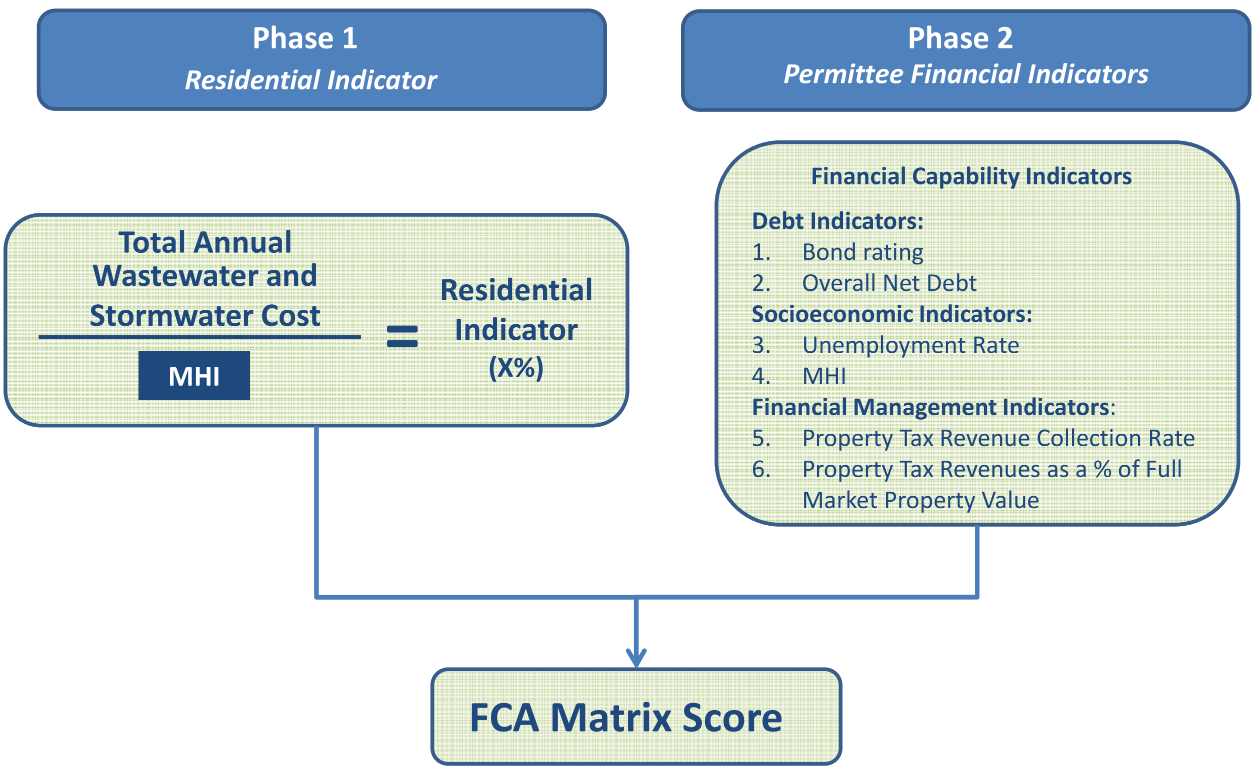

Figure 11 Schematic of USEPA Financial Capability Analysis

[10] https://www3.epa.gov/npdes/pubs/csofc.pdf

4.1 Phase 1 - Residential Indicator

Household income and Master Plan costs are used to calculate the RI for households served by the City, intended to provide a "snapshot" of the impact on residential customers in completing required improvements in the Master Plan. According to the 1997 Guidance, an RI above 2.0% of median household income (MHI) is considered "high" financial impact by USEPA and provides one of the measures the USEPA uses to determine a permittee's overall level of burden, as shown in Table 3. In the proposed 2021 FCA Guidance, USEPA also includes a Lowest Quintile Residential Indicator (LQRI) as well as recognizes that additional income considerations are also appropriate in evaluating burden on the community.

Table 3 Categorization of Residential Indicator per EPA Guidance

Financial Impact	Residential Indicator (Cost per Household as % MHI or other metric)
Low	Less than 1.0 Percent MHI
Mid-Range	1.0 – 2.0 Percent MHI
High	Greater than 2.0 Percent MHI

4.1.1 Residential Indicator (RI)

The City has calculated the Residential Indicator (RI) for the full Program, as required under the 1997 Guidance. Table 4 summarizes the calculation of the RI for the full program, estimated at $565 million. Because the magnitude of the full program is such that it is impossible to estimate the number of years that might be required to complete all projects, it is not possible to incorporate associated asset management capital projects for the appropriate time period in the calculation of RI. Therefore, this analysis underestimates the RI for the full program, the extent to which is dependent upon the number of years required to complete all Master Plan projects. Likewise, it is not possible to determine a projected mix of cash and debt for completion of the Master Plan projects, or project the burden of future NEORSD costs beyond that assumed in the calculation of the Tier 1 RI (discussed below). Therefore, the average annual cash financed capital projected for the analysis of the Tier 1 RI is used in this analysis, and NEORSD cost per household is that assumed for the Tier 1 RI. Nonetheless, as shown in Table 4, ***the calculated RI for the entire Master Plan is at least 5.55%, with the actual calculated RI expected to be even higher, as discussed.*** This level of impact is economically infeasible under any foreseeable timeframe.

Table 4 Residential Indicator (All Master Plan Costs)

Worksheet 1 COST PER HOUSEHOLD (2019 dollars) - All IOCMP Costs		
Line No.		
	Current Costs	
100	Annual Operations and Maintenance Expenses (excluding Depreciation)	$ 4,649,617
100a	Cash Financed Capital	$ -
101	Annual Debt Service (Principal and Interest)	$ 1,618,952
102	* Subtotal * (Line 100 + Line 100a + Line 101)	$ 6,268,569
	Projected LTCP Costs (Current Dollars)	
103	Estimated Additional Annual Operations and Maintenance Expenses (Excluding Depreciation)	$ 374,000
103a	Cash Financed Capital	$ 2,078,765
104	Annual Debt Service (Principal and Interest)	$ 34,795,000
105	* Subtotal * (Line 103 + Line 104)	$ 37,247,765
106	Total Current and Projected WWT and CSO Costs (Line 102 + Line 105)	$ 43,516,334
107	Residential Share of Total WWT and CSO Costs	$ 35,340,038
107a	Residential Share	81.2%
108	Total Number of Households in Service Area	19,074
109	Cost Per Household (Line 107 / Line 108)	$ 1,852.79

Worksheet 2 RESIDENTIAL INDICATOR - All IOCMP Costs		
Line No.		
	Median Household Income (MHI)	
201	Census Year MHI	$ 57,768
202	MHI Adjustment Factor	0.00%
203	Adjusted MHI (Line 201 x Line 202)	$ 57,768
204	Annual WWT and CSO Control Cost Per Household (CPH) (Line 109)	$ 1,853
204a	NEORSD Est. Cost per HH	$ 1,353
204b	Total Cost per Household	$ 3,206
	Residential Indicator	
205	Annual Wastewater and CSO Control Costs per Household as a percent of Adjusted Median Household Income (CPH as % MHI) (Line 204 / Line 203 x 100)	5.55%

As the total cost of the entire Master Plan is well beyond the financial capability of the City, the City can only commit to completing all Tier 1 projects over a 15-year schedule, by the end of 2036. The RI for the City's Tier 1 Projects has been calculated, as shown in Tables 5 and 6 (Worksheet 1 and Worksheet 2). Table 5 reflects the City's Sewer Utility costs only, and also reflects only Tier 1 Project costs. Table 6 calculates the RI including both the City's Sewer Utility costs and NEORSD costs, reflecting known Clean Water Act (CWA) costs anticipated during the completion of the IOCMP[11]. The City's Sewer Utility costs include current costs as well as the cost per household associated with the estimated Master Plan costs for Tier 1 Projects only, CMOM capital and operating costs, and on-going system renewal/replacement, as shown in Table 5. Residential Share, shown on Line 107a, reflects billed volume for the Residential, Homestead and Affordability customer classes. The calculation does not include an allocation of Infiltration/Inflow (I/I), as such data is not available.

Because the City does not have the data necessary to calculate an RI for NEORSD using USEPA Guidance, NEORSD's costs are estimated based on the current average annual residential NEORSD bill, based on 1.8 MCF/quarter.[12] Use of NEORSD's current rates and a calculated annual residential bill understate the burden of NEORSD's full program on customers and therefore the calculated RI on Table 5 is lower than what would be expected to be calculated if the RI were calculated using USEPA Guidance.

[11] Does not include costs of future increased regulations.

