Independent Cost Analysis of the City of Bristol Solid Waste Disposal and Collection Divisions

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EXECUTIVE SUMMARY

E.1 INTRODUCTION

This Executive Summary presents an overview of the results of the Independent Cost Analysis of Solid Waste Disposal and Collection Divisions (Analysis) that was conducted for the City of Bristol, Virginia (City), by SCS Engineers (SCS).

The City's Solid Waste System (Utility) provides curbside collection for its residents and also operates an Integrated Solid Waste Management Facility (ISWMF). The City currently has contracts with various entities and municipalities that bring their solid waste to the City's Permit No. 588 Quarry fill (Landfill). These contracts have not been updated and the rates have not been adjusted for inflation in recent years. Although it is intended to be managed independently of other City finances, the Solid Waste Enterprise Fund has been receiving annual transfers in from the General Fund and has been relying on General Obligation debt to finance its landfill capital expenditures.

Because of this, the Utility has considerable annual debt service obligations and is dependent upon the General Fund for annual transfers. However, the General Fund is increasingly burdened by the Utility's need for transfers and the City is considering alternatives to make the Utility financially sustainable and eventually eliminate its dependence upon the General Fund. As a result, in July 2018 the City retained SCS to conduct an Analysis of the Public Works Department's Solid Waste Collection and Disposal Divisions. The results of the Analysis are presented in this Report and summarized in this Executive Summary.

Objectives

The principal objectives of the Analysis are as follows:

Conduct an Operational Review and Data Analysis – Obtain key facility and program information by performing a site visit, conducting interviews with key personnel, and reviewing background financial and operational documents to independently assess current Collections and Disposal Division activities. Use data, operational information, and site visit results to assist with benchmarking, conducting a competitive analysis, and enhancing financial modeling efforts, including the Revenue Sufficiency Analysis and alternative scenarios. Make recommendations to potentially reduce expenditures as compared to the baseline and explore other alternative scenarios.

Perform a Revenue Sufficiency Analysis (RSA) – Develop a multi-year forecasting model for the Utility's Solid Waste Disposal and Collection Divisions that will determine the level of annual revenue required to satisfy its projected annual operating, debt service, and capital cost requirements.

Examine Potential Alternative Scenarios – The Analysis examines four possible scenarios that the City wishes to consider, as described below. For each scenario considered, the associated level of rate adjustments and/or costs to the Utility are identified and presented in this Report.

- *Increase Rates* – Examine the impact to the Utility's curbside collections customer rates and/or tipping fees to recover the costs associated with providing services to the City's customers.
- *Reduce Expenses* – Analyze the Utility's current programs and related expenses and capital costs and make suggestions as to potential expense reductions.

- *Landfill Closure* – Consider whether the City can obtain permits to close the Landfill and, if so, estimate the associated costs.
- *Landfill Sale or Privatization* – Review any available information on recent landfill sales in the area and estimate the price the City could expect to receive if it sold its landfill to an interested agency.

The results of the RSA and each identified alternative scenario are summarized in this Executive Summary.

E.2 REVENUE SUFFICIENCY ANALYSIS

The Revenue Sufficiency Analysis (RSA) evaluated the sufficiency of the Utility's solid waste revenues to meet all of its current and projected financial requirements over a ten-year projection period. It also assessed the level of rate revenue increases necessary in each year of the projection period to provide sufficient revenues to fund all of the Utility's cost requirements. In interactive meetings with City staff, we thoroughly discussed the source data and assumptions used in the analysis, and applied the revenue sufficiency calculations to potential alternative scenarios for the Utility. Throughout this process, we identified the financial management plan and associated plan of annual solid waste rate revenue increases that would be necessary to address the current and projected cost requirements of the Utility for each scenario considered. **Appendices A and B** include detailed schedules presenting all of the data and assumptions utilized in the RSA.

E.3 ALTERNATIVE SCENARIO ANALYSIS

Increase Rates

In completing the RSA, the Analysis found that the Utility's ongoing financial sustainability was not viable without significant revenue adjustments. In spite of annual transfers into the Solid Waste Enterprise Fund and the issuance of multiple municipal bonds to fund capital projects, the Utility continues to lose money for each ton of material managed at the ISWMF, in large part due to debt service obligations on the debt.

One of the intents of this Analysis is to assume the revenue requirement for the City's ongoing financial sustainability is not just the burden of the Utility's Collections customers. Therefore, adjustments to the tipping fees paid by the Utility's commercial disposal customers at the ISWMF were modeled in conjunction with those paid by Collections customers in their Utility bill.

Key Findings

Based upon the data, assumptions, and analysis performed, the Utility's current rates (waste collection fees and solid waste disposal fees) will not provide sufficient revenue to meet its ongoing debt service, capital, and operating cost requirements over a multi-year projection period. Further, the Utility requires significant increases in revenues in FY 2020 and FY 2021 to remain financially sustainable throughout the projection period. Thereafter, the Utility will need to implement inflationary-like rate adjustments to ensure ongoing financial sustainability throughout the projection period and to prevent the future need for large rate adjustments.

The 5-year plan of recommended rate adjustments along with the average residential bill is shown in the table below. Detailed schedules reflecting all of the data and assumptions used in this analysis is available in a later section of this Report and in **Appendix A**.

Rate Revenue Adjustments

	Current	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Rate Adjustment	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%
Average Residential Bill	$22.00	$41.80	$69.39	$71.47	$73.61	$75.82

Reduce Expenses

While it will not entirely eliminate the need for rate adjustments, reduction of expenses could reduce the level of required rate increases. As part of an additional alternative scenario, SCS evaluated the financial impact of decreasing certain solid waste program and facility expenses by reducing service offerings or frequencies as well as implementing potential operational efficiencies that could be realized in the Collection and Disposal Divisions.

Review of background information, discussions with Solid Waste personnel, and a site reconnaissance of the ISWMF indicated that significant operational changes to reduce expenses have already been put into place in both the disposal and collections portions of the solid waste program, leaving few opportunities to further reduce expenditures in a meaningful way. In fact, it appears that the means in which expenses have already been reduced, possibly including deferred maintenance of capital infrastructure and equipment is not sustainable.

Key Findings

Not a financially sustainable alternative

Landfill Closure

Next, the Analysis evaluated the financial impact on the Utility if the City were to close the active Quarry Landfill Cell (prior to achieving full design capacity) and introduce alternative options for handling solid waste generated within the City.

If the City were to close the Landfill, the Utility would incur the costs of closure and post closure care as well as increased disposal costs to haul (either directly or via transfer) and dispose of the City's solid waste at another disposal facility. It appears that costs may be required to repair and enhance the City's transfer station/baler building (which recently has been used for recyclable material consolidation) for managing MSW as well. Further, if the City does not transfer the ownership of the ISWMF and instead enters into an agreement with an operator who will run the facility, the City would likely still face future liability for the closure and post-closure costs of both the Permit No. 498 and the Permit No. 588 landfills.

Key Findings

Not a financially sustainable alternative

Enterprise Sale or Privatization

The City is also considering options to sell certain solid waste facility assets (most notably the active Quarry Landfill Cell and associated infrastructure/auxiliary facilities) or enter into a public-private partnership where certain programs and/or facilities such as Landfill operations would be operated by a third-party private contractor while continuing to serve in conjunction with the City to meet its solid waste management needs. Although privatization might yield modest net revenue for the City under the right outsourcing agreement, it seems unlikely to significantly increase the Landfill's

annual revenues or profitability. The enterprise sale alternative consisted of three potential options because it was assessed by examining the Disposal and Collections Divisions sold independently and together, with varying results. Modeling of the sale of the Disposal Division (Landfill) was performed

Key Findings

Based upon the data, assumptions, and analysis performed, even if the City sells the ISWMF, the Utility's current waste collection rates will not provide sufficient revenue to meet its ongoing debt service, capital, and operating cost requirements over a multi-year projection period. Further, the Utility requires significant increases in revenues in FY 2020 and FY 2021 to remain financially sustainable throughout the projection period. Thereafter, the Utility would theoretically need to negotiate free City Collections Division disposal with the Landfill's buyer and implement inflationary-like rate adjustments to ensure ongoing financial sustainability throughout the projection period and to prevent the future need for large rate adjustments.

The 5-year plan of recommended rate adjustments along with the average residential bill is shown in the table below. Detailed schedules reflecting all of the data and assumptions used in this analysis are available in a later section of this Report and in **Appendix B**.

Rate Revenue Adjustments

	Current	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Rate Adjustment	0.00%	30.00%	30.00%	3.00%	3.00%	3.00%
Average Residential Bill	$22.00	$28.60	$37.18	$38.30	$39.44	$40.63

E.4 KEY CONCLUSIONS/RECOMMENDATIONS

Key conclusions and/or recommendations are as follows:

1. **The City is approaching its debt ceiling**, which is largely attributable to ISWMF borrowing. Despite this, the City still has large financial obligations related to the ISWMF on the immediate horizon and no alternative means to raise the capital. The most notable and pressing obligation is the closure and capping of the Permit No. 498 landfill, estimated to cost just under $5.2 million by the City's engineer. $1 million of this figure is variable in either direction or may not need to be incurred at all; it is attributed to the possibility for required environmental remediation which will only be discoverable once closure activities begin. The Virginia Department of Environmental Quality (VDEQ) mandates the 498 landfill be closed by FY 2022. In addition, closure of the active Permit No. 588 landfill (which is presently not expected to occur for many decades) is estimated to cost $7.6 million.
2. **The ISWMF's ongoing annual debt service obligations are over $2 million annually** and will remain as such almost through the end of the next decade. Based on our background review and observations at the ISWMF, these costs, while not necessarily indicative of an operationally unstainable current program, show that large injections of outside capital (primarily in the form of general fund monies and bonds) over the landfill's life were insufficient to fund replacement of ISWMF equipment and infrastructure, let alone reserves for equipment replacement or the aforementioned major landfill closure obligations such as closure care (CC) and post-closure care (PCC).
3. **The active Permit No. 588 quarry landfill incurs high lining costs due to its vertical nature.** These costs were calculated at an average of about $4 per ton of material disposed in the

quarry cell incurred as a $2.5 million project about every three years. Note these costs do not include initial Quarry Landfill development costs nor an approximately $10 million investment associated with rebuilding the entrance road/ramp in 2010. On a national level, there are limited landfill facilities built into converted quarries to compare cell construction costs to for benchmarking purposes, but it is apparent that the vertical format of the lining operations makes quarry landfilling, or at least serpentine-shaped quarry landfilling, more costly than traditional landfilling.

4. **Tipping fees charged to haulers do not reflect the actual cost of waste disposal.** The calculated cost of disposal per ton of landfilled material hovers in the vicinity of $34 to $40 per ton. Despite this, the unit tipping fees assessed at the ISWMF to private and public outside haulers vary from about $16 per ton to $22 per ton. Therefore, for many customers, the City is losing somewhere in the ballpark of $12 to $24 per ton of material it accepts. In essence, City taxpayers and collections program customers have been and continue to subsidize the disposal of waste by private businesses and localities located outside of the City.

1 INTRODUCTION

BACKGROUND

The City of Bristol, Virginia (City) is an independent city with approximately 17,000 residents which measures about 13 square miles. It is surrounded to the North, East, and West by Washington County, Virginia, and is bordered on the south by (and shares its downtown with) Bristol, Tennessee, located in Sullivan County, Tennessee.

The City's solid waste utility operations are performed by the City's Solid Waste Enterprise Fund. The Utility consists of a Collection Division and Disposal Division. The Collection Division is responsible for the curbside collection of waste and diverted material. The Disposal Division operates an Integrated Solid Waste Management Facility (ISWMF) for materials management and disposal.

Historically, City management has been averse to implementing regular annual rate or tipping fee increases, so the Utility has not kept pace with its operating, debt, and capital cost increases since the Landfill was established in 1998.

In recent years, the Utility's financial situation has gotten worse and the City turned to long-term borrowing for routine capital projects, such as landfill liners for the Quarry Landfill, which need to be added approximately every 3 years. Since the Enterprise Fund was in no financial position to issue revenue bonds, the City turned to issuing General Obligation debt to fund these projects. Additionally, until recently the City paid only interest payments on the debt and has repeatedly refinanced, adding to the Utility's debt burden. The Utility's portion of the General Obligation debt is approximately $33.8 million in FY 2020 and requires annual debt service payments in excess of $2 million per year. This amount represents over 36% of the Utility's operating budget in FY 2020. As a result, although an Enterprise Fund is a business-type activity and intended to be self-supporting, Bristol's Solid Waste Enterprise Fund has been subsidized by annual transfers in from the City's General Fund.

The City is no longer in a position to borrow, as the City is approaching its debt ceiling. The Utility wishes to cash fund its future landfill liner installations. In FY 2028, the Utility's annual debt service obligation will begin to decrease, as some of the debt issuances will be retiring in FY 2027. Consequently, the City recognizes the need to make a financial management plan that will allow them remain financially sustainable until that time.

The City is now led by a relatively new Council and City Manager. They recognize that the General Fund cannot financially afford to continue annual transfers to the Solid Waste Enterprise Fund and that the fund needs to have rates and tipping fees that recover the cost to provide collection services and operate the ISWMF. Therefore, in July 2018, the City retained SCS Engineers (SCS) to conduct an Independent Cost Analysis (Analysis) of the Solid Waste Enterprise Fund's Collection and Disposal Divisions.

OBJECTIVES

The principal objectives of the Analysis are as follows:

Perform an Operational Assessment of the ISWMF – Conduct a site reconnaissance of the ISWMF to observe site conditions and review waste and material handling, processing, and disposal operations for purposes of understanding the capital and operational expenses associated with the Disposal Division.

Perform a Revenue Sufficiency Analysis (RSA) – Develop a multi-year forecasting model for the City's Solid Waste Disposal and Collection Divisions that will determine the level of annual revenue required to satisfy its projected annual operating, debt service, and capital cost requirements as well as maintain adequate operating reserves.

Examine Potential Scenarios – The Analysis examines four potential scenarios for improving the financial structure and sustainability of the Enterprise Fund that the City is interested in exploring. These potential scenarios are described below and the associated level of rate adjustments and/or costs to the City for each scenario being considered are identified and presented in this report.

- **Increase Rates:** Examine the impact to the City's collections customer rates and/or the ISWMF tipping fees to recover the costs associated with providing collections and disposal services to the City's customers.

- **Reduce Expenses:** Analyze the City's current solid waste collections and processing/disposal programs and the related expenses and capital costs in order to identify potential expense reductions.

- **Landfill Closure:** Consider whether the City can cease waste disposal operations in the active landfill cell within the ISWMF and implement closure at the current configuration. The cessation of waste disposal operations at the ISWMF would necessitate that the City pursue one of three strategies to manage the waste collected by the Collection Division: 1) construct a new solid waste transfer station; 2) utilize the existing baling facility building at the ISWMF as a transfer station; or, 3) direct-haul the waste collections vehicles to an alternate disposal facility. The associated costs with implementing closure of the active landfill cell and implementing an alternative strategy to dispose of the waste collected by the Collection Division are estimated in this report.

- **ISWMF Sale or Privatization:** Based on a review of available information on recent landfill sales in the area, consider whether the City could sell all (or a portion) of the assets that comprise the ISWMF and evaluate the impact on the Enterprise Fund based on certain assumptions for continued ability to utilize the active landfill cell and other material processing elements of the ISWMF. A related sub-alternative is to consider if improvements to the financial structure and sustainability of the Enterprise Fund can be achieved by privatizing the operations of the ISWMF to a private-sector third-party operations contractor while maintaining ownership of the Facility.

2 OPERATIONAL REVIEW, SITE VISIT, AND DATA ANALYSIS

SOLID WASTE COLLECTIONS

The City's Collection Division performs services for City residents and businesses as part of the Public Works Department. In conjunction with the Disposal Division, the finances associated with its operations are contained within the Solid Waste Enterprise Fund. Solid waste collections are classified as either residential or commercial.

Residential

The City of Bristol maintains a highly-integrated, high-service-level model of solid waste collections for its citizens. This is reflected by both the curbside and drop-off services offered to residents. Waste and diverted materials collected from residences makes up the majority of material collected by the City. Diverted materials comprise items that are not ultimately disposed of in the active landfill cell, such as recyclable materials, yard waste, etc.

Curbside: Residents of Bristol may discard their household garbage (MSW), bulk trash, yard waste/brush, leaves, and grass clippings via the City-operated curbside collections program. Bagged MSW is collected weekly as long as it is placed inside the resident's MSW roll-out can, which must be positioned in an unobstructed manner on the curb so that the automated collection truck may service it. There are exceptions to this requirement for physically challenged residents requiring a physician's certification that they cannot transport their roll-out can from their house to the curb.

In addition, bulk trash and large quantities of yard waste/brush are collected weekly from the curb via a knuckleboom truck (small quantities of yard waste may be placed in the MSW roll-out can) on the same day as MSW collection as time allows. Bulk trash is disposed of in the landfill and yard waste/brush is brought to the ISWMF's yard waste operations area, where it is chipped for mulch.

Vacuum truck curbside service is offered for collection of loose organic materials including grass and leaves. Grass collection occurs from May until October and leaf collection occurs from October to December; these materials are used as feedstock for the composting operation located at the ISWMF.

Drop-Off: Collection of traditional recyclables occurs at five Recycling Drop-off locations throughout the City and includes newspaper, junk mail, phonebooks, magazines, catalogs, aluminum, #1 and #2 plastics, steel cans, tin cans, all of which is accepted as a comingled stream, and Old Corrugated Cardboard (OCC). These locations are generally composed of one comingled roll-off container and one OCC roll-off container. OCC is aggregated and periodically baled for export from the City's transfer station located at the ISWMF. Note that the City does not accept glass. The collection center locations are generally located on City-owned property and include the following:

- **City Athletic Fields:** Off Cardinal Drive near the intersection of Bonham Road and Old Airport Road.
- **Washington-Lee Elementary School:** At 900 Washington Lee Drive.
- **Cumberland Square Park:** Near the intersection of Lee Street and Scott Street (gravel courthouse parking lot across from 220 Lee St).
- **Gene Malcolm Stadium**: 1501 Euclid Ave near the intersection of Euclid Avenue and Division Street (end of paved parking lot).

- **ISWMF:** Off Shakesville Road near its intersection with Kings Mill Pike and Valley Drive (only fenced in site, but limited hours due to illegal dumping; M - F, 7 AM - 4 PM).

The City collects Household Hazardous Waste (HHW) at no charge from its citizen's with proof of residency on its annual HHW and electronic waste (e-waste) collection day. Types of HHW materials accepted include: antifreeze, paint and thinners, herbicides, aerosols, pool chemicals, mercury debris, cleaners, used oil, gasoline, adhesives, solvents, kerosene, batteries, propane tanks, pesticides, fertilizers, and light bulbs. The City also collects e-waste such as used televisions and computers at no charge during this once-a-year event, even from non-residents.

Table 1 below presents a summary of material collections offered to City residents.

Table 1. Collections Division Material Collection Offerings to City Residents

Material	Main Collection Format	Season (if applicable)	Frequency
Household Garbage	Curbside: Roll-off Can	NA	Weekly
Bulk Trash	Curbside: Knuckleboom	NA	Weekly as time allows
Yard Waste/Brush	Curbside: Knuckleboom	NA	Weekly, possible delay
Grass	Curbside: Vacuum Truck	May - Oct	Weekly as time allows
Leaves	Curbside: Vacuum Truck	Oct - Dec	Weekly as time allows
Traditional Recyclables	Drop-Off: 5 Centers	NA	Continuous
HHW	Drop-Off: Annual Event	Usually May	Annual
Electronic Waste	Drop-Off: Annual Event	Usually May	Annual

Commercial/Institutional

The Collections Division also maintains a non-residential collections program and rents out waste containers of various sizes and collection frequencies to various commercial and institutional entities (such as from City's public school system) located within the City. The City competes to be the collection hauler for its private businesses with various private haulers in the region.

INTEGRATED SOLID WASTE MANAGEMENT FACILITY

The ISWMF on 2125 Shakesville Road is positioned on 138 acres in the southeast corner of the City surrounded by mostly other City-owned property. The Facility collectively totals about 220 acres, which equates to around three percent of the total land area of the city. The integrated Facility maintains a diverse array of materials management and disposal operations which includes the following.

Landfilling

There are three permitted landfills at the ISWMF, two of which are inactive. They include the following:

- **Solid Waste Permit No. 588 (Active):** This waste disposal unit, also referred to as the Quarry Landfill or Quarry Cell, has accepted waste since March 1998. This is the only landfill at the ISWMF in which active waste placement operations are occurring. Waste is disposed in the former quarry, which represents approximately 7.7 million cubic yards of total capacity based

on current design drawings. Of this volume, approximately 3.5 million cubic yards of airspace has been consumed by the waste placed from March 1998 until December 2017, corresponding to approximately 45 percent of the airspace. At 4,285,840 cubic yards, the calculated remaining airspace as of December 2017 represents approximately 27 years of remaining filling capacity, assuming the waste acceptance quantities and waste density remains similar to recent years.

The quarry landfill is unique in Virginia and is somewhat unusual in terms of basegrades, liner system, gradient control system, and other design characteristics within the US. It is equipped with an active landfill gas (LFG) collection and control system (LFGCCS) with 11 extraction wells that deliver gas to an on-site power plant where it is combusted for electricity. It also is equipped with a double liner and leachate collection system. A specialized liner crew extends the side wall liner every two to three years, and during filling operations, special measures must be taken to protect its integrity. This includes layering measures such as filling with a special non-reactive imported rock, referred to as buffer rock, adjacent to the liner around the perimeter of the cell, and then with baled MSW after that.

Wastewater quantities collected from the Permit No. 588 waste disposal unit and delivered to the Bristol Virginia Utilities (BVU) wastewater treatment plant average approximately 148,000 gallons per day (GPD). Of this wastewater flow rate, approximately 103,000 GPD is gradient control water and 44,400 GPD is leachate.

In 2018, the future closure costs for the Permit No. 588 landfill were estimated to be approximately $7.6 million by the City's solid waste engineering consultant. In addition, the total 30-year post closure cost (PCC) was estimated to be approximately $5.1 million.

- Solid Waste Permit No. 498 (Inactive): This waste disposal unit accepted waste from 1986 to 2002. Daily and intermediate soil cover material from this inactive landfill is currently being reclaimed through landfill mining in order to reduce the quantity of soil required to be extracted from the Facility's borrow pit for operation of the active landfill cell (Permit No. 588). The inactive landfill unit is equipped with an LFGCCS that delivers gas to the power plant. The landfill's capacity is 1,199,224 cubic yards and a portion of it has a bottom liner system and is equipped with a leachate collection system. The leachate flowrate is approximately 7,530 GPD.

  In 2018, the future closure costs for the Permit No. 498 landfill were estimated to be approximately $3.1 million by the City's solid waste engineering consultant. In addition, the total 30-year post closure cost (PCC) was estimated to be approximately $1.9 million and the corrective action cost was estimated to be $1 million.

- Solid Waste Permit No. 221 (Closed): This waste disposal unit accepted waste from 1977 to 1986. The closed landfill is equipped with an LFGCCS with 15 extraction wells that deliver gas to the power plant. Located in the Northeast corner of the Facility near its back entrance, this is the closest of the three landfills to the residential properties located along Shakesville Road.

Additionally, the ISWMF accepts uncontaminated inert debris to fill an excavated area called the "Shale Pit" in reference to the Facility's mining history. This area only receives inert material such as concrete rubble, cinderblock, brick, and asphalt and does not require a solid waste permit.

Organics Management

Since the City's Collection Division collects a significant amount of organic waste material, there are two primary areas at the ISWMF where organics are stockpiled and processed separately from landfilling operations. They include the mulching area and composting area, summarized below.

- **Mulching Area**: Receives all of the yard waste/brush accepted at the ISWMF and is a dedicated space for stockpiling the feedstock material until it can be chipped into mulch for use by the City or distributed to residents. Chipping occurs once per year by contracting with a third-party company that uses a tub grinder to reduce the size of the material and form stockpiles, sometimes segregated by source material. For an additional cost, the third-party vendor will doublegrind select material for distribution to customers desiring a finer mulch or for utilization in the City's composting program.

- **Composting Area (PBR 525)**: Although permitted to receive 5,000 tons per year (TPY), the City's Composting operation received an average of 1,894 TPY from 2012 to 2017. This Facility accepts all of the grass clippings and leaves from the City Collection Division and processes the material via a windrow composting process. During and after periods of peak material influx, the City utilizes a 1.6-acre rectangular asphalt pad to manage six to seven 300-foot long windrows at various stages of the composting process.

  The City used a Scarab turner which was recently replaced by a used turner with an identical model number to till and aerate the approximately 6-foot tall windrows until the material is completely cured. After curing, the finished product is transferred to a nearby compost storage bunker. Finished compost is available for sale in bags (priced at $3 per bag) or in bulk at a price of $32/ton. ISWMF personnel will also load customers' truck beds or trailers at no cost during the work week and, on Tuesdays and Wednesdays during the late spring and summer, will deliver compost to City residents for a fee of $10 per load.

Recycling and Transfer

Several areas within the ISWMF are dedicated to the transfer, processing, or recovery of recyclable material other than organics. These areas include:

- **Transfer Station/Baling Facility (PBR 121):** Permitted to process 450 tons per day (TPD) and located at the very rim of the Quarry Cell, this facility was constructed as a transfer and baling area for the waste destined to be placed in the active landfill (Permit No. 588) when it was operated to receive only baled waste. In the past, all solid waste material arriving at the Facility was unloaded through one of the building's six bay doors and then compacted and baled in one of two balers. This double handling of material was not sustainable, and the Quarry Landfill operations were changed to place baled waste only around the sidewall of the Quarry Cell. Now the transfer station/baling facility is used to temporarily stockpile and bale OCC when necessary and from 2013 to 2017, only baled less than 10 tons of material per day. At 20,200 square feet in floor area and having a permitted throughput limit of 450 TPD, it has potential for use as a dedicated transfer station if needed.

- **Tire Processing Facility (PBR 116):** Although it processed on average 300 tons of tires per year from 2012 to 2017 and is permitted to store 30,000 tires, the tire processing facility is currently inactive and in disrepair. The City accepts tires at a cost of $6 per tire (about $115 per ton) and disposes of them at a cost of $65 per ton to a processer in Tennessee.

Considering the estimated total handling, transport, and disposal cost for tires is $90 per ton, the tire program is considered a net revenue source for the City.

- White Goods Pad: A 260-feet by 120-feet (30,000 square feet in area) trapezoidal asphalt pad located near the entrance to the ISWMF is used for extra container storage and white goods processing to remove hazardous substances such as Freon and CFCs prior to scrap metal recycling.

ISWMF personnel also pull scrap metal, aluminum, and tires from the Permit No. 588 landfill working face.

Other Infrastructure

Miscellaneous infrastructure located at the ISWMF includes:

- LFG Power Plant: A landfill gas-to-energy power plant operated by Ingenco (now CCI or Riverview) utilizing diesel engines equipped to combust LFG was constructed at the Facility around 2015.

- Scales and Admin Building: Located at the very entrance to the ISWMF is the scalehouse and administration building. A single scale services the Facility, thereby requiring inbound vehicles to occasionally wait while outbound vehicles are reweighed, or vice versa.

- Leachate Storage Tank: A 200,000-gallon leachate aboveground storage tank (AST) is located near the entrance to the Facility. The integrity of the AST is questionable and the City acknowledges it should be rehabilitated and repaired to serve as emergency storage contingency or the City should demolish and remove this underutilized structure because the AST is unnecessary; the Facility is not required to treat its own leachate and can pump it directly to the wastewater utility.

- Unused Asphalt Pad: A 260 feet by 170 feet (44,000 square feet in area) pentagonal (with one side concave) pad is situated just south of the Ingenco Power Plant and just North of the Shale Pit. This pad used to be used for additional compost operations, but in recent years is only used for miscellaneous storage.

Prior to completing the financial model, SCS performed a site reconnaissance of the ISWMF and analyzed data provided by the City. In conjunction with the background review, these activities provided additional context and information for the modeling effort.

SITE RECONNAISSANCE

On September 10, 2018, representatives from SCS engaged in a site reconnaissance to the ISWMF. The purpose of this site visit was to identify significant site conditions and Disposal Division program issues that represent important considerations in the financial modeling effort or otherwise impact the Enterprise Fund. These needs included those associated with operations and maintenance (O&M) as well as capital infrastructure. The primary components of the site visit included personnel interviews and a site tour.