[12] Calculated average residential volume per Cleveland Heights' billing records.

Table 5 U.S. EPA FCA Worksheet 1 (Tier 1 Projects Only)

Worksheet 1 COST PER HOUSEHOLD (2019 dollars) - Tier 1 Projects Only			
Line No.			
	Current Costs		
100	Annual Operations and Maintenance Expenses (excluding Depreciation)	$	4,649,617
100a	Cash Financed Capital (2)	$	-
101	Annual Debt Service (Principal and Interest) (3)	$	1,618,952
102	* Subtotal * (Line 100 + Line 100a + Line 101)	$	6,268,569
	Projected LTCP Costs (Current Dollars)		
103	Estimated Additional Annual Operations and Maintenance Expenses (Excluding Depreciation) (4)	$	374,000
103a	Cash Financed Capital	$	2,078,765
104	Annual Debt Service (Principal and Interest) (5)	$	2,580,000
105	* Subtotal * (Line 103 + Line 104)	$	5,032,765
106	Total Current and Projected WWT and CSO Costs (Line 102 + Line 105)	$	11,301,334
107	Residential Share of Total WWT and CSO Costs (6)	$	9,177,923
107a	Residential Share (7)		81.2%
108	Total Number of Households in Service Area (8)		19,074
109	Cost Per Household (Line 107 / Line 108)	$	481.17

(1) 2019 Audited Financial Statement.

(2) Cash financed capital shown in Line 103a.

(3) 2019 Audited Financial Statement.

(4) Estimated additional O&M required, per City, beginning 2022.

(5) Debt financed portion of program, assuming 30 year revenue bonds, equal annual principal and interest payments at 4.5% interest rate, 1.0% issuance expenses.

(6) Line 106 times Line 107a.

(7) Percentage is based on 2019 billing data and is the portion of billable volume attributed to residential customers (Residential, Homestead, Affordability). Excludes any large master metered apartment buildings that are billed as commercial, due to inability to identify such customers in billing data. Therefore, this calculation underestimates the true Residential Share.

(8) American Community Survey, 2019 5-Year Survey, total occupied households, Cleveland Heights City

Table 6 U.S. EPA FCA Worksheet 2 (Tier 1 Projects Only)

Worksheet 2 RESIDENTIAL INDICATOR - Tier 1 Projects Only		
Line No.		
	Median Household Income (MHI)	
201	Census Year MHI [(1)]	$ 57,768
202	MHI Adjustment Factor [(2)]	0.00%
203	Adjusted MHI (Line 201 x Line 202)	$ 57,768
204	Annual WWT and CSO Control Cost Per Household (CPH) (Line 109)	$ 481
204a	NEORSD Est. Cost per HH [(3)]	$ 1,353
204b	Total Cost per Household	$ 1,834
	Residential Indicator	
205	Annual Wastewater and CSO Control Costs per Household as a percent of Adjusted Median Household Income (CPH as % MHI) (Line 204 / Line 203 x 100)	3.17%

(1) American Community Survey, 2019 5-Year Survey.

(2) None.

(3) Estimated annual residential bill in 2036, last year of NEORSD consent decree.

Based on the parameters described above and the Master Plan Tier 1 Projects, the calculated RI is 3.17%. ***While this analysis reflects Tier 1 Projects only, as shown, the calculated RI is still substantially above the 2% threshold USEPA has established for "high impact."*** While the RI is insufficient to understand the true impact on households served by the City, the outcome of this analysis demonstrates that based on USEPA's guidance, ***the Master Plan Tier 1 projects alone result in an extremely high burden on customers***.

4.2 Phase 2 – Financial Capability Indicators (FCI)

The second phase outlined in the 1997 Guidance involves the calculation of six financial indicators intended to determine the community's financial capability for financing required improvements. The six factors outlined in USEPA's Guidance include:

Debt Indicators:

1. Bond rating
2. Overall net debt

Socioeconomic Indicators:

3. Unemployment rate
4. Median Household Income (MHI)

Financial Management Indicator:

5. Property Tax Revenue Collection Rate
6. Property Tax Revenues as a % of Full market property value

Each indicator is scored as "Weak," "Mid-range," or "Strong" and assigned a value of 1, 2 or 3, respectively.

The Financial Capability Indicators (FCI) have been calculated for based on the 2019 and 2020 data (most recent data available) at the time of the analysis. This assessment is based on available and appropriate audited financial data and data obtained from City official statements. The following is a brief summary of each of the indicators used in the USEPA FCI analysis.

In addition to the evaluation of the financial capability indicators included in the USEPA FCA, additional factors have been evaluated for reference in determining a more appropriate FCI score for the City.

4.2.1 Debt Indicators

4.2.1.1 Worksheet 3: Bond Rating

The City does not currently have any outstanding Sewer Utility debt, and therefore, the rating for the Bond Rating FCI is based on the City's most recent General Obligation (G.O.) bond rating. As shown in Table 7, the City's current G.O. bond rating is Aa3, which places the City in USEPA's ***"Strong"*** category for this rating. However, the current bond rating does not reflect the impact the Master Plan will have on the City's financial condition. Because the City will need to fund most of the Master Plan with revenue bonds as opposed to G.O. bonds, the City will need to raise rates sufficiently to achieve the financial indicators required to receive a comparable bond rating as the City holds for currently for G.O. bonds, in order to provide for the lowest available interest rates.

Table 7 USEPA FCA Worksheet 3 (Bond Rating)

Line No.	Worksheet 3 BOND RATING	
	Most Recent General Obligation Bond Rating	
	Date:	2020
	Rating Agency:	Moody's
301	Rating:	Aa3
	Most Recent Revenue (Water/Sewer or Sewer) Bond	
	Date:	N/A
	Rating Agency:	N/A
	Bond Insurance (Yes/No)	
302	Rating:	N/A
303	Summary Bond Rating:	N/A

4.2.1.2 Worksheet 4: Overall Net Debt as Percent of Full Market Property Value

Table 8 summarizes Worksheet 4, Overall Net Debt as a Percent of Full Market Property Value. Per the 1997 Guidance, direct net debt excludes state revolving fund loans, as those are paid by sewer revenues.

Table 8 USEPA FCA Worksheet 4 (Overall Net Debt as a Percent of Full Market Property Value)

Line No.	Worksheet 4 OVERALL NET DEBT AS A PERCENT OF FULL MARKET PROPERTY VALUE		
401	Direct Net Debt (G.O. Bonds Excluding Double-Barreled Bonds) (1)	$	18,324,700
402	Debt of Overlapping Entities (Proportionate Share of Multijurisdictional Debt) (2)	$	175,620,288
403	Overall Net Debt (Lines 401 + 402)	$	193,944,988
404	Market Value of Property (3)	$	2,415,785,902
405	Overall Net Debt as a Percent of Full Market Property Value (Line 403 divided by Line 404 x 100)		8.0%

(1) 2019 Cleveland Heights CAFR.

(2) 2019 Cleveland Heights CAFR.

(3) 2019 Cleveland Heights CAFR.

The resulting calculation of total direct and overlapping debt as percentage of real property value is 8.0%, placing the City in USEPA's ***"Weak"*** rating category.

Even more concerning, between 2010 and 2019, the City's Total Estimated Actual Property Value has declined from $2,622,975,971in 2010 to $ $2,415,785,902 in 2019, a decline of 7.9% over the ten-year period[13].

4.2.2 Socioeconomic Indicators

4.2.2.1 Worksheet 5: Unemployment Rate

As shown in Table 9, for 2019, the City's unemployment rate is 6.9%, 1.6% higher than that for the U.S. of 5.3%, placing the City in USEPA's ***"Weak"*** category. Furthermore, as discussed earlier in this Report, the City's unemployment rate has consistently exceeded that for the U.S.

Table 9 USEPA FCA Worksheet 5 (Unemployment Rate)

Worksheet 5 UNEMPLOYMENT RATE		
Line No.		
501	Unemployment Rate - Permittee (1)	6.9%
502	Unemployment Rate - County (use if permittee's rate is unavailable)	7.6%
	Benchmark:	
503	Average National Unemployment Rate: (2)	5.3%

(1) American Community Survey, 2019 5-Year Survey.

(2) American Community Survey, 2019 5-Year Survey.

[13] The Total Estimated Actual Value has decreased every year since 2010 with the exception of 2019.

4.2.2.2 Worksheet 6: Median Household Income (MHI)

Table 10 summarizes the summary of the FCI for MHI per 1997 Guidance. The table reflects income based on the American Community Survey 2019 5-year estimates and indicates that the MHI for the City is 8.1% lower than that for the U.S., placing it in USEPA's ***"Mid-Range"*** category. As discussed earlier in this report, the City's MHI has consistently been below that for the U.S. over the past ten years.