Personnel Interviews

During the site visit, SCS personnel engaged in conversations with Department of Public Works employees in management positions within the Collection and Disposal Divisions. These conversations served to glean insights and findings directly from those Public Works Department employees most intimately involved in the operational decisions that impact ISWMF and waste collections system activities. In part because of the unique configuration of the ISWMF, management personnel reported considerable operational challenges pertaining to waste placement operations, filling sequence, leachate and gradient control water management, stormwater management, capital depreciation, and other program operations.

Site Tour

SCS personnel performed a site reconnaissance of the ISWMF in which we observed various features and operational aspects of the Facility, which is shown in **Exhibit 1**. The site visit yielded the primary findings outlined in **Exhibit 2.**

Exhibit 1. Bristol Integrated Solid Waste Management Facility (ISWMF)

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Exhibit 2. Site Tour Findings

- The **Leachate Pumping Station** at the rim of the Quarry Cell appears to be in need of replacement and updating at a minimum. The Programmable Logic Controller (PLC) is outdated and the system has not been updated since initial waste placement operations commenced over 20 years ago.

- The integrity of the main **Leachate Storage Tank** located near the ISWMF entrance is compromised and it needst to be repaired and/or replaced to serve as an emergency storage vessel. Alternatively, if deemed unnecessary, the tank should be removed.

- Select large **Facility infrastructure investments appear unutilized**, (or at least underutilized) including the Transfer Station, asphalt pad near Ingenco, and Tire Processing Facility.

- The existing **Composting Area** appears to have insufficient drainage, slow throughput due to inputs (leaves and grass only), and a slow aeration/turning process per managed unit of material due to old equipment and lack of economies of scale.

- Many of the City's **miscellaneous roll-off containers** in storage or used for collection of materials at its 5 reyclcing sites appear fully depreciated (rusted, unsafe) and are beyond the point of repair, require replacing, and may be retired for their salvage value .

- Facility personnel reported **operational issues in the Transfer Station** with the one working baler due to the location of the equipment controls. Aggregated OCC appeared to be backed-up, presenting a fire hazard; there did not appear to be a ceiling sprinkler system.

- There was an indication of **general equipment depreciation** at the ISWMF. Facility personnel report needing new bulldozer, skid steer, and collection truck, all currently handled via lease.

DATA ANALYSES

The City provided SCS with a variety of electronic files including documents and reports detailing various aspects of the Public Works Department's Solid Waste Collection and Disposal Divisions operations. A summary of the files provided listed by category is included in **Table 2** below:

Table 2. Background Documents Received

Category/File Name	Document Notes	No. Files
Landfill Summary		1
Unaudited Trial Balance	FY18	1
Budget Information	FY 2015 - 2019	1
Current CIP Budget		1
Closure-Post Closure Estimates	Notes to Fin Statements & FY18 FA	6
Staffing Needs		1
Debt Information		1
Current Rate Ordinance		1
Proposed Rates w/Rate History		1
Commercial Container Accounts Report		1
Annual/Temp Waste Container Permits by Customer	FY18 Sum & 13 Indiv Com Rprts	14
Paying Residents Container Report		1
Billed Tonnages Revenue Report		1
Collections Revenue Report		1
Disposal Tonnage Totals		1
Recycling Revenue Report	FYs 2015, 16, 17 & 18	4
Yearly Collection Refuse Data	FY 2008 - 2018	1
Solid Waste Ordinance Chapter 70		1
Fund Balance Policy		1
Disposal Contracts		22
Airspace and Density Calculations		4
Weekly FY18	Weekly disposal reports by source	1
FY18 Daily Report - Scale House		1
Disposal Tonnages totals w/Liner Cost Analysis		1
Various Add'l Correspondence as Needed		NA

Select analyses were performed which revealed certain estimated parameters used for the financial modeling effort as well as other insights. Some of these findings are presented in the following sections.

Materials Quantities Analysis

The City provided SCS an Excel workbook containing annual total quantities of accepted material, in units of weight (tons), from FY 2003 through FY 2018 for "disposal". Note "disposal" does not include "Other" material such as trash/dirt from the trommel, tires, traditional recyclables, and quarry rock which crossed the scales of the ISWMF but was diverted or used for special purposes.

The amount of material disposed averaged 170,000 tons per year for the 16-year period; the maximum amount accepted was 203,000 tons in 2004 and the minimum amount accepted was 116,500 in 2014. The amount disposed in 2018 was 154,000 tons. **Figure 1** presents the disposal quantities of MSW, C&D debris, and special waste in the Permit No. 588 landfill as well as auxiliary material management quantities. MSW and C&D quantities make up an average of 93% of historical material quantities accepted at the ISWMF, allowing better economies of scales than activities such as yard waste/brush management, wood chipping, disposal of inert material (in the shale pit), and special waste/white goods processing. These activities generally incur expenses at a higher rate per ton or cubic yard of material managed because they take more operator/labor hours, maintenance, fuel, and capital improvements on a unit basis than landfilling. In addition, **Figure 1** demonstrates the overall decline in MSW tonnages over time, although there has been a slight rebound of total quantities in recent years.

Figure 1. Material Disposal/Management Quantities Over Time

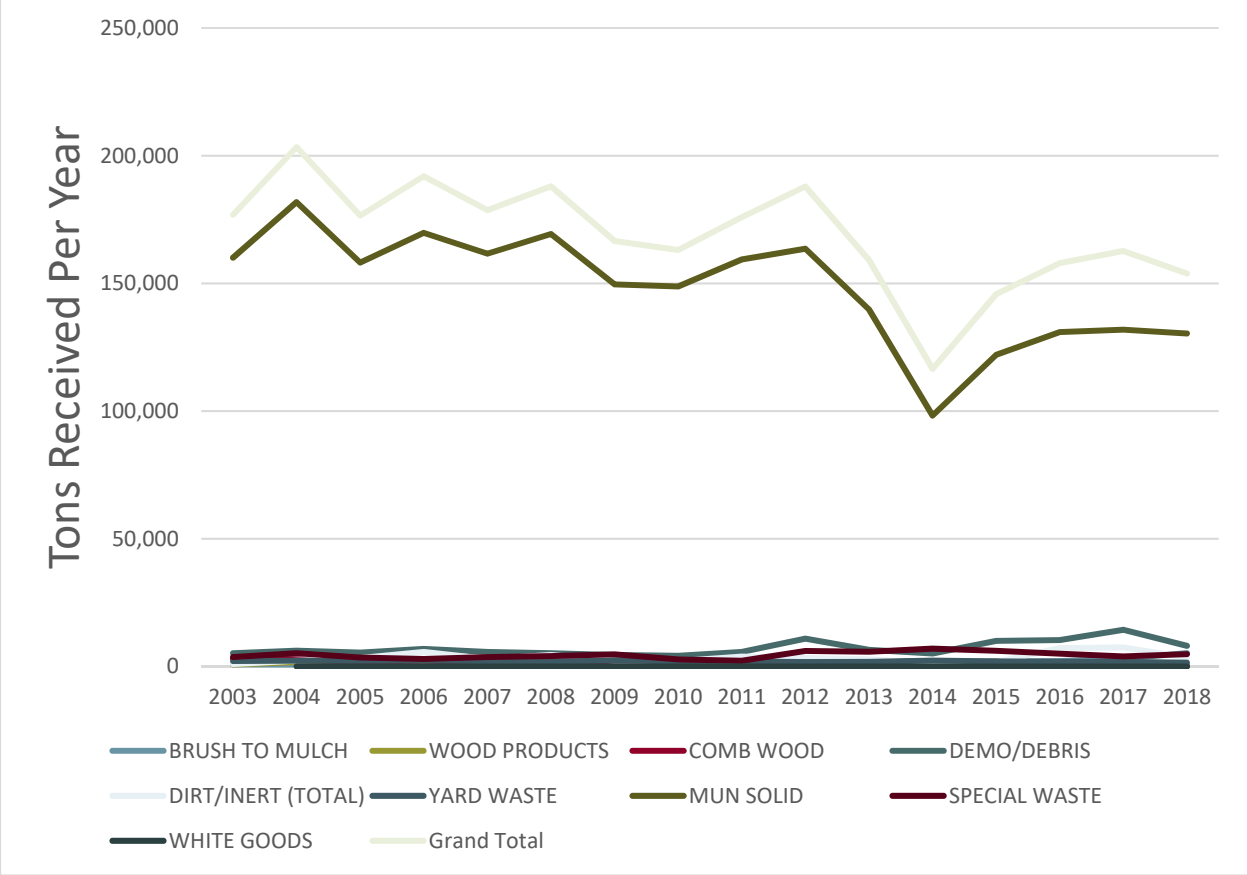
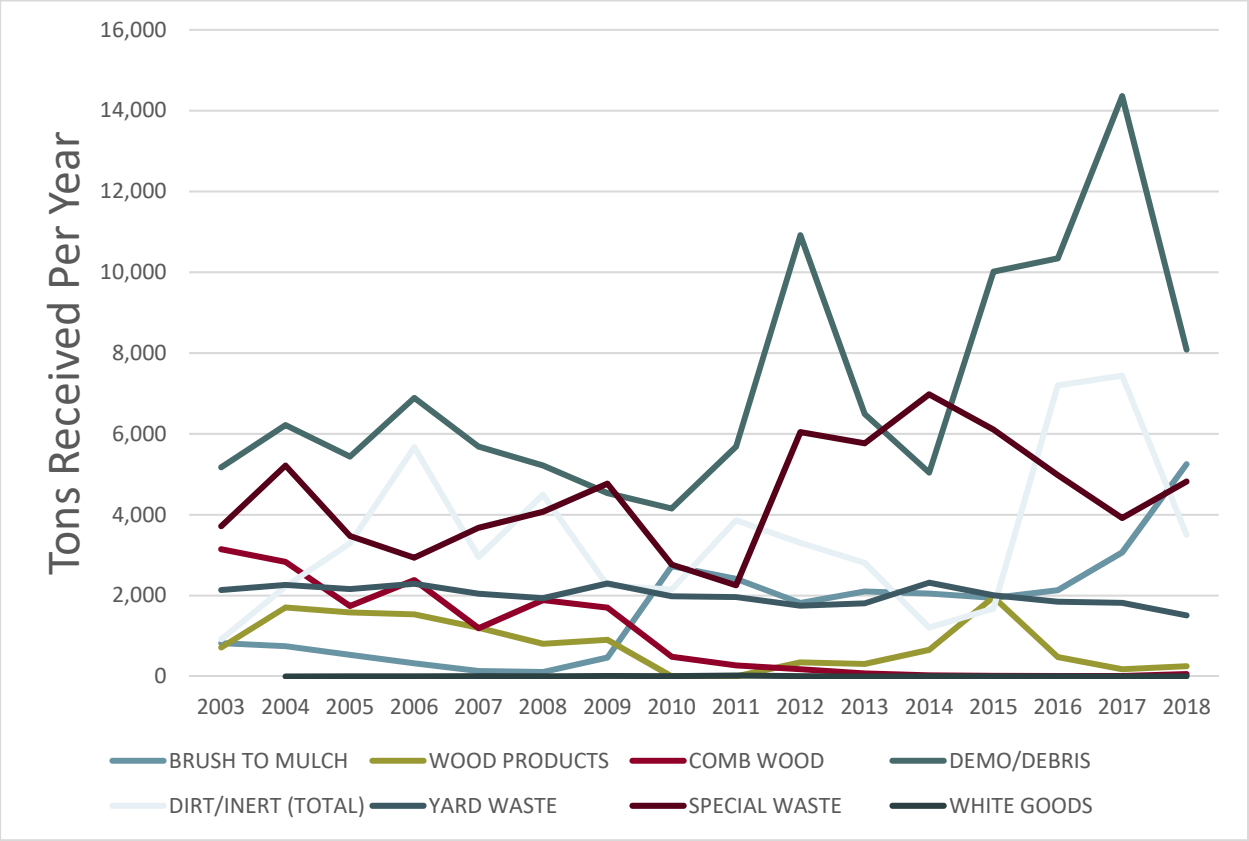


Figure 2 demonstrates an additional potential obstacle to an economically viable business model: variable material quantities from year to year may make auxiliary material management operations difficult to scale appropriately. This might include operations associated with composting, mulching, yard waste management, and wood products disposal (formerly combustion).

Figure 2. Material Disposal/Management Quantities Over Time (no MSW/Grand Total)

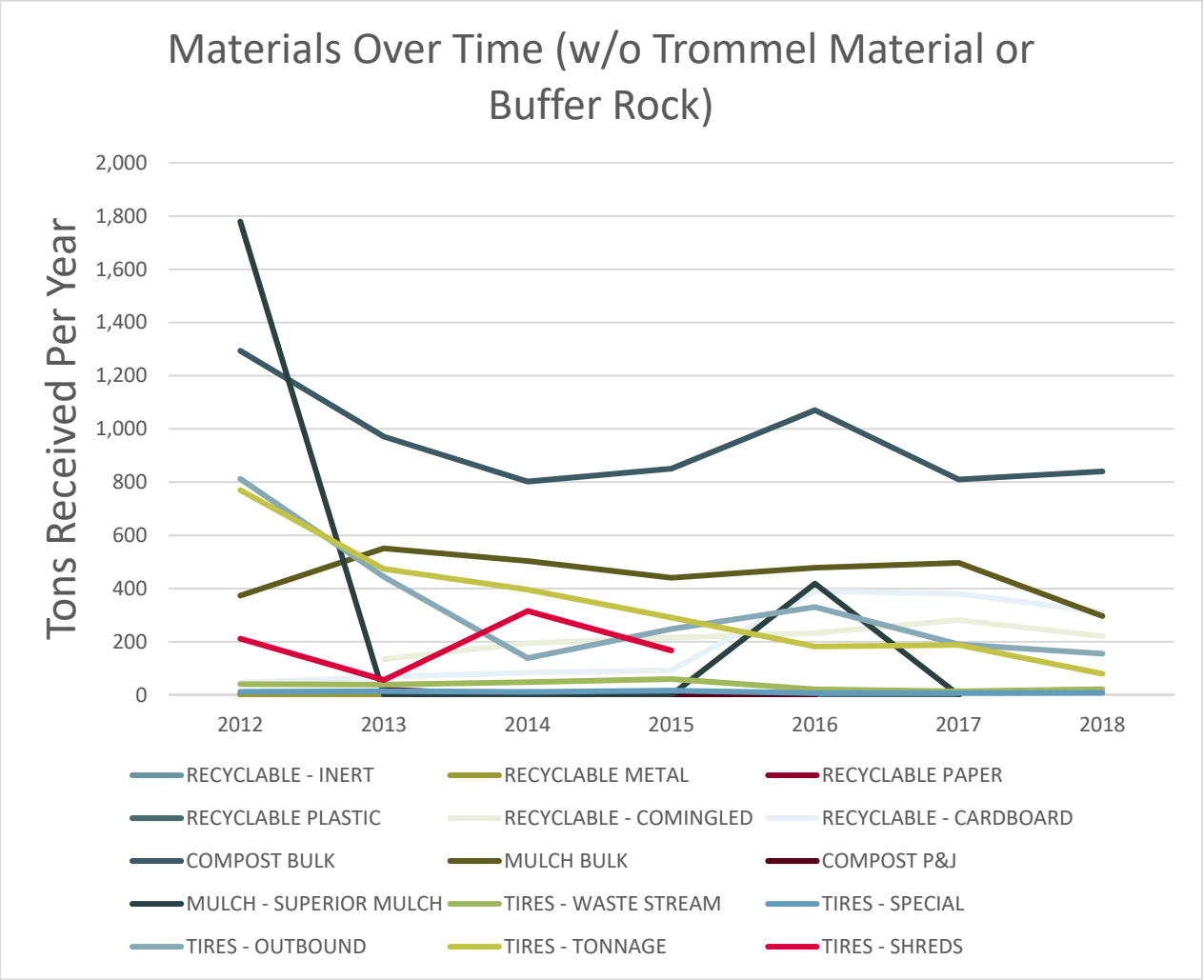


By focusing on just the core operation of waste disposal, or by only maintaining operations which avoid expenses or result in net income from the sale of value-added products, the City's for-profit landfill competitors in the region may be able to improve their bottom line relative to the City's Enterprise Fund and thereby offer a lower tipping fee than the ISWMF.