Table 10 USEPA FCA Worksheet 6 (Median Household Income)

Worksheet 6 MEDIAN HOUSEHOLD INCOME			
Line No.			
601	Median Household Income - Permittee [1]	$	57,768
	Benchmark:		
602	Census Year National MHI [2]	$	62,843
603	MHI Adjustment Factor [3]		0.00%
604	Adjusted National MHI (Line 602 x Line 603)	$	62,843

(1) Worksheet 2, Line 203.
(2) American Community Survey, 2018 5-Year Survey.
(3) Worksheet 2, Line 202.

4.2.3 Financial Management Indicators

4.2.3.1 Worksheet 7: Property Tax Revenue as a Percent of Full Market Property Value

Table 11 summarizes Worksheet 7. As shown, the resulting metric for this indicator is 0.42%, which places the City in USEPA's ***"Strong"*** category. However, although USEPA's 1997 Guidance calls for calculation of property tax revenue as a percentage of property value, this fails to account for the fact that ***Ohio municipalities raise the majority of their tax revenue through an income (earnings) tax***. Cleveland Heights's income tax rate of 2.25% is an important indicator of the local burden and is not reflected in an evaluation of property tax burden only. Therefore, ***this metric drastically under-estimates the impact of taxation on households within the City***.

Table 11 USEPA FCA Worksheet 7 (Property Tax as a Percent of Full Market Property Value)

Worksheet 7 PROPERTY TAX AS A PERCENT OF FULL MARKET PROPERTY VALUE		
Line No.		
701	Full Market Value of Real Property (1)	$ 2,415,785,902
702	Property Tax Revenues (2)	$ 10,058,320
703	Property Tax Revenue as a Percent of Full Market Property Value (702 / 701 x 100)	0.42%

(1) Worksheet 4, Line 404.

(2) 2019 Cleveland Heights CAFR.

4.2.3.2 Worksheet 8: Property Tax Collection Rate

As shown in Table 12, the City's property tax collection rate is low, at 76.1%. This places the City in USEPA's ***"Weak"*** category for this indicator.

Table 12 USEPA FCA Worksheet 7 (Property Tax as a Percent of Full Market Property Value)

Worksheet 8 PROPERTY TAX REVENUE COLLECTION RATE		
Line No.		
801	Property Tax Revenue Collected (1)	$ 10,058,320
802	Property Taxes Levied (2)	$ 13,209,653
803	Property Tax Revenue Collection Rate (line 801 / line 802 x 100)	76.1%

(1) 2019 Cleveland Heights City CAFR.

(2) 2019 Cleveland Heights City CAFR.

4.2.4 Worksheet 9: Summary of FCI Scores

As shown in Table 13, the City's Financial Capability Score is 1.83, placing it on the lower end of the range for "Mid-Range."

Table 13 Summary of FCI Score

Line No.	Indicator	Actual Value	Score
	Worksheet 9 — SUMMARY OF PERMITTEE FINANCIAL CAPABILITY INDICATORS		
901	Bond Rating (Line 303)	N/A	3
902	Overall Net Debt as a Percent of Full Market Property Value (Line 405)	8.0%	1
903	Unemployment Rate (Line 501)	6.9%	1
904	Median Household Income (Line 601)	$56,993	2
905	Property Tax Revenues as a Percent of Full Market Property Value (Line 703)	0.42%	3
906	Property Tax Revenue Collection Rate (Line 803)	76.1%	1
907	Permittee Indicators Score (Sum of Column B / Number of Entries)		1.83

4.3 Financial Capability Assessment (FCA) Matrix – Level of Burden

Under the 1997 Guidance, the comparison of the RI calculation in Phase 1 and the FCI score in Phase 2 result in a financial capability matrix that USEPA uses to determine the level of burden imposed on a community in the implementation of mandated Consent Decree projects. As discussed, the two phases of the FCA come together to result in a matrix rating of "Low Burden," "Medium Burden," or "High Burden." Table 14 summarizes the resulting Financial Capability Matrix Score based on 1997 Guidance. As indicated, the FCA indicates the City is at "High Burden."

Table 14 Financial Capability Matrix Score

Line No.		
	Worksheet 10 — FINANCIAL CAPABILITY MATRIX SCORE	
1001	Residential Indicator Score (1)	3.17%
1002	Permittee Financial Capability Score (2)	1.83
1003	Financial Capability Matrix Category	High Burden

(1) Worksheet 2.

(2) Worksheet 9.

In the past, per the original 1997 CSO Guidance, a permittee's rating as "Low Burden," "Medium Burden," or "High Burden" determined the schedule allowed for the completion of LTCP requirements, based upon prescribed timeframes outlined in the Guidance. The 2014 FCA Framework rightfully acknowledged that financial capability is on a continuum, and not discretely described by three alternative conclusions. This is illustrated in Figure 12. Rather than being viewed according to the chart as outlined in the 1997 Guidance, the USEPA is, in effect, characterizing its application of the Financial Capability Matrix as being more along the lines of the chart as shown in Figure 12.

Financial Capability Indicator	Residential Indicator		
	Low Impact (Below 1%)	Mid-Range (1 -2%)	High Impact (Above 2%)
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden
Mid-Range (1.5-2.5)	Low Burden	Medium Burden	High Burden
Weak (Below 1.5)	Medium Burden	High Burden	High Burden

Figure 12 Financial Capability Matrix (Tier 1 Projects Only)

Based on the detailed analysis described throughout this Report, completion of the Master Plan would result in the City being "High Burden." In fact, given that the RI for just the Tier 1 Projects results in an RI of at least 3.17%, or more than one and half times the 2% threshold used by USEPA in indicating "High Impact," it is clear that the ***City is at substantially high impact***. Inclusion of the costs for the entire Master Plan, which could be $565 million or higher, would result in an RI beyond that which any community likely has ever faced. Likewise, the City's FCI is on the lower end of the range for "Mid-Range," and more complete recognition of the community's taxation burden to recognize earned income tax obligations would reduce the City's FCI score even further. Therefore, the City's schedule for the Master Plan must reflect the significant burden the Master Plan will place on the community, allowing sufficient time to complete the plan in a financially responsible manner, in order to mitigate some of the expected severe economic impact on the community.

4.4 Phase 3 –Expanded Financial Capability Assessment Matrix –Proposed 2021 Guidance

In January 2021, USEPA posted the pre-publication "2021 Financial Capability Assessment Guidance" (2021 Guidance). The proposed 2021 Guidance further clarifies the flexibility USEPA provided in the 2014 Financial Capability Assessment Framework memorandum, including options for analysis that will be considered. While recognizing that the 2021 Guidance has not been published in the Federal Register and is not yet adopted guidance, this Report includes the expanded analysis allowed under Alternative 1 of the proposed guidance.

4.4.1 Lowest Quintile Residential Indicator (LQRI)

In USEPA's proposed 2021 Guidance, USEPA has added an additional residential indicator, recognizing the lower end of the income spectrum of the community, recognizing it as a "critical metric" in calculating the impact of the Master Plan on households in the community. As shown in Table 15, the new Lowest Quintile Residential Indicator (LQRI) for Tier 1 Projects only is calculated to be 6.1%, or more than three times the 2% threshold for "High Impact."

Table 15 Lowest Quintile Residential Indicator (Tier 1 Projects Only)

Calculation of Lowest Quintile Residential Indicator (LQRI)			
1	Ratio of Lowest Quintile Houshold Size to Median Household Size		70.2%
2	Annual WWT and CSO Control Cost Per Household (CPH) (Line 109)	$	489
3	NEORSD Est. Cost per Household	$	1,353
4	Total CWA Cost per Household	$	1,842
5	Upper Limit of Lowest Income Quintile for Service Area	$	21,260
6	Cost as Percentage of Low-Income Household [1]		6.1%
7	LQRI Impact Rating	**High Impact**	

[1] *(Line 4*Line 1)/(Line 5)*

4.4.2 Additional FCI Metric – Poverty Indicator (PI)

The proposed 2021 Guidance also includes the addition of a Poverty Indicator (PI) score, which includes five poverty indicators to benchmark the level of poverty in the community. Table 16 summarizes the calculation of the PI. The calculation of the PI Score is based on an average score for each of the five poverty indicators. Each of the poverty indicator scores are evaluated using a ±25% benchmark to national values, similar to the methodology used to calculate the FCI. As shown, the City's PI Score is 1.6, or ***"Mid-Range"*** impact.

Table 16 Poverty Indicator Score

Poverty Indicator Score				
e No.	Census Table			Score
1	S1701	Percentage of Population with Income Below 200% of Federal Poverty Level	36%	
		National Value	31%	
		Percent Difference	*16%*	**2**
2	S1701	Percentage of Population with Income Below Federal Poverty Level	18%	
		National Value	13%	
		Percent Difference	*35.8%*	**1**
3	B19080	Upper limit of Lowest Income Quintile	21,260	
		National Value	25,766	
		Percent Difference	*17%*	**2**
4	B19082	Lowest Quintile Income as a Percentage of Aggregate Income	2.25	
		National Value	3.13	
		Percent Difference	*28%*	**1**
5	S2201	Percentage of Population Receiving Food Stamps/SNAP Benefits	13.90	
		National Value	11.70	
		Percent Difference	*-19%*	**2**
		Sum of Scores		**8**
		Average Score		**1.6**
		Poverty Indicator Benchmarks		**Mid-range Impact**

(1) American Community Survey, 2019 5-Year Survey.

The new Lowest Quintile Burden Index is summarized as Figure 13.

Lowest Quintile Burden Matrix			
Poverty Indicator	Lowest Quintile Residential Indicator		
	Low (Below 1%)	Mid-Range (1 -2%)	High (Above 2%)
Low Impact (Above 2.5)	Low Burden	Low Burden	Medium Burden
Mid-Range (1.5-2.5)	Low Burden	Medium Burden	High Burden
High Impact (Below 1.5)	Medium Burden	High Burden	High Burden

Figure 13 Lowest Quintile Burden Matrix

4.4.3 Expanded Financial Capability Assessment Matrix

The expanded FCA Matrix outlined in the proposed 2021 Guidance incorporates the four recommended critical metrics of RI, FCI, LQRI, and PI to determine the overall level of burden of the Master Plan on the community. The expanded FCA Matrix first combines the RI and FCI to determine an FCA Burden, then by combines the LQRI and PI to determine a Lowest Quintile (LQ) Burden, and finally then combines the FCA Burden and Lowest Quintile Burden for an overall determination of burden. The Expanded FCA Matrix is included below as Figure 15. As shown, the City is at the upper range of ***"High Burden"*** based on the analysis.

FCA Burden (RI and FCI)	LQ Burden (LQRI and PI)		
	Low Burden	Medium Burden	High Burden
Low Burden	Low Burden	Low Burden	Medium Burden
Medium Burden	Low Burden	Medium Burden	High Burden
High Burden	Medium Burden	High Burden	High Burden

Figure 14 Expanded FCA Matrix

5.0 Impact of Schedule on Utility Financial Strength & Customer Bills

The Financial Capability Analysis described in Section 4 is required by the USEPA. While the enhancements proposed in the 2021 Guidance provide improvements by recognizing low income and poverty, the "snapshot" based approach to the FCA still has limitations in understanding the nature and extent of burden placed on customers in completing the Master Plan. In addition, it does not provide any insight into the Sewer Utility's financial capability to complete the Master Plan. As such, as USEPA is proposing in the 2021 Guidance, a detailed long-term financial plan should be developed to understand how the Master Plan may be financed, and the resulting revenue increases that could be required in completing the Master Plan.

The following sections summarize the development of the City's long-range financial plan, reflecting the City's proposed Master Plan schedule for Tier 1 projects.

5.1 Key Assumptions

Following is a summary of the major assumptions incorporated into this analysis.

5.1.1 Customer Growth and Volume/Customer

Over the past several years, the City has experienced a decline in customers. This is due to an average decline in population of approximately 0.5% per year and an average annual decline of 0.3% per year in Occupied Households during 2010-2019. Given the long-term trend in declining population, the long-term financial plan assumes an 0.5% annual decline in residential customers through 2030, remaining constant thereafter. The analysis assumes no change in commercial customers over the study period.

The City has likewise experienced declining volume, due to reductions in customer accounts as well as the general decline in average volume seen throughout the water industry due to conservation, efficiency improvements, etc. In addition, for residential customers, an analysis of average household size over the past 10 years indicates a decline from 2.31 persons per household in 2010 to 2.08 persons per household in 2019, reflecting a total decline of 9.7% over the 10-year period.

In 2020, the restrictions implemented (e.g., stay-at-home orders, closures and/or reduced capacity of commercial establishments) due to the COVID-19 pandemic resulted in a shift in volume between the commercial and residential classes. Residential volume increased 3.0% in 2020 compared to 2019, while commercial volume decreased more than 10%. Because the financial analysis uses 2020 data as the base year for projections, this analysis assumes that a return to pre-pandemic conditions will occur over a two year period (2022-2023), with the following adjustments to volume/customer to result in a return to 2019 levels in 2023:

- Residential: decrease of 1.5%/year in both 2022 and 2023
- Commercial: increase of 5.0%/year in both 2022 and 2023

For the years 2024 through 2030, the analysis assumes a continued decline in average residential volume/customer of 1.0%, remaining unchanged thereafter. The analysis assumes no further change in the average commercial volume/customer.

Table 17 summarizes projected Sewer Utility customers. Table 18 summarizes projected billed volume.

Table 17 Projected Wastewater Customers

Line No.	Description	Projected 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
1	Residential	13,961	13,891	13,822	13,753	13,684	13,615	13,547	13,480	13,412	13,345	13,345	13,345	13,345	13,345	13,345	13,345
2	Commercial	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292
3	Governmental	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
4	Homestead	994	989	984	979	974	969	965	960	955	950	950	950	950	950	950	950
5	Affordability	86	85	85	84	84	84	83	83	82	82	82	82	82	82	82	82
5	Total	15,360	15,285	15,210	15,135	15,061	14,987	14,914	14,841	14,769	14,696	14,696	14,696	14,696	14,696	14,696	14,696

Table 18 Projected Wastewater Volume

Line No.	Description	Projected 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		1000 CF	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*	*1000 CF*
1	Residential	100,500	98,500	96,600	95,100	93,700	92,300	90,900	89,500	88,200	86,900	86,900	86,900	86,900	86,900	86,900	86,900
2	Commercial	20,000	21,000	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100	22,100
3	Governmental	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
4	Homestead	5,400	5,300	5,200	5,100	5,100	5,000	4,900	4,800	4,800	4,700	4,700	4,700	4,700	4,700	4,700	4,700
5	Affordability	800	800	800	800	800	700	700	700	700	700	700	700	700	700	700	700
6	Total	127,300	126,200	125,300	123,700	122,300	120,700	119,200	117,700	116,400	115,000	115,000	115,000	115,000	115,000	115,000	115,000

5.1.2 Cost Escalation

Capital costs are projected to increase at 3.0% per year throughout the study period, based on the 25-year average for the Engineering News Record (ENR) Construction Cost Index (CCI) for the Cleveland region.

Operation & Maintenance expenses are projected to increase over time based on the 25-year average Consumer Price Index (CPI) for All Urban Consumers, Midwest region. Specific indices used are as follows:

- CPI “All Items” = 1.94% (used for salaries/wages, contractual services, equipment rental, materials & supplies and ‘all other’)
- CPI “Fuels & Utilities” = 2.58% (used for power, chemicals and fuel)
- CPI “Medical Care” = 3.54% (used for employee benefits)

5.1.3 Growth in Income

In calculating the projected impact of annual revenue increases on residential customers over the study period, income has been assumed to increase at a rate of 1.94%, or equal to CPI/All Items. Based on an analysis of MHI for the period 2010-2019, MHI growth has varied substantially on a year-to-year basis, with a cumulative increase of 18.6% over the time period. This equates to 1.9% average annual growth. As the calculated historical average growth is approximately equal to CPI, for simplicity, CPI was used to calculate residential bill impact.

5.1.4 Funding of Capital Program

The capital improvement program is projected to be financed with a mix of debt and cash financing. Specific assumptions follow.

5.1.4.1 Future Low Interest Loans

A portion of the Utility’s total capital improvement is assumed to be funded with low interest Clean Water State Revolving Fund (CWSRF) loans from the Ohio Water Development Authority (OWDA). Loans have been assumed to fund the Utility’s Asset Management programmatic spending, beginning 2023. These loans have been modeled to assume begin repayment based on 30 year equal annual principal and interest payments beginning two years after the year costs are projected to be incurred, reflecting an assumed completion date and closing of the loan, 2.5% interest rate, and 0.5% issuance expense.

5.1.4.2 Future G.O. Bonds

Based on input from the City’s Finance Director and the City’s Financial Advisor, no G.O. bond issuances are assumed at any point during the study period.