The quantities shown in the previous figures do not include other weighed materials such as recyclables and tires. **Figure 3** shows the quantities of these materials managed over time. Note the trommel-sorted material recovered from the Permit No. 498 landfill and buffer rock imported from various quarries have been excluded from the figure due to the scale.

The management of "small stream materials" (recycling, tires, etc.) shown in **Figure 3** below present the same issues noted above, which is that multiple small stream materials reduce economies of scale and increase the cost of operations for the City on a basis of per-ton materials managed. Because the economic reward (opportunity cost) of diverting material from disposal in the Permit No. 588 Landfill is low owing to the low tipping fees in the region, the monetary benefit of diverting material from landfill disposal is not as high as it is for many Virginia localities without their own landfill or in areas with limited (or distant) disposal facility options and high tipping fees.

Figure 3. "Small Stream Material" Quantities Managed Over Time



Major Disposal Customers Analysis

Disposal Operating Revenue (about $3.1 million in FY 2018) is comprised of solid waste disposal fees (referred to as "tipping revenue"), recycling income, and mulch/compost sales and makes up the majority of the revenue of the Enterprise Fund, which also includes Collections Operating Revenue (about $1.5 million in FY 2018) made up of waste collection fees charged to City citizens and commercial dumpster permit fees. The vast majority of solid waste disposal fee ($3.06 million in FY 2018, or about 97% of total Disposal Operating Revenue) comes from major customers, which consist of both commercial haulers and neighboring localities.

The high degree of dependence on these select few customers reflects a risk to the fiscal viability of the City's Disposal Operating Revenue, because of uncertainty as to whether these customers will renew their contract and the tipping fee price of each renewal. In addition, the general competitiveness of landfill disposal pricing in the region drives the tipping fees to a level that is insufficient to balance the actual costs of the service. Notably, six customers in particular each bring in more than $200,000, which represents 7.5% of solid waste disposal fee revenue; these customers are JPSA Wythe/Bland Counties, Smyth County, City of Bristol Tennessee, Avery County,

Lee County, and Waste Industries. Collectively, these customers make up about 67% of outside tipping revenue.

Notably, the customers with the highest waste quantities per vehicle count (weighed vehicles greater than 15 tons) are given by JPSA Wythe/Bland, Lee County, Smyth County, and Avery County, indicating optimized transfer trailer use. The customers with the smallest quantities disposed per vehicle count were Lusk Disposal, DH Griffin Wrecking, Southwest Disposal, Town of Abingdon, and City of Bristol Tennessee. The former customers are more likely to travel further for a lower tipping fee because their cost to transport a unit of waste a mile is relatively low, but they may be more sensitive to tipping areas constricted by size or other impediments to large vehicles. Conversely, the latter customers are more likely to prefer convenience because of their small loads and lack of economies of scale for traveling further, but they likely do not care as much about the size of the tipping area.

Discussions with City personnel revealed that drivers/haulers typically prefer the City's access road and convenience to that of its competitors, so there may be an elasticity of demand associated with the local waste disposal market that is slightly in the City's favor. The City also offers (or can offer) waste management services which its competitors cannot, such as recycling, a transfer station/baler facility, metals/appliance processing and recovery, tire processing, and organics management services. Certain offerings, such as the ability to purchase mulch and compost, may be appealing to residential or small-business customers with high individual use of the landfill, such as those from the City, Bristol Tennessee, and City of Abingdon.

Landfill Permit No. 588 Unity Liner Costs

The Permit No. 588 Landfill incurs high capital costs and other challenges associated with its vertical lining system. The City provided SCS with capital cost data (69 invoices) associated with lining efforts since FY 2003 in conjunction with the respective waste amounts received during the same time period. Using the data, an average capital lining cost per unit of waste disposed in the landfill was calculated. SCS adjusted the pre-2018 liner expenses from this data to equal 2018 dollars, and calculated the following:

- **Unadjusted Liner Invoice Totals Since FY03**: $9.85 million
- **Adjusted Liner Invoice Totals Since FY03 (2018 dollars):** $11.6 million
- **Adjusted Annual Invoice Totals**: $682,000/year
- **Total Tons Landfilled in Landfill Permit No. 588 (since FY 03)**: Just under 3 million tons
- **Liner Cost Per Ton Waste Since FY03:** $3.94/ton; equals approx. $4/ton disposed

Based on a rough review of various in-house data, SCS concludes the $4/ton landfill lining and cell development cost is lower than may be expected at a traditionally configured landfill owned by a single locality in Virginia ($5 - $10/ton), but slightly higher than what would be expected at a private-sector landfill or large regional landfill ($1 - $3/ton). Lining costs appear high primarily in the context of the City's assessed average tipping rate rather than an absolute basis, or a per unit of waste basis, although the slightly higher lining cost relative to what may be expected at a private landfill could contribute to the ISWMF's difficulty in matching competitors' prices.

It should be noted that the City's recurring cell development costs are almost entirely from lining, whereas at a typical landfill, a significant portion of the cell development costs would be from cell grading and excavation, costs not incurred with the Quarry Landfill configuration. Note the $4 per ton cost does not include significant Quarry Cell development costs outside of lining which include:

- Costs of unknown amount incurred at the onset of the Quarry Landfill's development, and
- Costs in excess of $10 million which were incurred during a 2010 redevelopment of the ISWMF's roadways as well as improvements to the ramp leading up to the quarry disposal unit.

Adding in these costs is believed to approximately double the unit cost of disposal given above; however, this was not explored as thoroughly as the impact of lining on costs because they are sunk and not recurring expenses.

Tire Processing Facility Analysis

SCS examined the potential to generate revenue from the City's tire processing facility, which is permitted to store up to 30,000 tires under PBR 116 and currently is non-functional and in need of repair. The City sent approximately 265 tons of tires to its external tire recycling contractor in FY 2018 which corresponds to approximately 15,000 tires. After the external tire processing facility ceased operations, the City's tires were discarded at a cost of approximately $90 per ton, or about almost $25,000 per year, although the City recently won a contract to discard them at $65 per ton, or about $19,000 per year.

SCS explored the possibility of processing and recycling the tires internally in lieu of offloading them to an outside contractor. Like that of any recyclable processed material, the market for shredded tires is dependent on product quality. Any tires that have been laying stagnant and degrading for a while might not be acceptable for recycling. Historically the City used its PBR 116 facility for tire management via size reduction paired with disposal in an on-site incinerator, which was located near the current location of the power plant. The City's tire processing facility may not be sophisticated enough to prepare waste tires into a marketable product; regardless, what follows is a listing of potentially lucrative (or at least net-positive uses) of diverted tire (from least to highest use):

1. **Size reduction to 4"x10" or smaller for Alternate Daily Cover (ADC) for the landfill**. It is unclear if this would garner regulatory approval, but such a permission has been granted elsewhere. This likely wouldn't save much more than a small amount of cover material (currently soil from the borrow pit or Posi Shell). If the tires' ultimate destination was the landfill anyway, this might be the best way for the ISWMF to proceed. Under any tire recycling/diversion scenario, about 25% of the tire material would be a complete waste product (textile/filler material) anyway which be best disposed in the active Landfill, though this would cause it to fill up slightly faster.
2. **Chips sold to a broker who mixes with wood/coal to sell to power company or industrial boiler operator.** It is unclear if this would generate revenue or if there is a market for such a product in the first place, but SCS notes that this would complement the utilization of large chips noted below.
3. **Transformation into .25" crumb worth approximately $100-$150/ton**. Applications include asphalt floor mats. It is unclear if there is an application for this in Southwest Virginia, as this figure was obtained from a source in Northern Virginia.
4. **Use of 1.25"-1.75" chips used for playground cover or landscape mulch.** There is potential for high demand for this product because it's "green", stays bug-free, cleans itself, and can go 5-10 years without replacement, though sources abound which doubt its environmental safety. This and the third point have some good seasonal synergies, but the City would have to find buyers for both and manage the logistics accordingly. A fairly contaminated "fluffy" chipped tire is currently being sold online for approximately $10 per 1.55 cubic ft bag. Its price is about $530 per ton, although is individually bagged. Note that the City already has bagging infrastructure through its composting system.

5. **Resale of good tires to reusers** such as PROCO, a manufacturer of rubber expansion joints and check valves or Paul's Used Tires. The former is located in Manassas, Virginia; SCS did not identify a closer recycling establishment to the City. Note this would require an in-house tire manager with good judgement to segregate the good tires from the bad, but this could be used in conjunction with another scenario to enhance revenue.

Assuming *all* of the City's 15,000 tires corresponding to about 265 tons could be used in the fourth application listed above, the operation would result in sales of about $80,000 per year for crumb rubber and $8,000 per year for steel scrap. Approximately one-quarter of the material would be landfilled, using valuable Landfill airspace. A revenue-generating scenario would also eliminate the $20,000 cost currently incurred by the City to recycle its tires via the external contractor. O&M of the tire processer and marketing of the material in any of the applications above likely require at least one additional full time equivalent (FTE) employee to be hired at the ISWMF, offsetting most if not all of the revenues from such an operation. It should be noted, however, that a there are several privately-owned facility's which conduct profitable business using a combination of creativity and similarly-applied material recovery principles located in the local area of the City.

3 REVENUE SUFFICIENCY ANALYSIS

DESCRIPTION

This section presents the financial management plan and corresponding plan of solid waste rate adjustments developed in the Revenue Sufficiency Analysis (RSA). A description of the background data, assumptions, and policies reflected in the RSA, as well as the results of the RSA are presented below. Appendices A & B include detailed schedules supporting the recommended financial management plans identified herein.

In order to initialize the RSA, we obtained the City's historical and budgeted financial information regarding the Enterprise Fund and operation of the City's solid waste programs. We also obtained the City's multi-year capital improvement program (CIP) and current debt service obligations. We also discussed with City staff any other assumptions and policies that would affect the financial performance of the Fund, such as changes in tonnage and/or customer growth, operating reserves, cost increases affecting operating expenses, etc.

All of this information was entered into our revenue sufficiency model to produce a ten-year projection of the sufficiency of the Fund's revenues to meet all of its current and projected financial requirements and determined the level of rate adjustments necessary in each year of the projection period to provide sufficient revenues to fund all of the Fund's cost requirements.

SOURCE DATA

The following presents the key source data relied upon in conducting the RSA:

Beginning Fund Balances

Conversations with City staff and the Statement of Net Assets within the Financial Statements from the Independent Auditor's Report for the Fiscal Year Ended June 30, 2017 was used to establish the beginning FY 2018 balances for the Fund.

Revenues

The revenues utilized in the RSA reflect an evaluation of multiple years of historical results and the FY 2019 Budget. Revenues consist of curbside waste collection rate revenue, disposal fee (tipping fee) revenue, other minor revenue from miscellaneous charges, and transfers from the General Fund as described in the next subsection. Projections of future revenues are based upon historical actual results, adjusted annually to reflect assumed changes in customer growth and demand. Projections of all other revenues except the General Fund transfer are based upon the FY 2019 Budget.

General Fund Transfer

The RSA includes an annual transfer into the Enterprise Fund from the City's General Fund of approximately $1.37 million in FY 2018, $1.11 million in FY 2019, and about $607,000 in FY 2020 and each year thereafter. The City has been providing this transfer so that the Fund remains financially viable and plans to continue transfers throughout the projection period in an effort to minimize the rate impact on the City's customers.

Operating Expenditures

The operating expenditures include all operating and maintenance expenses associated with both Divisions, internal transfers, debt service requirements, and minor capital outlay. The RSA based operating expenditure projections on the individual expense categories and expenses amounts within the FY 2019 Budget, adjusted annually based upon assumed cost escalation factors that were reviewed with City staff (with the exception of annual debt service expenses which reflect the repayment schedules of each outstanding bond/loan).

Existing Debt Service

The annual repayment schedules for each outstanding revenue bond/loan were provided by and discussed in detail with City staff.

As the Fund has not issued revenue bonds, it has no debt service coverage requirements. The Fund's existing debt service obligations of approximately $33.8 million are General Obligation debt, issued with the full faith and backing of the City's General Fund.

It is assumed that the City will issue no further debt to support the Solid Waste Enterprise Fund and that the Utility will cash fund its future capital.

Capital Improvement Program

SCS and City staff discussed the landfill liner projects and trash cart replacements for FY 2018 through FY 2028. Beginning in FY 2020, the RSA includes an annual cost inflation factor of 3.0% (based upon recent increases observed in the Engineering News Record Construction Cost Index) to account for the inflation in the future cost of construction.

The RSA assumes $250,000 in additional capital spending every year beginning in FY 2021. This was added to account for future capital equipment needs of the Disposal Division, including those identified in SCS conversations with City staff and include items such as a leachate pump station, bulldozer for inert debris disposal, and compost turner.

In total, the Capital Improvement Plan (CIP) from FY 2018 – FY 2028 (including inflation) is approximately $10.2 million. A list of projects and costs by year is included on **Schedule 7 of Appendix A.**

ASSUMPTIONS

The following presents the key assumptions utilized in the RSA.

Cost Escalation

Annual cost escalation factors for the various types of operating and maintenance expenses were developed based upon a review of historical trends, our industry experience, and detailed discussions with City staff. The specific escalation factors assumed for the various categories of expenses are presented on **Schedule 2 of Appendix A.** In addition, for all modeled scenarios, tipping rates for select major commercial customers inflated based on a "Room to Run" analysis (to levels assumed to be the most the rates would bear without losing significant waste quantities) were included in addition to calculated Collections rate increases and ongoing inflationary adjustments by Scenario.

Interest Earnings on Invested Funds

Because the Enterprise Fund has been heavily dependent upon the General Fund to remain solvent and will continue to require transfers in from the General Fund throughout the projection period, it is assumed that any interest that is earned by funds flowing through the Fund belongs to the General Fund.

Collections and Disposal Customer/Revenue Projections

Based upon a review of recent historical customer account data and discussions with City staff, the RSA reflects a slight decrease of about 8 accounts per year for solid waste collection.

The projected change in revenues associated with contracted disposal accounts was calculated based upon a review of recent historical tonnage by hauler and discussions with City staff regarding expected changes in tonnage that will be coming into the landfill if the tipping fees are increased significantly for the haulers that currently have negotiated rates.

Minimum Operating Reserve Balance

Reserve balances for solid waste systems are set aside for specific cash flow requirements as well as for future project use, financial needs or legal coverage requirements. These funds are set aside to meet immediate financial needs but also provide the ability to minimize risk associated with meeting the financial obligations, capital needs and continued operations of the Utility. Many utilities, rating agencies and investment firms place a large emphasis on the need for an adequate reserve so the City's solid waste programs stay operational through unusual or adverse periods, unanticipated system failures, or natural disasters.

The City's stated financial policies require the various City funds to maintain a minimum fund balance in its operating fund equal to at least 18% of annual operations and maintenance (O&M) expenses. However, because the Fund is facing significant financial pressure, the City has waived this requirement during the projection period.

Future Borrowing Assumptions

Due to the City's utilization of General Obligation debt to finance solid waste capital projects, the Utility already has significant annual debt service requirements and the City is nearing its debt limit for future borrowing. Consequently, the Analysis assumes that all future capital projects will be cash funded.

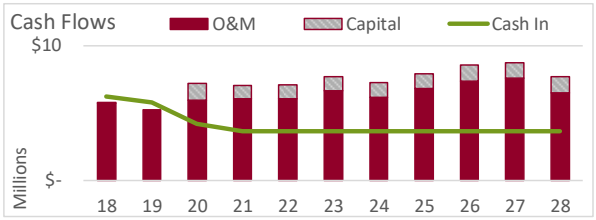
ANALYSIS AND RESULTS

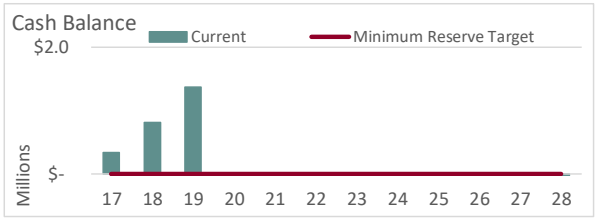
Based upon the data, assumptions, and policies presented herein, the City's current rates (waste collection fees and solid waste disposal fees) will not provide sufficient revenue to meet its ongoing debt service, capital, and operating cost requirements over a multi-year projection period. Further, the Utility is facing the need for significant increases in revenues to remain financially sustainable throughout the projection period. Table 3 below presents the baseline financial scenario with no adjustments.

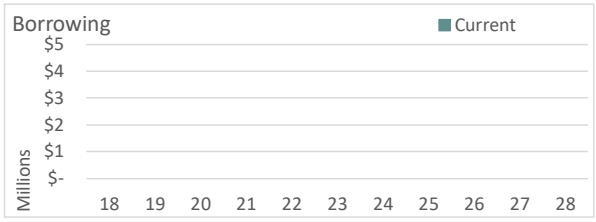
Table 3. Baseline Financial Scenario – No Rate Adjustments

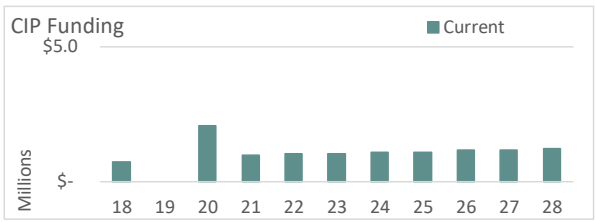
City of Bristol, VA
Solid Waste Revenue Sufficiency Analysis

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Revenue Adjustment $M	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Revenue Adjustment %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Residential Bill	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00	$22.00









Partially due to historical reluctance of the City Council to develop and implement a plan of annual rate adjustments to help the Utility keep pace with inflation and increases in operating costs, the City now needs significant annual rate adjustments in the near-term to remain solvent. To minimize the impact to the City's ratepayers, we considered 4 potential scenarios to ensure the long-term viability of the Utility: 1) increase rates and/or tipping fees, 2) reduce expenses, 3) close the City's quarry landfill, and 4) sell or privatize the landfill.

Each of these scenarios are discussed in greater detail in the following section.

4 ALTERNATIVE SCENARIO ANALYSIS

SCENARIO 1 - INCREASE RATES

The primary sources of revenue for the solid waste program are 1) residential collections fee revenue, and 2) commercial customer tipping fee revenue. The residential collections fee increased in FY 2016 from $13.00 to $18 per month and again in FY 2018 to $22.00. The average commercial customer tipping fee is in the range of $16.50 to $26.00 per ton, with an overall weighted average fee around $20.00. These assessments come at either contracted negotiated rates or at the ISWMF's "Gate Rate," which currently stands at $30 per ton for most materials. Note that currently the Collections Division reimburses the Disposal Division for the tipping of its collected material at the Gate Rate.

City staff expressed the concern that the commercial tipping fees assessed may leave very little room for increase due to alternate facilities nearby with comparable rates to their contracted rates with the ISWMF. Staff feels that a few of the contracted customers may be able to bear a $1 per ton increase at most, but asked SCS to quantify the potential tipping fee increases for each hauler based on a systematic methodology. An analysis was performed which took into account the geography of waste load source, the average waste load size, the current average tipping fees assessed, and the type of vehicle used to transport the waste to the ISWMF. These factors allowed a "Room to Run" calculation to be performed on the tipping fees by major customer, and for some customers, estimated elasticities of demand to be calculated. "Room to Run" results produced estimated economic break-even tipping fees for each customer which indicated that the averaged assessed per ton tipping fee could probably be raised several dollars without the risk of losing large quantities of waste throughput.

Analysis

One of the intents of this Analysis is to ensure that the revenue requirement for the City's ongoing financial sustainability is not just the burden of the City's Collections customers, but is also borne by the commercial haulers that benefit from the services provided by the City's ISWMF. This is possible by adjusting the City's current rates and fees, including collection customer rates, landfill tipping fees, and other assessments/user fees.

The primary sources of revenue for the solid waste program are 1) residential collections fee revenue, and 2) commercial customer tipping fee revenue. The residential collections fee increased in FY 2016 from $13.00 to $18 per month and again in FY 2018 to $22.00. The average commercial customer contracted tipping fee is in the range of $16.50 to $26.00 per ton, with an overall weighted average tipping fee of less than $20.00 per ton.

City staff expressed the concern that the commercial tipping fees assessed may have very little room for increase due to alternate facilities nearby with comparable rates to their contracted rates with the ISWMF. Staff feels that a few of the contracted customers may be able to bear a $1 per ton increase at most. SCS attempted to quantify the potential tipping fee increases for each hauler based on a systematic methodology. An analysis was performed which took into account the geography of waste load source, the average waste load size, the current average tipping fees assessed, and the type of vehicle used to transport the waste to the ISWMF. These factors allowed a "Room to Run" calculation to be performed on the tipping fees by major customer, and for some customers, estimated elasticities of demand to be calculated.

Findings

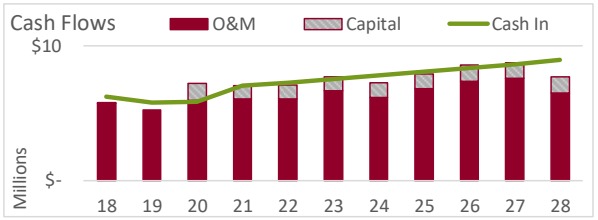
Based upon the data, assumptions, and analysis performed, the Utility's current rates (waste collection fees and solid waste disposal fees) will not provide sufficient revenue to meet its ongoing debt service, capital, and operating cost requirements over a multi-year projection period. Further, the Utility requires significant increases in revenues in FY 2020 and FY 2021 or 90% and 66%, respectively to maintain a positive fund balance during those years. Starting in FY 2022, the Utility will need to implement inflationary-like rate adjustments to ensure ongoing financial sustainability throughout the projection period and to prevent the future need for large rate adjustments.

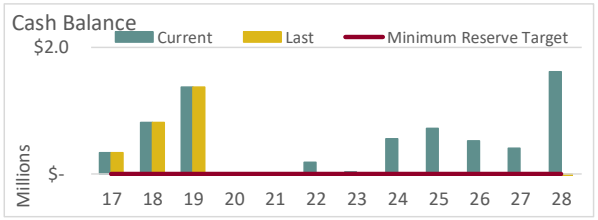
The 10-year plan of recommended rate adjustments along with the average residential bill is shown in **Table 4** below. Detailed schedules reflecting all of the data and assumptions used in this analysis is available in **Appendix A**.

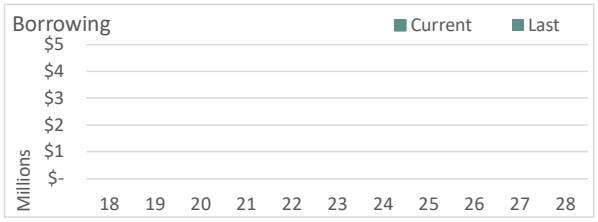
Table 4. Scenario 1 - Increase Rates

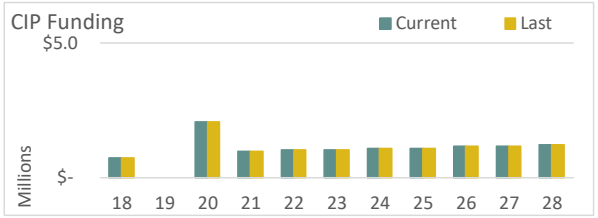
City of Bristol, VA
Solid Waste Revenue Sufficiency Analysis

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Revenue Adjustment $M	$0.00	$0.00	$1.32	$1.83	$0.14	$0.14	$0.15	$0.15	$0.15	$0.16	$0.16
Revenue Adjustment %	0.00%	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Last	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average Residential Bill	$22.00	$22.00	$41.80	$69.39	$71.47	$73.61	$75.82	$78.10	$80.44	$82.85	$85.34









SCENARIO 2 – REDUCE EXPENSES

An analysis of the potential of the City to reduce expenses in both its Collections and Disposal Divisions was conducted via a site visit and a background information/data review. This was conducted through an extensive review of City documents coupled with SCS's solid waste industry knowledge of solid waste facility operations and capital improvements.

Analysis

In addition to assessing opportunities for expense reductions, SCS benchmarked comparable programs to the Bristol Collections and Disposal operations using an internal database of other programs' costs. The analysis indicated that the City's costs of operations, when quantities of waste managed or disposed were considered, were already significantly lower than that of other programs.

Findings

Our findings indicated that a 100% cost-recovering expenditure reduction alternative does not appear feasible to the City while maintaining the current level of service provided. As shown in **Exhibit 2**, it appears likely that, in fact, that ISWMF will experience *increased* expenditures in the future given the depreciated assets currently in use at the facility.

Major Expense Reduction

The largest potential expense reduction is reducing the cost per ton landfilled, especially in regards to the high capital costs of the vertical quarry lining system. Three possible suggestions to decrease this cost follow:

- **"Pyramiding" Activities and "Lining in Arrears":** Landfill personnel reported the practice of "pyramiding," or filling the quarry cell waste lifts in arrears such that the middle of the cell floor during any particular filling plan pass is elevated into the airspace above the lined limits of the Quarry side wall. Two key issues contribute to the difficulties, and additional operational costs, associated with this practice:

    1. The management of Stormwater infiltrating the waste mass, including allowing for effective drainage, is made more challenging. This hinders effective and efficient operation of both light-duty and heavy equipment in the active cell.
    2. The sloped nature of the waste accelerates the depreciation of the compactor and bulldozer, increasing the frequency of maintenance and driving up fuel usage.

    Although currently not financially feasible, these factors be reduced through the injection of capital to end the practice of lining in arrears.

- **Pumping of Stormwater out of the Quarry Cell:** High liquid levels in the quarry cell have decreased landfill gas (LFG) production to very low levels. Lack of gas production indicates that the decomposition of organic material which normally occurs in landfills may be hindered by the high levels of liquid in the waste mass. Increasing liquid pumping, or investing in additional pumping infrastructure, may more than pay for itself due to the potential for revenue from the LFG agreement with Ingenco, which the City used to benefit from, and the size reduction of material due to decomposition, which would decrease the frequency of landfill lining required.

- **Landfill Lining Competitive Bid:** High levels of competition during procurement of a landfill lining contractor helps reduce the cost of the relatively-niche activity. This may be difficult given the specific nature of the 588 landfill's lining needs; however, it appears that there may be some opportunity to increase the competitiveness of the bidding by expanding the search via increasing advertising for the task to the national or even global level and/or partnering with a negotiator/broker which could help drive costs down further.

Miscellaneous Expense Reduction

- Review of the recycling collection and processing system seemed to indicate that any **savings from cutting recycling service offerings would likely be negligible** and would only accelerate the frequency of lining the Permit No. 588 landfill and reduce income from the sale of recyclables.