5.1.4.3 Future Revenue Bonds

Due to the magnitude of the Master Plan, it is anticipated that the City will not be able to continue to fund the program through G.O. bonds. Therefore, it will be necessary to issue revenue bonds over the 15-year projection period. This analysis assumes the City will need to issue revenue bonds beginning in

2022 and throughout the remainder of the study period. Revenue bond issuances have been determined based on necessary minimum fund balance requirements, balanced with other sources of funding, including OWDA loans and cash. Repayment of bonds is assumed based on a 30-year term, equal annual principal and interest payments at 4.0% in 2022 and 4.5% for years 2023 and beyond. Issuance costs are assumed to be 1.0% of the par amount of bonds.

5.1.4.4 Other Sources of Capital Funding

As discussed below, the City receives a portion of the revenue NEORSD receives from stormwater fees collected within the City. This funding is planned for use annually as a source of cash financed funding of the capital program.

No other sources of funding for the capital program have been included in this analysis. While the City plans to continue to pursue outside funding, including NEORSD's Member Community Infrastructure Program (MCIP), due to the uncertainty of attaining outside funding, the City must evaluate the affordability of the Master Plan based on funding sources that are expected to be available during the study period.

5.2 Projected Revenue

5.2.1 Revenue from User Charges

Revenue under existing rates is calculated based on the projected number of customers and volume and existing rates in place for 2021. Projected revenue increases are based on the annual revenue increases required to fully fund all operating costs, fund the capital program and provide necessary fund balances and other metrics required to maintain the utility in a sound financial condition, reflecting key financial metrics discussed below, while minimizing volatility in annual revenue increases to the extent possible.

5.2.2 Non-Rate Revenue

Projected revenue is adjusted to reflect bad debt. Bad debt is currently calculated to be approximately 18.5% of billed sewer charge revenue based on an analysis of 2020 current year billed and collected revenues. The County's collection effort for past due debt is calculated separately, as discussed below.

In addition to revenue from rates, the Utility has a modest amount of miscellaneous revenue, including certain fees and charges. Such revenue is projected to remain at current levels throughout the study period. In addition, the Utility receives revenue from the County. This revenue reflects past due billings recovered by the County through a City/County agreement. Under the agreement, once accounts are 60 days past due, the City is authorized to send outstanding balances to the County Auditor's Office to be placed on property taxes and collected for payment. These payment collections have been projected to grow at the same rate as the increase in Sewer Utility volume charge revenue.

Finally, the Utility also receives from NEORSD cost share revenue, under an agreement with NEORSD whereby the City receives 25% of revenue from stormwater charges collected from the City's customers. While the City has discretion as to when to utilize this funding, for the purposes of the long-range financial plan, the annual revenue is projected to be used in the year received. District cost share revenue is projected to increase in line with the projected increase in NEORSD rates[14].

5.3 Projected O&M

Operation and Maintenance expenses (O&M) are being projected based on the 2021 Utility budget, which is then projected each year of the study period based on the escalation factors previously discussed. While the escalation factors presented herein are base do historical averages, the current economic climate and concern regarding increased inflation are a concern. The U.S. Bureau of Labor Statistics recently reported that CPI I April 2021 increased 0.8%, with a year over year increase of 4.2%. on May 12, 2021, Bloomberg[15] reported that "U.S. Consumer Prices Jump Most Since 2009, Outpacing Estimates." While the impact of the pandemic certainly impacted 2020 data, Bloomberg highlights concerns regarding core inflation. If inflation in the coming years outpaces the historical average, the resulting increase in O&M costs will drive up rates beyond those projected in this Report.

Projected O&M costs are summarized in Table 19.

[14] NEORSD rate increases reflect those discussed during the May 6, 2021 NEORSD Board of Trustee meeting.

[15] US Inflation: Consumer Prices in U.S. Increase by Most Since 2009 - Bloomberg

Table 19 Projected Wastewater Operation & Maintenance Expenses

Line No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1	Salaries	973,092	991,991	1,011,258	1,030,898	1,050,920	1,071,331	1,092,139	1,113,350	1,134,974	1,157,017	1,179,489	1,202,397	1,225,750	1,249,556	1,273,825	1,298,565
2	Benefits	491,307	508,677	526,661	545,281	564,560	584,520	605,186	626,582	648,735	671,671	695,418	720,004	745,460	771,816	799,104	827,356
3	Contractual Services	299,028	713,852	727,716	741,850	756,258	770,946	785,920	801,184	816,744	832,607	848,778	865,263	882,068	899,200	916,664	934,467
4	Materials, Supplies, and Servic	601,098	612,779	624,687	636,827	649,202	661,818	674,679	687,790	701,156	714,782	728,672	742,833	757,269	771,985	786,988	802,282
5	Contractual Services - Other	25,000	25,486	25,981	26,485	27,000	27,524	28,058	28,603	29,159	29,725	30,303	30,891	31,491	32,103	32,726	33,362
6	Total O&M Expense	2,389,525	2,852,785	2,916,303	2,981,342	3,047,940	3,116,140	3,185,982	3,257,510	3,330,768	3,405,802	3,482,660	3,561,388	3,642,038	3,724,660	3,809,306	3,896,032

5.4 Projected Capital Spending

Figure 15 summarizes the capital expenditures planned over the study period. Capital expenditures reflect not only the Master Plan costs, but also other capital expenditures required to help maintain the system in sound condition. This includes additional capital costs associated with the anticipated CMOM program, on-going asset management, and equipment.

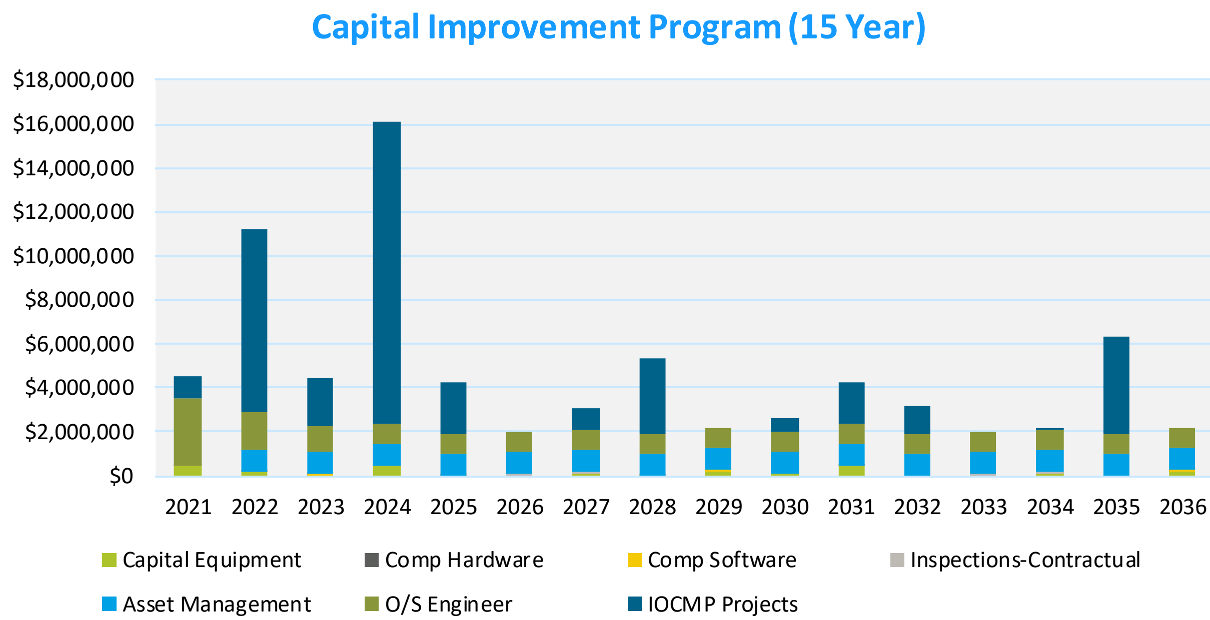

Figure 15 Capital Improvement Program

Table 20 provides a summary of annual capital spending in current (2020$) and escalated dollars. While capital costs are escalated in this analysis, as discussed previously regarding the potential impact of higher inflation, increased costs will impact the capital program costs and resulting financing needs. In addition to inflation, however, the City could face local cost increases due to limited contractor capacity that could further drive up capital costs.

5.5 Capital Financing Plan

Table 21 provides a summary of the projected capital financing plan.