- Similarly, review of the organics collection and processing system seemed to indicate that any **savings from cutting mulching and composting would likely be negligible** and would only accelerate the frequency of lining due to the low level of biodegradable material decomposition occurring in the Permit No. 588 landfill and reduce income from the sale of mulch/compost. These practices also provide a "free" source of landscaping material for the City's other divisions such as Street Maintenance and Parks and Recreation.
- Since the disposal of certain materials by City Divisions other than Solid Waste (such as Streets or Parks and Recreation) affects the finances and operations of the ISWMF, and general fund monies are being used to fund the ISWMF, **a review of additional departments' finances and operations, especially in regards to their interactions with Solid Waste, may prove beneficial**, but fell outside the scope of this Analysis.

Miscellaneous Revenue Increase

- Although not a direct expenditure reduction per se, SCS recognizes the potential for increasing revenues **by increasing the assessed solid waste fee recovery rate**. Since approximately 95% of the operating revenues of the Collections Division comes from solid waste collection fees, an incremental increase in the percentage of assessed solid waste fees recovered could generate significant increases in revenue, even if it is only feasible by incurring the additional costs of enforcement
- Various infrastructure such as the transfer/baling building and various paved areas within the ISWMF appear underutilized. The City **could consider leasing its assets out to private enterprise** as an additional source of income.

SCENARIO 3 – CLOSE THE LANDFILL

This Analysis evaluated the financial impact on the Utility if the City were to close the active Quarry Landfill Cell (prior to achieving full design capacity) and introduce alternative options for handling solid waste generated within the City. This alternative did not consider cessation/termination of additional solid waste programs and facilities such collections, recycling, and organics processing operations.

If the City were to close the Quarry Landfill Cell, the Utility would incur increased disposal costs to haul and dispose of the City's solid waste at another disposal facility. Further, if the City does not transfer the ownership of the facility and, instead, enters into an agreement with an operator who will run the facility, the City could still face future liability for the closure and post-closure costs of the landfill.

Analysis

SCS examined the closure costs prepared by the City's engineer, Draper Aden Associates (DAA) for purposes of financial assurance, and results were as follows:

- **DAA Estimate**:
  - Total Closure Cost $7.6 million
  - Total Post-Closure Care Cost $5.1 million

  Overall DAA Total: $12.7 million (Adjusted for inflation in 2018)

- **SCS Estimate**
  - Total Closure Cost $7.2 million
  - Total Post-Closure Care Cost $6.9 million

Overall SCS Total: $14.1 million (Adjusted for inflation in 2018)

SCS's closure estimate was slightly less than DAA's, but our post-closure care cost was significantly higher (35%) due to additional assumed stormwater management infrastructure costs and increased quantity of leachate generated; DAA used 7.3 million gallons per year, assuming 10% of FY 2018 flows. SCS assumed 25% of FY 2018 flows, or 18.2 million gallons per year, to account for more uncertainty in future high-precipitation weather patterns and in closing a landfill, especially one that essentially serves as a giant catchment basin, before its final grades are achieved.

Under a closure scenario, the Bristol Landfill would no longer compete with Advanced Disposal at its Blountville facility, so tipping fees would be expected to rise from the average tipping fee per ton currently charged at both facilities. This would significantly impact the city, which hauled over 35,000 tons of material to the ISWMF from both public and private haulers and from residential, commercial, and institutional sources. A $10 per ton increase would cost the City about $365,000 in additional disposal costs each year.

Findings

Closing the landfill seems the most unlikely of any scenario, simply because the City would still be on the hook for the $18 million+ in ISWMF's environmental liabilities (as well as the provision of solid waste collection and disposal for its citizen's) but would cease control over the disposal facility for its collections program and any opportunity for deriving revenue from material disposal/processing.

It should be noted that under this scenario, the City is equipped with an operational transfer station should it choose to export waste to an alternative disposal facility. This eliminates the high degree of risk and uncertainty associated with siting, designing, permitting, and operating an as-of-yet non-existent transfer facility.

SCENARIO 4 – SELL OR PRIVATIZE THE ENTERPRISE

The City is considering options to sell certain solid waste facility assets (most notably the active Quarry Landfill Cell and associated infrastructure/auxiliary facilities). As way of testing potential scenarios related to this scenario, an enterprise valuation model was developed specifically to estimate the Net Present Value (NPV) and other financial metrics of the City's solid waste program based on future projected cash flows which take into account current revenues, operational costs, and capital costs.

The City is also considering options to enter into a public-private partnership where certain programs and/or facilities such as landfill operations would be operated by a third-party private contractor while continuing to serve in conjunction with the City to meet its solid waste management needs.

As way of testing potential sale scenarios, an enterprise valuation model was developed specifically to estimate the Net Present Value (NPV) and other financial metrics of the City's solid waste program based on future projected cash flows which take into account current revenues, operational costs, and capital costs. Since the model does not incorporate financial expenses such as interest payments and transactional costs incurred by the City of Bristol in financing its solid waste operations, it assesses the economic outlook if ownership of certain activities and facilities was transferred to a private entity. It estimates the potential sale price of the two separate divisions (disposal and collections) on both an individual and combined basis. Due to the model's complex and uncertain nature, the three possible sale options also included low, medium, and high estimated

valuation situations for a total of nine independent results**. The medium, or most likely scenario, is presented for purposes of this report**.

The Enterprise Valuation Model proved highly sensitive to the choice of inputs. The Medium, or "Most Likely" scenario was assumed to be the most accurate given the context and results of the modeling effort. Financial metrics were as follows for this scenario (Note that this is a "best guess" and that there is a very high degree of uncertainty associated with these results):

- **Disposal Only (ISWMF):** NPV was approximately $120K. This is in line with the $350K amount for which several locality-owned landfills in Virginia were sold within the past decade to Container First Services, a private equity firm which purchased the Lunenburg County Landfill and Tri-Cities Landfill in Petersburg and was subsequently bought out by the larger Meridian Waste.
- **Collections Only**: NPV was approximately $7.6 million. The collections operations are regarded as financially successful within City leadership and make up the bulk of the value solid waste services provided by the City as calculated by the model.
- **Whole Enterprise (Disposal + Collections)**: NPV was approximately $10 million. This represents the combined purchase price of the Disposal and Collections divisions. This figure is higher than the combined total of the former two bullet points due to synergistic efficiencies built into the model under the whole enterprise scenario.

Analysis

Development of the Enterprise Valuation Model made up the bulk of the analysis associated with this scenario. Since the model does not incorporate financial expenses such as interest payments and flotation costs incurred by the City of Bristol in financing its solid waste operations, it assesses the economic outlook if ownership of certain activities and facilities was transferred to a private entity. It estimates the potential sale price of the two separate divisions (disposal and collections) on both an individual and combined (whole solid waste enterprise, which takes into account inter-division synergies) basis.

Due to the model's complex and uncertain nature, the NPV was calculated using varying assumptions which resulted in three possible sale situations corresponding to low, medium, and high estimated valuation scenarios**. The medium, or most likely scenario, is presented for purposes of this report**. An Internal Rate of Return (IRR) and Average Annual Cash Flow (AACF) was also calculated each time the NPV was calculated. Some key overall input assumptions made within the enterprise valuation model include:

- Rev Growth Rate Factor (RGRF): 2.3%
- Cost Growth Rate Factor (CGRF): 1.8%
- Waste Growth Rate Factor (WGRF): 0.5%
- Inflation Factor: 1.5%

The model results **indicated that the Landfill could be sold for a net positive return only if it was purchased by the owner of nearby Blountville's Eco Safe Landfill, Advanced Disposal**, allowing the private company to raise tipping rates accordingly. Key considerations in assessing the potential viability of this scenario, presented for the three possible sale options explored, include the following:

Collections Division Sale

- **Government Status.** The City provides solid waste (weekly MSW and bulky waste) and organics (leaves, grass trimmings, and other yard waste) collections for all its residents. The current rate is $22.00 every month. This rate does not appear to be too far out of line with that charged by other localities in the greater region, but may be on the high side for municipal collections programs benefiting from a local landfill facility. The results of our collection fee benchmarking effort are presented in **Appendix C**.
- **Capital Assets.** The value of the City's capital assets, which includes automated collection vehicles, was not considered in the sale analysis. Future projected cash flows extrapolating current revenues, operational costs, and capital costs accounted for capital replacements based off available information.
- **Flow Control**. Other than obligatory resident participation in its collection's program, the City does not benefit from "flow control," or a local government's mandate for all of a particular material such as commercially-generated MSW, to be delivered to a particular disposal or processing facility. This has been implemented in other localities in Virginia, and has a basis in Code of Virginia § 15.2-931 when economically necessary, although SCS cannot comment on the legal viability of flow control. Still, it is worth exploring some of the potential financial benefits that could be incurred via flow control for the solid waste program.

Disposal Division Sale

- **Market Competitiveness:** The ISWMF competes against other disposal facilities for revenue from the large quantities of material, primarily MSW and CDD, assessed tipping fees either at predetermined contracted rates or ad-hoc gate-rate sales. Southwest Virginia and the surrounding area is a particularly competitive disposal market, with the City's primary competitor being the Eco Safe Landfill, owned by Advanced Disposal and located only 10 miles south of the City along I-81. This competition has resulted in rock-bottom average tipping fees assessed at the ISWMF for customers with the ability to negotiate for disposal with the two facilities; tipping fees paid by such customers are estimated to average approximately $17.50 per ton. This rate does not appear to sufficiently offset the cost of ISWMF operations and is out of line with that charged by facilities in the greater region and elsewhere as shown in the tipping fee benchmarking effort's results presented in **Appendix C**. The landfill, being located less than 20 (one-way) driving minutes from the ISWMF, also is assumed to attract qualified labor in a niche industry, potentially inflating personnel compensation.

  Other regional disposal competitors in the waste industry, including Waste Industries and Republic Services, would likely be reluctant to support Advanced Disposal's business in the event it purchased the ISWMF. For purposes of the modeling effort (which assumes Advanced is the facility purchaser), half of the waste currently projected from these haulers to be disposed in the ISWMF is assumed to be lost.

- **Loss of Major Customers:** Select customers, several of which are among the largest disposers at the ISWMF by quantity, are equipped with waste consolidation, compaction, and transfer infrastructure. They bring their waste loads to the landfill on 18-wheeler trailers which can accommodate up to (approximately) 21 tons of material. These customers seem most at risk of being lost with each marginal tipping fee increase, hence it is important to take into account their capability to take their waste to an alternative facility under various scenarios. In the enterprise valuation model, these major customers' disposed waste is

retained, but the risk of their transport ability and flexibility is accounted for by raising their rates to a lesser degree than other customers.

- **Landfill Vertical Lining Expense:** The most burdensome cost to the ISWMF, according to landfill personnel, is the capital lining expense associated with constructing the vertical liner and drainage system for the Quarry Cell configuration. This type of landfill, perhaps the first of its kind to be constructed nationally, is unique in the Commonwealth and requires fairly specialized installation (at a relatively-high frequency) that comes at a high price per ton of material landfilled. Using City-provided data, SCS calculated the marginal cost of procuring and installing the vertical lining system alone at about $4 per ton adjusted to 2018 dollars. The lining occurs approximately every 3 years or so, and last occurred in FY 2017. The capital expense of $1.5-$2 million per liner construction event has proved so burdensome in the context of the solid waste Enterprise and City finances, that it is currently performed in arrears through the practice of "pyramiding."

- **Environmental Liabilities:** Various depreciated or unused infrastructural relics associated with auxiliary materials management operations conducted at the ISWMF, in addition to those associated with major operations, have significant environmental liabilities "on the books" (so to speak) which could incur high capital expenses in the future. For the permit nos. 498 and 588 landfills, these liabilities are very high relative to the ISWMF's annual revenue and include the high cost of capping and post closure care (PCC) associated with closure and the 30+ years of facility upkeep after closure. The minor facilities include infrastructure such as the transfer station and baling building, tire processing facility, and composting area).

  The closure and post closure liabilities are listed below. Note that **these costs are estimates only and the uncertainty associated with them may be one of the biggest deterrents to a private buyer purchasing the landfill.** The following costs, which are derived from financial assurance estimates made by the City's landfill engineer, are built into the enterprise valuation model and were inflated over time accordingly:

  - LF Permit No. 588 Closure in FY 51 (estimated timeframe): $7,599,438 (FY18 dollars) closure costs escalated to be $13,952,704 in FY 51. $170K annual PCC costs, escalated to be about $305K starting FY 51. Actual closure year and costs will vary based on actual waste quantities disposed, waste composition, compaction operations, cell dewatering efforts, LFG production, and other factors.
  - LF Permit No. 498 Closure in FY 22: $4,165,273 (FY18 dollars) closure costs escalated to be $4,540,344 in FY 22. This includes $1,000,000 in possible environmental remediation costs from potentially contaminated soil under LF No. 498, the actual extent of which will not be known until closure activities begin (including the existence of any necessary environmental remediation at all). $64K annual PCC costs, escalated to be about $67K starting FY 22. Actual closure year and costs will vary based on facility operations as well as regulator activity.
  - Other Closure Costs incurred FY 23: Assumed to be about $73K, which is about 1/3 the engineer's combined Financial Assurance estimate for the Transfer Station, Tire Processing Facility, and Composting Facility combined. This assumption captures some of the temporally uncertain risk associated with these facilities.

- **Capital Reserves and Unexpected Potential Major Costs:** CIP items through FY 21 were incorporated as actually planned as of the date of this Report and $100K for landfill

operations and $100K for collections operations per year (escalated in future years) were assumed to account for funding of a reserve for capital projects. In addition, SCS's site visit and subsequent conversation with landfill personnel led to the decision that significant capital expenses other than the landfill capping/lining could possibly be incurred in the short to mid-term. Accordingly, an expense with a present value of $2,000,000 to account for large-scale infrastructure replacements/repairs was projected for FY 23.

- **Masterplanning and Alternate Facility Use:** The financial and economic projections of this enterprise valuation model do not take into account potential alternate facility uses that would require long-term masterplanning and/or complex economic/political decision making. For example, the lining and life of landfill projections are based off business as usual closure configurations; there could potentially be increased returns by expanding the 588 landfill to merge or "piggyback" off the 498 landfill to create a combined hill that could benefit from increased economies of scale and a higher volume-to-surface-area-ratio compare to the current configuration. In the long term, potential expansion of composting/yard waste processing operations, revitalization of the transfer station/balers, increased utilization of the LFG-to-energy power plant, reopening of the tire processing facility, refurbishment of the old wood incineration plant, and overall use of other site assets were not fully explored as a part of this analysis.

Whole Enterprise Sale

- **Division Synergies:** The Disposal Division and the Collections Division benefit mutually from each other's operations due to shared assets and other synergistic operations, such as sharing a maintenance/fleet storage area and certain personnel. These synergies were accounted for in the model via building them into future Collections operations expenses and subtracting this amount from the Whole Enterprise results.

Results

As shown in **Table 5** below, the calculated NPV represents an enterprise purchase price with a weighted average cost of capital (WACC) of 6.3%, which includes inflation. For purposes of calculating IRR, values of $350,000 for the landfill and $5 million for collections (the sum of the two for both) were assumed to be paid in Year Zero for those enterprise components; note the landfill sale amount differs from the NPV amount slightly. Annual cash flow (ACF) was also calculated.

Table 5. Enterprise Valuation Model Calculated Financial Metrics

Situation	Financial Metric	Worst	Medium	Best
Disposal	IRR	NA	6.39%	287.90%
	Avg ACF	-$3,385,793	-$2,479,999	-$1,827,349
	NPV	-$24,284,696	$122,349	$18,385,687
Collections	IRR	7.76%	8.38%	9.07%
	Avg ACF	$765,908	$953,840	$1,206,191
	NPV	$6,702,191	$7,640,456	$8,870,865
Whole Enterprise	IRR	NA	13.52%	33.72%
	Avg ACF	-$2,416,439	-$1,317,733	-$412,732
	NPV	-$15,309,092	$10,062,390	$29,556,136

Although privatization might yield modest net revenue for the City under the right outsourcing agreement due to private enterprise's access to relatively-inexpensive capital (and other factors), it seems unlikely to significantly increase the ISWMF's economic position in its competitive market. Under this scenario, if a private operator took on the outsourcing task even after some sort of revenue sharing agreement with the City was formulated, two factors could decrease the inherent financial efficiency of the operation:

- **Taxation:** A private operator would incur state and federal tax liabilities on various aspects of its business to which the City is not currently subject, which would hinder the ability to provide the services at the ISWMF at a lower cost. The cost of taxation would possibly be passed along to the ISWMF's current customers, which includes the City's residents, businesses, and institutions. Note some property taxes might go back to the City under this arrangement, notwithstanding some sort of negotiated tax incentive deal.
- **Profitability**: A private company operating the ISWMF would still have to generate income to compensate its ownership. Since the City is a non-profit entity, this is not a consideration in the current arrangement. At least a portion of the profits achieved would possibly be passed along to the ISWMF's current customers, which includes the City's residents, businesses, and institutions.

Findings

Under a privatization or operations outsourcing scenario, the City would have to benefit financially despite the fact that a private operator would have the additional cost of taxation as well as the requirement to profit. Given how lean current operations appear to be, this seems unlikely. The Analysis supported that privatizing the Landfill would not be a viable scenario, and therefore it was not modeled.

In addition, selling the Collections Division (or Whole Enterprise, Disposal *and* Collections) was deemed not viable because the City must keep its primary source of income (the Collections Division) to pay down its ongoing debt service requirements. Although the City would have to find a buyer, selling the Landfill was found to potentially be a viable scenario and thus was modeled.

Based upon the data, assumptions, and analysis performed, the Utility's current rates (waste collection fees and solid waste disposal fees) will not provide sufficient revenue to meet its ongoing debt service, capital, and operating cost requirements over a multi-year projection period even under a landfill sale scenario. Under such a scenario, the only capital costs for the Utility are assumed to be cart replacements, and the Analysis assumes that the Utility would not have to pay tipping fees to the purchaser/private entity during the projection period. However, the Utility is still responsible for over $2 million per year in debt service, so significant rate adjustments are still necessary. The Utility, in this scenario, requires 30% rate revenue adjustments FY 2020 and FY 2021 to maintain a positive fund balance during those years. Starting in FY 2022, the Utility will need to implement inflationary-like rate adjustments to ensure ongoing financial sustainability throughout the projection period and to prevent the future need for large rate adjustments. For simplicity a Landfill sale price of zero dollars was used, since the enterprise valuation model "middle" situation result was relatively small.

The 10-year schedule of recommended rate adjustments under a landfill sale scenario is shown in **Table 6** below. Detailed schedules reflecting all of the data and assumptions used in this analysis is available in **Appendix B**. Note this scenario assumes ongoing ISWMF liabilities (but not solid waste related debts) are transferred to the buyer.

5 OVERALL CONCLUSIONS/RECOMMENDATIONS

Overall conclusions and/or recommendations are as follows:

1. **The City is approaching its debt ceiling**, which is largely attributable to ISWMF borrowing. Despite this, the City still has large financial obligations related to the ISWMF on the immediate horizon and no alternative means to raise the capital. The most notable and pressing obligation is the closure and capping of the Permit No. 498 landfill, estimated to cost just under $5.2 million by the City's engineer. $1 million of this figure is variable in either direction or may not need to be incurred at all; it is attributed to the possibility for required environmental remediation which will only be discoverable once closure activities begin. The Virginia Department of Environmental Quality (VDEQ) mandates the 498 landfill be closed by FY 2022. In addition, closure of the active Permit No. 588 landfill (which is presently not expected to occur for many decades) is estimated to cost $7.6 million.
2. **The ISWMF's ongoing annual debt service obligations are over $2 million annually** and will remain as such almost through the end of the next decade. Based on our background review and observations at the ISWMF, these costs, while not necessarily indicative of an operationally unstainable current program, show that large injections of outside capital (primarily in the form of general fund monies and bonds) over the landfill's life were insufficient to fund replacement of ISWMF equipment and infrastructure, let alone reserves for equipment replacement or the aforementioned major landfill closure obligations such as closure care (CC) and post-closure care (PCC).
3. **The active Permit No. 588 quarry landfill incurs high lining costs due to its vertical nature.** These costs were calculated at an average of about $4 per ton of material disposed in the quarry cell incurred as a $2.5 million project about every three years. Note these costs do not include initial Quarry Landfill development costs nor an approximately $10 million investment associated with rebuilding the entrance road/ramp in 2010. On a national level, there are limited landfill facilities built into converted quarries to compare cell construction costs to for benchmarking purposes, but it is apparent that the vertical format of the lining operations makes quarry landfilling, or at least serpentine-shaped quarry landfilling, more costly than traditional landfilling.
4. **Tipping fees charged to haulers do not reflect the actual cost of waste disposal.** The calculated cost of disposal per ton of landfilled material hovers in the vicinity of $34 to $40 per ton. Despite this, the unit tipping fees assessed at the ISWMF to private and public outside haulers vary from about $16 per ton to $22 per ton. Therefore, for many customers, the City is losing somewhere in the ballpark of $12 to $24 per ton of material it accepts. In essence, City taxpayers and collections program customers have been and continue to subsidize the disposal of waste by private businesses and localities located outside of the City.
5. **The City should consider implementing flow control within its jurisdiction:** Due to the competitive nature of landfilling in the region, one potential avenue for the City that will decrease or partially nullify the relatively-high elasticity of demand of the ISWMF's tipping fees is instilling flow control, or a local government's mandate for all of a particular material such as commercially-generated MSW, to be delivered to a particular disposal or processing facility. Flow control is defined by the US Environmental Protection Agency (US EPA) as a political legal provisions that allow state and local governments to designate the places where MSW is taken for processing, treatment, or disposal. US EPA issued a fact sheet that indicates flow controls are an administratively efficient tool for local governments to plan and fund solid waste management systems.

Other than obligatory resident participation in its collection's program, the City does not currently benefit from a flow control ordinance because no such ordinance exists. This has been implemented in other localities in Virginia when economically necessary, though the legal viability for the City's case would have to be more thoroughly investigated.

The Commonwealth's section of administrative code allowing localities to implement solid waste flow control (with restrictions) is VC § 15.2-931 - Regulation of garbage and refuse pickup and disposal services; contracting for such services in certain localities. The section requires several findings be met including:

- That other waste disposal facilities, including privately owned facilities and regional facilities, are: (i) unavailable; (ii) inadequate; (iii) unreliable; or (iv) not economically feasible, to meet the current and anticipated needs of the locality for waste disposal capacity; and
- That the ordinance is necessary to ensure the availability of adequate financing for the construction, expansion or closing of the locality's facilities, and the costs incidental or related thereto.
- Prior to the adoption of any flow control ordinance, the locality must ensure there is adequate space available to accept all of the locality's refuse at its landfill.

The section also limits the application of flow control measures such that haulers cannot be prevented from taking waste to a facility outside of the locality if the facility was issued a solid waste permit by an agency of the Commonwealth on or before July 1, 1991 or was issued a Part A permit application for a new solid waste management facility permit, including local governing body certification, submitted to the Department of Waste Management in accordance with VC § 10.1-1408.1 B on or before December 31, 1991.

At least one solid waste authority in Virginia has implemented flow control as a means to continue sustainable operations of its landfill: the Rappahannock Regional Waste Management Board, or R-Board, made up of the City of Fredericksburg and Stafford County under the Virginia Water and Waste Authorities Act (Chapter 51, Title 15.2 of the Code of Virginia (1950), as amended). The flow control measures were implemented along with several other program changes in order to turn around the financial condition of the R-Board Landfill located in Stafford, Virginia. The measures, combined with other factors, helped the program maintain financial and political viability.

6. **The City should consider a regional partnership:** Partnering with other regional localities to form a solid waste authority or other partnership could have benefits including the alleviation of risk to the City while simultaneously making more secure the disposal future of potential partner localities. Having buy-in to the landfill's development and operation could provide injections of capital potentially needed by the City, which is approaching its debt ceiling. Potential partners would be more in control of their destinies in regards to solid waste, and less subject to changes in tipping rates at landfills within their service areas.

Appendix A

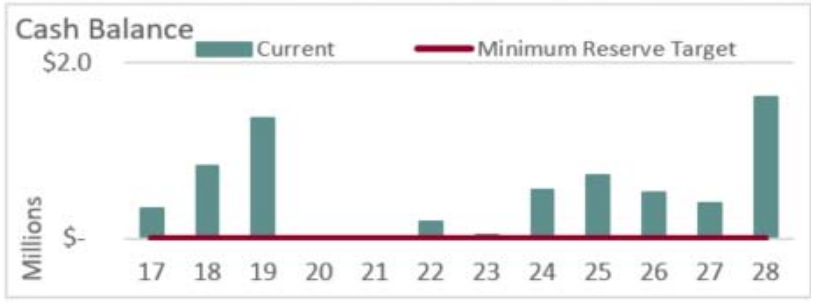
Schedules of Model Data and Assumptions

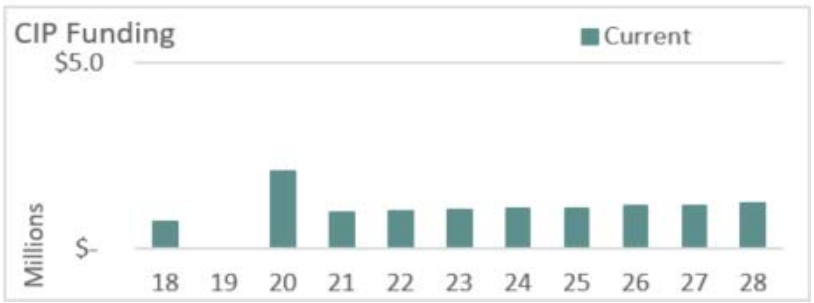
– Keep Landfill

Schedule 1 - Model Results

City of Bristol, VA
Solid Waste Revenue Sufficiency Analysis

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Revenue Adjustment $M	$0.00	$0.00	$1.32	$1.83	$0.14	$0.14	$0.15	$0.15	$0.15	$0.16	$0.16
Revenue Adjustment %	0.00%	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Average Residential Bill	$22.00	$22.00	$41.80	$69.39	$71.47	$73.61	$75.82	$78.10	$80.44	$82.85	$85.34





Schedule 2 - Model Assumptions & Inputs

Assessed Units

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Account Growth											
Total Accounts	7,108	7,100	7,092	7,084	7,076	7,068	7,060	7,052	7,044	7,036	7,028
Change in Accounts		(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
% Change in Accounts		-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%

Spending Execution Assumptions

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Personal Services	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fixed Operations & Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Variable Operations & Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Capital Outlay	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Cost Escalation Factors

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Salaries	N/A	N/A	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
O&M	N/A	N/A	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
R&M	N/A	N/A	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Fuel	N/A	N/A	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Insurance	N/A	N/A	7.00%	6.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
CO	N/A	N/A	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
No Escalation	N/A	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Interest Assumptions

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Interest Earnings on Fund Balances	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Working Capital Reserve Target

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Percent of Annual O&M Expense	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Schedule 3 - Trial Balances as of 6/30/2017

		Solid Waste Fund	Capital Projects Fund	Post-Closure Reserve
Restriction		**Unrestricted**	**-**	**Other**
Assets				
Cash and Cash Equivalents	$	783,561	1,204,630	-
Accounts Receivable, Net of Allowance fo		317,697	-	-
Due from governmental Units		121,716	-	-
Prepaid Items		12,090	-	-
Total Assets	**$**	**1,235,064**	**1,204,630**	**-**
Liabilities				
Accounts Payable	$	(801,934)	-	-
Compensated Absences - current portion		(92,806)	-	-
Total Liabilities	**$**	**(894,740)**	**-**	**-**
Total Available Fund Balance	**$**	**340,324**	**1,204,630**	**-**

Schedule 4 - Cash In

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Rate Revenue Assumptions												
Rate Adjustment		0.00%	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Rate Revenues	**Codes**											
Solid Waste												
Solid Waste Rate Revenue	100100001	$ 1,466,000	1,464,367	2,779,163	4,608,206	4,741,092	4,877,804	5,018,451	5,163,148	5,312,009	5,465,155	5,622,710
Total Rate Revenues		**$ 1,466,000**	**1,464,367**	**2,779,163**	**4,608,206**	**4,741,092**	**4,877,804**	**5,018,451**	**5,163,148**	**5,312,009**	**5,465,155**	**5,622,710**
Other Operating Revenues												
Solid Waste - Disposal Fees	1000000001	$ 3,223,915	3,112,245	2,300,410	1,690,257	1,804,845	1,922,884	2,044,385	2,169,585	2,298,536	2,431,344	2,568,151
Recycling Income	1000000002	40,000	44,000	44,000	44,000	44,000	44,000	44,000	44,000	44,000	44,000	44,000
Mulch/Compost	1000000004	55,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Dumpster Permit Fee	100100003	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Total Other Operating Revenues		**$ 3,368,915**	**3,246,245**	**2,434,410**	**1,824,257**	**1,938,845**	**2,056,884**	**2,178,385**	**2,303,585**	**2,432,536**	**2,565,344**	**2,702,151**
Transfers In												
Transfer from General Fund	200000004	$ 1,386,680	1,107,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480
Total Transfers In		**$ 1,386,680**	**1,107,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**
Total Cash In		**$ 6,221,595**	**5,818,092**	**5,821,053**	**7,039,943**	**7,287,417**	**7,542,167**	**7,804,316**	**8,074,212**	**8,352,025**	**8,637,979**	**8,932,340**