Table 20 Projected Sewer Utility Capital Program

Line No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
	Sewer Capital Projects																
1	Consent Decree	1,000,000	8,305,000	2,159,000	13,708,000	2,379,000	-	1,001,000	3,454,000	-	654,000	1,851,000	1,259,000	-	50,000	4,446,000	-
2	Asset Management	-	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
3	Other	3,563,500	1,879,800	1,259,800	1,359,800	919,800	951,800	1,044,800	919,800	1,139,800	1,009,800	1,359,800	919,800	951,800	1,044,800	919,800	1,139,800
4	Total	4,563,500	11,184,800	4,418,800	16,067,800	4,298,800	1,951,800	3,045,800	5,373,800	2,139,800	2,663,800	4,210,800	3,178,800	1,951,800	2,094,800	6,365,800	2,139,800
	Sewer Capital Projects Inflated																
5	Consent Decree	1,000,000	8,811,500	2,359,500	15,431,000	2,758,500	-	1,231,500	4,376,900	-	879,300	2,563,400	1,795,900	-	75,700	6,931,000	-
6	Asset Management	-	1,061,000	1,092,900	1,125,700	1,159,500	1,194,300	1,230,200	1,267,200	1,305,300	1,344,500	1,384,900	1,426,500	1,469,300	1,513,500	1,558,900	1,605,800
7	Other	3,670,600	1,994,400	1,376,800	1,530,700	1,066,500	1,136,800	1,285,300	1,165,600	1,487,700	1,357,600	1,883,100	1,312,100	1,398,500	1,581,300	1,433,900	1,830,200
8	Total	4,670,600	11,866,900	4,829,200	18,087,400	4,984,500	2,331,100	3,747,000	6,809,700	2,793,000	3,581,400	5,831,400	4,534,500	2,867,800	3,170,500	9,923,800	3,436,000

Table 21 Projected Capital Financing Plan

Line No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
	Sources of Funds																
1	Funds Available at Beginning of Yea	1,486,100	1,595,170	11,170	11,370	16,470	11,970	16,370	16,670	19,070	11,070	19,970	456,070	11,470	12,170	13,970	21,470
2	Revenue Bond Proceeds	-	7,050,000	1,270,000	15,100,000	2,000,000	-	-	3,000,000	-	-	2,600,000	-	-	-	3,800,000	-
3	GO Bond Proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	CWSRF Proceeds	-	-	1,061,000	1,093,000	1,126,000	1,160,000	1,194,000	1,230,000	1,267,000	1,305,000	1,344,000	1,385,000	1,426,000	1,469,000	1,513,000	1,559,000
5	Cash Financing of Capital Projects	4,069,370	3,400,000	2,270,000	1,950,000	1,650,000	810,000	2,170,000	2,400,000	1,100,000	1,850,000	2,060,000	2,230,000	950,000	1,190,000	4,360,000	1,320,000
6	NEORSD CCS Fund Balance	400,000	-	-	695,000	-	-	-	-	-	-	-	-	-	-	-	-
7	Annual NEORSD CCS Funds	298,400	311,100	324,400	338,000	352,400	367,200	385,100	402,500	419,900	437,300	455,800	474,900	494,900	515,700	537,200	559,800
8	Interest Income	11,900	-	-	-	-	4,100	4,200	-	4,400	4,500	-	6,900	4,700	4,900	-	5,200
9	Total Funds Available	6,265,770	12,356,270	4,936,570	19,187,370	5,144,870	2,353,270	3,769,670	7,049,170	2,810,370	3,607,870	6,479,770	4,552,870	2,887,070	3,191,770	10,224,170	3,465,470
	Application of Funds																
10	Major Capital Improvements	4,670,600	11,866,900	4,829,200	18,087,400	4,984,500	2,331,100	3,747,000	6,809,700	2,793,000	3,581,400	5,831,400	4,534,500	2,867,800	3,170,500	9,923,800	3,436,000
11	Issuance Costs	-	70,500	18,000	156,500	25,600	5,800	6,000	36,200	6,300	6,500	32,700	6,900	7,100	7,300	45,600	7,800
12	Bond Reserve Funds	-	407,700	78,000	927,000	122,800	-	-	184,200	-	-	159,600	-	-	-	233,300	-
13	Total Application of Funds	4,670,600	12,345,100	4,925,200	19,170,900	5,132,900	2,336,900	3,753,000	7,030,100	2,799,300	3,587,900	6,023,700	4,541,400	2,874,900	3,177,800	10,202,700	3,443,800
14	End of Year Balance	1,595,170	11,170	11,370	16,470	11,970	16,370	16,670	19,070	11,070	19,970	456,070	11,470	12,170	13,970	21,470	21,670

5.6 Financial Metrics

Due to the magnitude of the Utility capital program, the City does not believe it will be possible to issue G.O. debt in the future. Therefore, it will be necessary to fund a portion of the program through revenue bonds. This will require the City to maintain the Utility's financial condition in a manner expected by rating agencies to achieve at least a "AA" rating in order to minimize interest costs. This includes achieving key criteria, or financial metrics, that rating agencies evaluate in assigning ratings to bond issuances. Key financial metrics[16] calculated and planned for in this financial model include:

- Minimum Debt Service Coverage: 180%
- Minimum fund balance of 240 days O&M

It should be noted that other key criteria, including overall debt ratio, debt per capita, debt per customer, amortization of debt over life over projection period, etc. should be evaluated as the Master Plan is further refined. This is particularly important as the City faces a substantial capital program and will be required to issue bonds most years of the study period.

5.7 Results

The results of the analysis indicate that annual revenue increases will be required over the study period, with substantial increases required in the early years of the Master Plan. Figure 16 provides a comparison of projected revenues and revenue requirements.

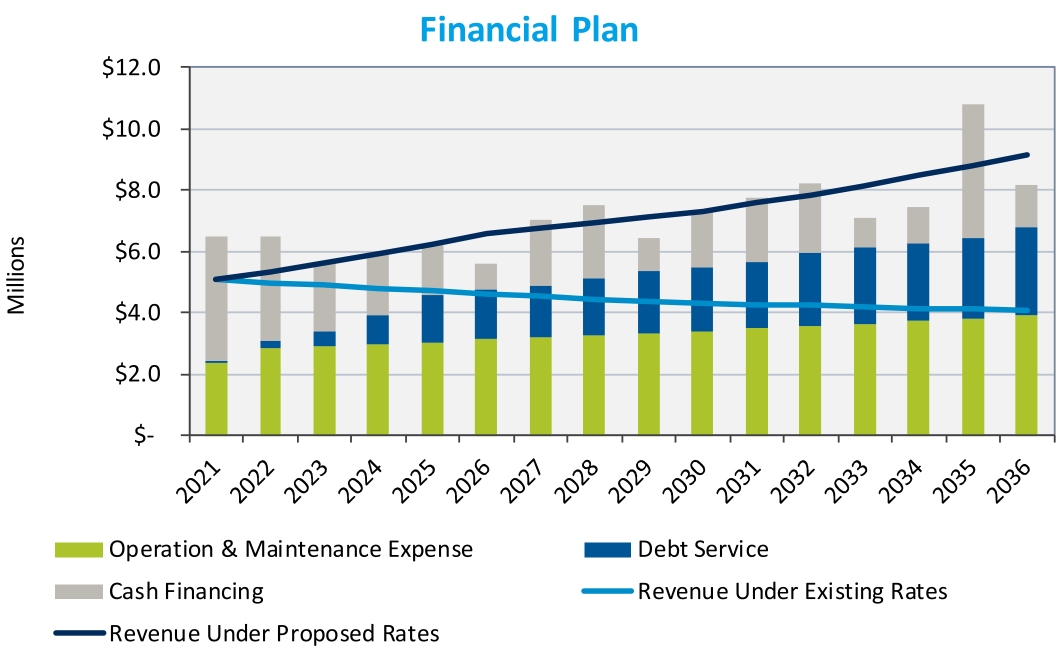

Figure 16 Projected Financial Plan

Table 22 provides further detail the Utility's projected cashflow over the study period.

[16] Per City's Financial Advisor.

Table 22 Projected Cashflow

Line No.	Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1	Revenue Under Existing Rates	5,712,500	5,663,800	5,624,500	5,552,900	5,488,700	5,419,100	5,352,100	5,285,200	5,225,600	5,163,200	5,163,200	5,163,200	5,163,200	5,163,200	5,163,200	5,163,200
	Increased Revenue (a)	-	362,500	743,000	1,135,800	1,545,900	1,970,700	2,223,700	2,480,200	2,743,900	3,010,400	3,321,000	3,643,400	3,978,100	4,325,500	4,686,100	5,060,400
2	Total Revenue from Rates	5,712,500	6,026,300	6,367,500	6,688,700	7,034,600	7,389,800	7,575,800	7,765,400	7,969,500	8,173,600	8,484,200	8,806,600	9,141,300	9,488,700	9,849,300	10,223,600
3	Bad Debt	(1,055,400)	(1,113,300)	(1,176,400)	(1,235,700)	(1,299,600)	(1,365,300)	(1,399,600)	(1,434,600)	(1,472,400)	(1,510,100)	(1,567,400)	(1,627,000)	(1,688,800)	(1,753,000)	(1,819,600)	(1,888,800)
4	Other Revenue	386,600	410,500	436,000	463,100	491,900	522,600	542,000	562,100	583,000	604,700	627,200	650,600	674,800	700,000	726,100	753,200
5	Interest Income - Operations	42,700	30,400	25,200	25,900	26,600	32,200	35,900	31,700	32,400	36,000	35,500	33,400	37,600	48,500	44,000	39,400
6	Total Revenue	5,086,400	5,353,900	5,652,300	5,942,000	6,253,500	6,579,300	6,754,100	6,924,600	7,112,500	7,304,200	7,579,500	7,863,600	8,164,900	8,484,200	8,799,800	9,127,400
7	Operation & Maintenance Expense	2,389,500	2,852,800	2,916,300	2,981,300	3,047,900	3,116,100	3,186,000	3,257,500	3,330,800	3,405,800	3,482,700	3,561,400	3,642,000	3,724,700	3,809,300	3,896,000
	Debt Service Requirements																
8	Existing Revenue Bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Proposed Revenue Bonds	-	203,900	446,700	949,200	1,474,100	1,535,500	1,535,500	1,627,600	1,719,700	1,719,700	1,719,700	1,879,300	1,879,300	1,879,300	1,879,300	2,112,600
10	Total Revenue Bond Debt Service	-	203,900	446,700	949,200	1,474,100	1,535,500	1,535,500	1,627,600	1,719,700	1,719,700	1,719,700	1,879,300	1,879,300	1,879,300	1,879,300	2,112,600
11	Existing GO Bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Proposed GO Bonds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Total GO Bond Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Existing CWSRF Loans	38,200	19,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Proposed CWSRF Loans	-	-	-	-	52,000	105,500	160,600	217,400	275,900	336,100	462,000	527,800	595,600	665,400	737,300	811,400
16	Total CWSRF Loans	38,200	19,100	-	-	52,000	105,500	160,600	217,400	275,900	336,100	462,000	527,800	595,600	665,400	737,300	811,400
17	Total Debt Service	38,200	223,000	446,700	949,200	1,526,100	1,641,000	1,696,100	1,845,000	1,995,600	2,055,800	2,181,700	2,407,100	2,474,900	2,544,700	2,616,600	2,924,000
18	Transfer from (to) General Fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Cash Financing of Capital Projects	4,069,370	3,400,000	2,270,000	1,950,000	1,650,000	810,000	2,170,000	2,400,000	1,100,000	1,850,000	2,060,000	2,230,000	950,000	1,190,000	4,360,000	1,320,000
20	Canceled prior year encumbrances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Total Expenses	6,497,070	6,475,800	5,633,000	5,880,500	6,224,000	5,567,100	7,052,100	7,502,500	6,426,400	7,311,600	7,724,400	8,198,500	7,066,900	7,459,400	10,785,900	8,140,000
22	Net Balance	(1,410,670)	(1,121,900)	19,300	61,500	29,500	1,012,200	(298,000)	(577,900)	686,100	(7,400)	(144,900)	(334,900)	1,098,000	1,024,800	(1,986,100)	987,400
23	Beginning Fund Balance	4,450,688	3,040,018	1,918,118	1,937,418	1,998,918	2,028,418	3,040,618	2,742,618	2,164,718	2,850,818	2,843,418	2,698,518	2,363,618	3,461,618	4,486,418	2,500,318
24	End of Year Balance	3,040,018	1,918,118	1,937,418	1,998,918	2,028,418	3,040,618	2,742,618	2,164,718	2,850,818	2,843,418	2,698,518	2,363,618	3,461,618	4,486,418	2,500,318	3,487,718
	Operating Reserve Fund																
25	Number of Days - Actual	464	245	242	245	243	356	314	243	312	305	283	242	347	440	240	327
26	*Number of Days - Target*	*120*	*120*	*120*	*120*	*120*	*120*	*120*	*120*	*120*	*120*	120	120	120	120	120	120
	Debt Service Coverage (Net Revenue/Debt Service)																
27	GO/Revenue Debt Service Coverage	-	1227%	612%	312%	217%	226%	232%	225%	220%	227%	238%	229%	241%	253%	266%	248%
28	Total Debt Service Coverage	7060%	1122%	612%	312%	210%	211%	210%	199%	190%	190%	188%	179%	183%	187%	191%	179%
29	*Total Debt Service Coverage - Target*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*	*150%*
30	Debt as % of Total Expenses	1%	3%	8%	16%	25%	29%	24%	25%	31%	28%	28%	29%	35%	34%	24%	36%
31	Annual Revenue Increase	0.0%	6.4%	6.4%	6.4%	6.4%	6.4%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
32	Cumulative Revenue Increase	0.0%	6.4%	13.2%	20.5%	28.2%	36.4%	41.5%	46.9%	52.5%	58.3%	64.3%	70.6%	77.0%	83.8%	90.8%	98.0%
	Annual Bill as % of Income (WW/SW)																
33	Median Household Income	1.90%	1.95%	1.90%	1.96%	2.01%	2.07%	2.12%	2.17%	2.10%	2.14%	2.18%	2.23%	2.28%	2.33%	2.37%	2.42%
34	Lowest Quintile Income - Homestead	2.43%	2.33%	2.39%	2.46%	2.53%	2.60%	2.67%	2.73%	2.79%	2.64%	2.70%	2.76%	2.81%	2.87%	2.93%	3.00%
35	Lowest Quintile Income - Affordability	3.90%	4.01%	4.29%	4.41%	4.54%	4.11%	4.21%	4.31%	4.40%	4.49%	4.59%	4.69%	4.78%	4.88%	4.99%	5.09%

As shown in Figure 17, while the Utility currently has very little outstanding debt, new debt issuances (both low interest loans and revenue bonds) are projected to increase rapidly, resulting in the Sewer Utility reaching more than 35% of the total budget by 2033.

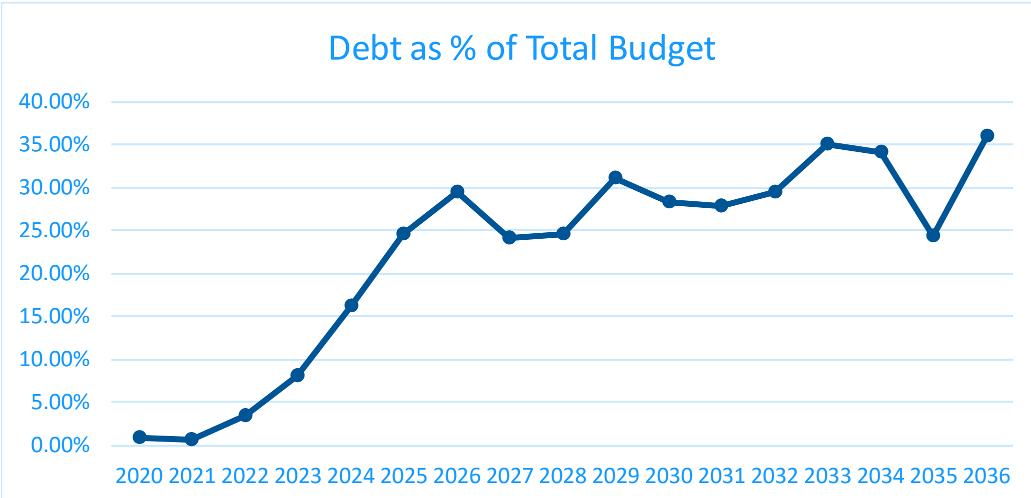

Figure 17 Projected Debt as a Percent of Total Budget

5.7.1 Required Revenue Increases

Annual and cumulative revenue increases are shown on Table 20, Lines 31 and 32. The following graphs present a comparison of annual and cumulative revenue increases required each year of the study period. In order to fund the Master Plan Tier 1 Projects by the end of 2036, the City is projected to be required to implement a series of revenue increases that exceed the 25-year average annual Consumer Price Index (CPI), as indicated in Figure 18.

As shown in Figure 19, the cumulative impact on rates over the study period is immense, with the cumulative total increase in rates reaching 98% by 2036.

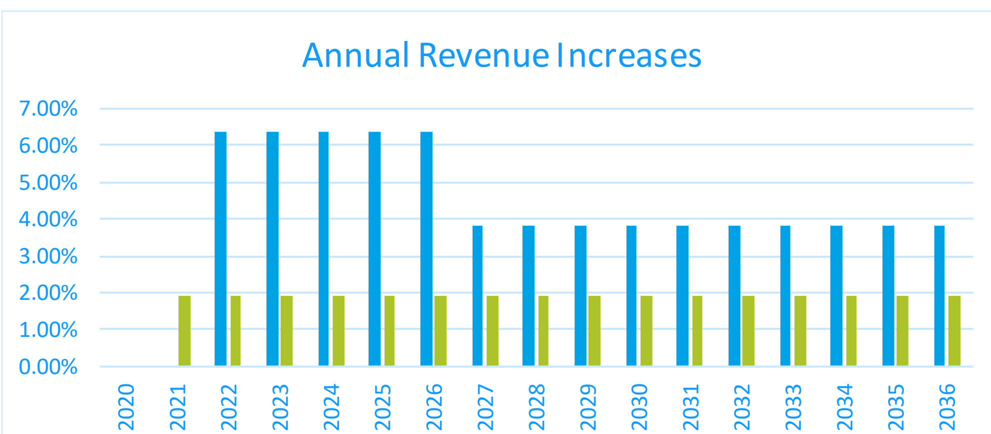

Figure 18 Projected Annual Wastewater Rate Increases Compared to 25-Year Avg CPI (All Items-Midwest)

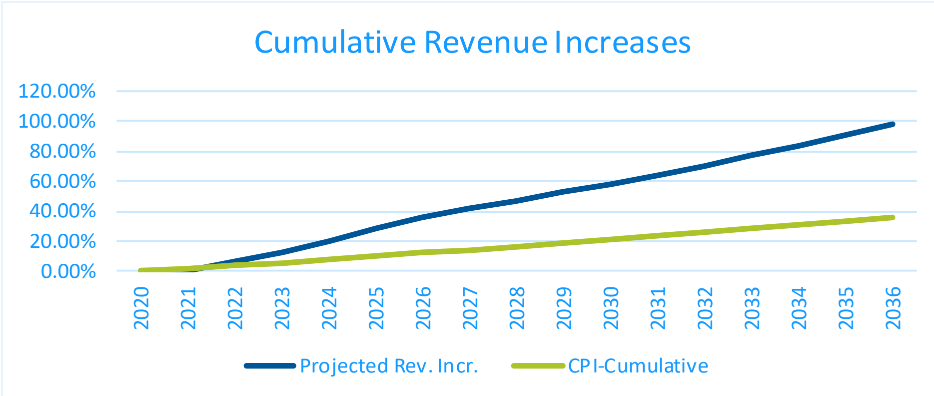

Figure 19 Projected Cumulative Wastewater Rate Increases Compared to 25-Year Avg CPI (All Items-Midwest)

5.8 Calculated "Burden" on Customers – Clean Water Act Costs

As discussed above, in order to fund the potential Master Plan analyzed in this study and continue to fund on-going operation, maintenance and system renewal needs, the City is expected to be required to increase sewer rates each year through 2036. The annual cost for the average residential customer with 1.8 MCF/quarter of volume is projected to increase from $312.84 in 2021 to $550.62 in 2036. However, this does not reflect the City's customers' total cost for CWA compliance. While the total annual costs to residential customers appears low, the City is responsible only for local sewer operation and maintenance. NEORSD is responsible for conveyance and treatment. NEORSD is also under a consent decree and has experienced significant annual rate increases to fund their consent decree program. They are currently discussing their next five-year rate schedule, which includes annual rate increases of 4.2% for the next five years, or more than twice the rate of inflation. They have also indicated continued annual rate increases at least through the end of their program in 2036. Based on information NEORSD has released in public discussions, the ***annual cost for a residential customer is projected to increase from $828.36 to $1,389.60, resulting in a combined annual bill of $1,141.20 in 2021 increasing to $1,942.22 in 2036***.

The average residential bill is currently calculated to be equal to 1.9% of MHI, just below the USEPA threshold for "high impact" of 2% of MHI. By 2036, the average bill as a percent of MHI is projected to increase to 2.42%. This takes into consideration the change over time in average volume, in line with the assumptions used for volume/customer for the development of the financial plan.

Furthermore, as expected, customers included in the Homestead and Affordability program currently experience much higher impact, with the impact to worsen over the study period, even recognizing a 40% reduction in rates for customers in the program (for City and NEORSD). An analysis of 2019 billing data indicates that the average quarterly volume for Homestead customers is 1.4 MCF/quarter. For customers in the Affordability program, the average volume is actually much higher than that for residential customers paying the regular rate, at 2.4 MCF/quarter. To evaluate the impact of the Program on customers in the City's assistance programs, Lowest Quintile Income (LQI) is used. For Homestead customers, the impact increases from 2.43% in 2021 to 3.0% in 2036, and for Affordability customers, the impact is even higher, increasing from 3.9% in 2021 to 5.09% in 2036. Figure 20 illustrates the increase in customer burden over the study period, compared to the USEPA threshold for "high burden" of 2%.

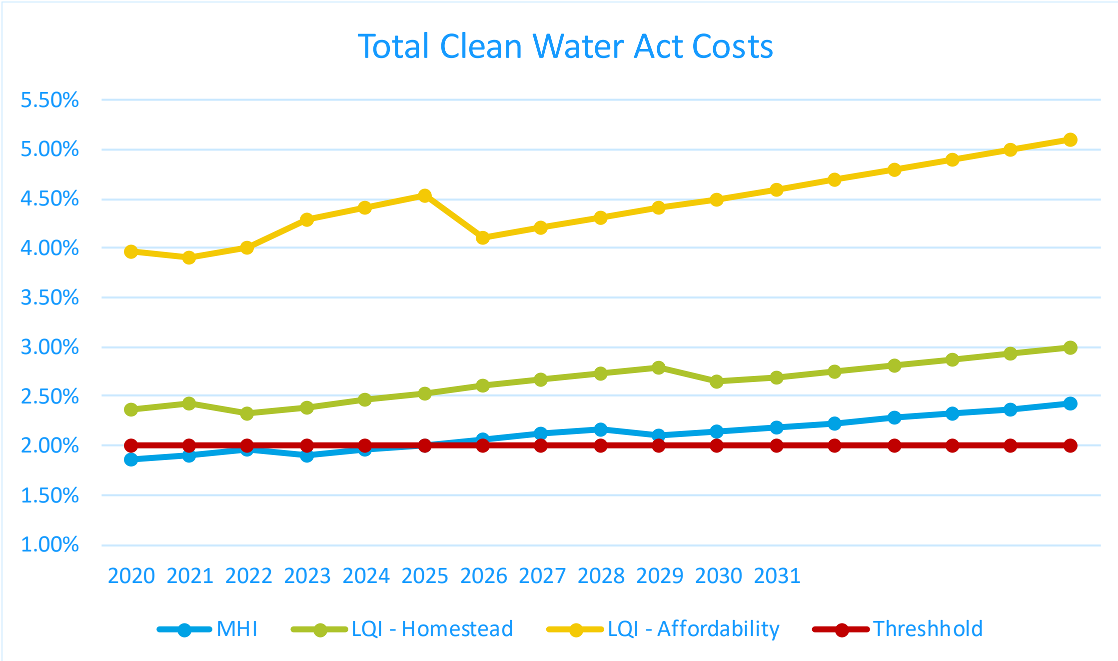

Figure 20 Projected Annual Residential Bills as a Percent of Income

6.0 Conclusions

As demonstrated throughout this report, due to the City's current and anticipated economic condition and the high cost of the Master Plan, along with the burden customers already are experiencing due to the obligations NEORSD has in completing its consent decree requirements, it is clear that the Program presented in this Report stretches the limits of the City's financial capability. Any program that requires increased funding, or a shorter schedule, would result in an unacceptable burden on customers, and would push the Sewer Utility beyond its financial capability to remain financially sound.

While not presented in this Report, based on preliminary evaluation of the first several years after the completion of the Master Plan Tier 1 projects, the City will need to continue to increase rates to maintain the minimum financial metrics recommended by the City's Financial Advisor and expected by rating agencies. This is without any additional consent decree funding.

In addition, the current economic climate includes concerns about increasing inflation due to pent up demand coming out of the restrictions of the pandemic and federal stimulus funding. While the analysis summarized in this Report includes assumptions for both O&M and capital inflation, increases beyond that assumed over the study period will require further revenue increases, thus increasing the burden on customers.

Given the uncertainty of future conditions, the City will continue to monitor financial conditions to determine what, if any, additional spending may be possible in 2037 and beyond.