Schedule 5 - Cash Out

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Personal Services	**Codes**											
Salaries & Wages - Regular	110101180	$ 559,624	520,587	541,410	563,067	585,590	609,013	633,374	658,709	685,057	712,459	740,958
Salaries & Wages - Overtime	110101280	35,000	29,855	31,049	32,291	33,583	34,926	36,323	37,776	39,287	40,859	42,493
Salaries & Wages - Overtime-Special	110101281	1,000	1,000	1,040	1,082	1,125	1,170	1,217	1,265	1,316	1,369	1,423
FICA	110102100	45,871	42,222	43,911	45,667	47,494	49,394	51,370	53,424	55,561	57,784	60,095
VRS Retirement	110102210	76,924	81,841	85,115	88,519	92,060	95,742	99,572	103,555	107,697	112,005	116,485
Hospitalization Insurance	110102310	111,772	111,772	119,596	126,772	133,110	139,766	146,754	154,092	161,797	169,886	178,381
VRS Life Insurance	110102400	7,001	6,436	6,887	7,300	7,665	8,048	8,450	8,873	9,316	9,782	10,271
VRS Disability Insurance	110102450	889	1,046	1,119	1,186	1,246	1,308	1,373	1,442	1,514	1,590	1,669
Unemployment	110102600	1,075	1,075	1,118	1,163	1,209	1,258	1,308	1,360	1,415	1,471	1,530
Worker's Compensation	110102710	24,327	24,327	25,300	26,312	27,365	28,459	29,598	30,781	32,013	33,293	34,625
Salaries & Wages - Regular	120201180	378,018	322,256	335,146	348,552	362,494	376,994	392,074	407,757	424,067	441,030	458,671
Salaries & Wages - Overtime	120201280	9,000	5,809	6,041	6,283	6,534	6,796	7,068	7,350	7,644	7,950	8,268
Salaries & Wages - Overtime-Special	120201281	3,000	3,000	3,120	3,245	3,375	3,510	3,650	3,796	3,948	4,106	4,270
FICA	120202100	29,837	25,363	26,378	27,433	28,530	29,671	30,858	32,092	33,376	34,711	36,099
VRS Retirement	120202210	57,345	53,256	55,386	57,602	59,906	62,302	64,794	67,386	70,081	72,885	75,800
Hospital Insurance	120202310	82,729	82,729	88,520	93,831	98,523	103,449	108,621	114,052	119,755	125,743	132,030
VRS Life Insurance	120202400	4,952	4,184	4,477	4,745	4,983	5,232	5,494	5,768	6,057	6,359	6,677
VRS Disability Insurance	120202450	170	204	218	231	243	255	268	281	295	310	326
Unemployment	120202600	683	683	710	739	768	799	831	864	899	935	972
Worker's Compensation	120202710	20,768	20,768	21,599	22,463	23,361	24,296	25,267	26,278	27,329	28,422	29,559
Subtotal Personal Services		**$ 1,449,985**	**1,338,413**	**1,398,141**	**1,458,483**	**1,519,163**	**1,582,387**	**1,648,263**	**1,716,903**	**1,788,424**	**1,862,948**	**1,940,603**
Personal Services Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Personal Services		**$ 1,449,985**	**1,338,413**	**1,398,141**	**1,458,483**	**1,519,163**	**1,582,387**	**1,648,263**	**1,716,903**	**1,788,424**	**1,862,948**	**1,940,603**
Fixed Operations & Maintenance												
Contract Labor	120103135	$ 40,000	40,000	41,600	43,264	44,995	46,794	48,666	50,613	52,637	54,743	56,932
Professional Services	120103140	190,000	190,000	195,700	201,571	207,618	213,847	220,262	226,870	233,676	240,686	247,907
Recycle Expenses	120103145	100,000	100,000	103,000	106,090	109,273	112,551	115,927	119,405	122,987	126,677	130,477
Maintenance of Building & Property	120103310	35,000	35,000	36,050	37,132	38,245	39,393	40,575	41,792	43,046	44,337	45,667
Maintenance of Machinery & Equip.	120103320	35,000	35,000	36,050	37,132	38,245	39,393	40,575	41,792	43,046	44,337	45,667
Advertising	120103600	3,000	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914
Utilities	120105100	393,600	393,600	405,408	417,570	430,097	443,000	456,290	469,979	484,078	498,601	513,559
Communications	120105230	8,200	8,200	8,446	8,699	8,960	9,229	9,506	9,791	10,085	10,388	10,699
Lease/Rent of Equipment	120105410	341,400	293,179	301,974	311,034	320,365	329,976	339,875	350,071	360,573	371,390	382,532
Travel Expense	120105530	2,000	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610
Education & Training	120105540	3,000	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914
Dues, Memberships & Subscriptions	120105810	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Printing & Office Supplies	120106001	1,500	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610
Housekeeping Supplies	120106005	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Material - Building & Property	120106007	140,000	140,000	144,200	148,526	152,982	157,571	162,298	167,167	172,182	177,348	182,668
Motor Fuel & Lubricants	120106008	175,000	175,000	178,500	182,070	185,711	189,426	193,214	197,078	201,020	205,040	209,141

Repair Parts - Equipment	120106009	77,000	77,000	79,310	81,689	84,140	86,664	89,264	91,942	94,700	97,541	100,468
Clothing & Personal Supplies	120106011	3,000	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914
Operating Supplies & Materials	120106014	45,000	45,000	46,350	47,741	49,173	50,648	52,167	53,732	55,344	57,005	58,715
Operating Expense	120107001	40,000	40,000	41,200	42,436	43,709	45,020	46,371	47,762	49,195	50,671	52,191
Other Equipment	120108101	-	65,000	66,950	68,959	71,027	73,158	75,353	77,613	79,942	82,340	84,810
Contract Labor	120203135	10,000	10,000	10,400	10,816	11,249	11,699	12,167	12,653	13,159	13,686	14,233
Professional Services	120203140	27,000	27,000	27,810	28,644	29,504	30,389	31,300	32,239	33,207	34,203	35,229
Maintenance of Machinery & Equipment	120203320	30,000	30,000	30,900	31,827	32,782	33,765	34,778	35,822	36,896	38,003	39,143
Communications	120205230	2,000	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610
Lease/Rent of Equipment	120205410	127,505	120,452	124,066	127,788	131,621	135,570	139,637	143,826	148,141	152,585	157,163
Travel Expense	120205530	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Education & Training	120205540	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Printing & Office Supplies	120206001	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Motor Fuel & Lubricants	120206008	100,000	100,000	102,000	104,040	106,121	108,243	110,408	112,616	114,869	117,166	119,509
Repair Parts - Equipment	120206009	45,000	45,000	46,350	47,741	49,173	50,648	52,167	53,732	55,344	57,005	58,715
Clothing & Personal Supplies	120206011	2,500	2,500	2,575	2,652	2,732	2,814	2,898	2,985	3,075	3,167	3,262
Operating Supplies	120206014	10,000	11,000	11,330	11,670	12,020	12,381	12,752	13,135	13,529	13,934	14,353
Bank Service Expense	220109140	2,300	2,300	2,369	2,440	2,513	2,589	2,666	2,746	2,829	2,914	3,001
Subtotal Fixed Operations & Maintenance		**$ 1,998,505**	**2,009,731**	**2,067,773**	**2,127,521**	**2,189,026**	**2,252,341**	**2,317,520**	**2,384,618**	**2,453,692**	**2,524,802**	**2,598,008**
Fixed Operations & Maintenance Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Fixed Operations & Maintenance		**$ 1,998,505**	**2,009,731**	**2,067,773**	**2,127,521**	**2,189,026**	**2,252,341**	**2,317,520**	**2,384,618**	**2,453,692**	**2,524,802**	**2,598,008**

Capital Outlay

Other Improvements or Construction	120108112	$ -	60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706
Other Equipment	120208101	1,000	-	-	-	-	-	-	-	-	-	-
Subtotal Capital Outlay		**$ 1,000**	**60,000**	**61,200**	**62,424**	**63,672**	**64,946**	**66,245**	**67,570**	**68,921**	**70,300**	**71,706**
Capital Outlay Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Capital Outlay		**$ 1,000**	**60,000**	**61,200**	**62,424**	**63,672**	**64,946**	**66,245**	**67,570**	**68,921**	**70,300**	**71,706**

Debt Service

Senior Lien Debt												
Other Debt Service Costs	210109130	$ 1,500	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524
2007 Series A- 69%		141,795	-	-	-	-	-	-	-	-	-	-
2007 Series C- 86%		517,758	56,880	56,880	56,880	56,880	529,047	535,006	-	-	-	-
2010 Restructuring- 75%		449,733	193,575	193,575	193,575	193,575	193,575	193,575	1,211,756	1,651,688	1,710,469	-
2010 Go Bond		11,631	-	-	-	-	-	-	-	-	-	-
2012C AMT Series		39,719	39,719	392,819	370,450	266,397	253,906	-	-	-	-	-
2014- Go Bond- 63%		510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	966,979
2016A Bond AMT- 68%		359,741	360,261	359,977	360,249	359,717	359,741	-	-	-	-	-
2018 SWDF Refunding Bonds		-	584,508	661,707	661,707	661,707	661,707	661,707	661,707	661,707	661,707	661,707
Subtotal Senior Lien Debt		**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Total Debt Service		**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**

Transfers Out

Transfer to Capital Projects Fund		$ 240,000	112,000	-	-	-	-	-	-	-	-	-
Transfer to Post-Closure Reserves		-	-	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Total Transfers Out		**$ 240,000**	**112,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**

Cash Funded Capital

Cash-Funded CIP		$ 22,000	-	1,227,660	976,028	1,029,349	1,035,468	1,092,036	1,098,528	1,158,541	1,165,428	1,229,096
Total Cash Funded Capital		**22,000**	**-**	**1,227,660**	**976,028**	**1,029,349**	**1,035,468**	**1,092,036**	**1,098,528**	**1,158,541**	**1,165,428**	**1,229,096**
Total Cash Out		**$ 5,743,595**	**5,270,315**	**7,185,110**	**7,032,850**	**7,105,179**	**7,698,974**	**7,280,377**	**7,907,280**	**8,549,351**	**8,762,216**	**7,724,622**

Schedule 6 - Pro Forma

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Rate Increase	0.00%	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Rate Revenues											
Solid Waste Rate Revenue	$ 1,466,000	1,466,000	1,464,367	2,779,163	4,608,206	4,741,092	4,877,804	5,018,451	5,163,148	5,312,009	5,465,155
Revenue from Growth	-	(1,633)	(1,650)	(3,135)	(5,204)	(5,360)	(5,521)	(5,687)	(5,857)	(6,033)	(6,214)
Revenue Before Rate Increase	**$ 1,466,000**	**1,464,367**	**1,462,717**	**2,776,028**	**4,603,002**	**4,735,732**	**4,872,283**	**5,012,765**	**5,157,290**	**5,305,976**	**5,458,941**
Rate Increase	0.00%	0.00%	90.00%	66.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Revenue from Rate Increase	-	-	1,316,445	1,832,178	138,090	142,072	146,168	150,383	154,719	159,179	163,768
Total Solid Waste Rate Revenue	**$ 1,466,000**	**1,464,367**	**2,779,163**	**4,608,206**	**4,741,092**	**4,877,804**	**5,018,451**	**5,163,148**	**5,312,009**	**5,465,155**	**5,622,710**
Total Rate Revenues	**$ 1,466,000**	**1,464,367**	**2,779,163**	**4,608,206**	**4,741,092**	**4,877,804**	**5,018,451**	**5,163,148**	**5,312,009**	**5,465,155**	**5,622,710**
Plus: Other Operating Revenues	$ 1,466,000	1,464,367	2,779,163	4,608,206	4,741,092	4,877,804	5,018,451	5,163,148	5,312,009	5,465,155	5,622,710
Operating Income	**$ 2,932,000**	**2,928,734**	**5,558,326**	**9,216,413**	**9,482,184**	**9,755,608**	**10,036,902**	**10,326,295**	**10,624,018**	**10,930,311**	**11,245,419**
Less: Operating Expenses											
Personal Services	$ (1,449,985)	(1,338,413)	(1,398,141)	(1,458,483)	(1,519,163)	(1,582,387)	(1,648,263)	(1,716,903)	(1,788,424)	(1,862,948)	(1,940,603)
Fixed Operations & Maintenance	(1,998,505)	(2,009,731)	(2,067,773)	(2,127,521)	(2,189,026)	(2,252,341)	(2,317,520)	(2,384,618)	(2,453,692)	(2,524,802)	(2,598,008)
Variable Operations & Maintenance	-	-	-	-	-	-	-	-	-	-	-
Total Operating Expenses	**$ (3,448,490)**	**(3,348,144)**	**(3,465,914)**	**(3,586,004)**	**(3,708,189)**	**(3,834,728)**	**(3,965,783)**	**(4,101,520)**	**(4,242,116)**	**(4,387,750)**	**(4,538,611)**
Net Operating Income	**$ (516,490)**	**(419,410)**	**2,092,413**	**5,630,409**	**5,773,995**	**5,920,879**	**6,071,120**	**6,224,775**	**6,381,902**	**6,542,561**	**6,706,808**
Plus (Less): Non-Operating Income in Debt Service Coverage Test											
Non-Operating Revenue	$ -	-	-	-	-	-	-	-	-	-	-
Transfers In	-	-	-	-	-	-	-	-	-	-	-
Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Capital Outlay	-	-	-	-	-	-	-	-	-	-	-
Transfers Out	-	-	-	-	-	-	-	-	-	-	-
Other Below the Line Expenses	-	-	-	-	-	-	-	-	-	-	-
Total Non-Operating	**$ -**	**(419,410)**	**2,092,413**	**5,630,409**	**5,773,995**	**5,920,879**	**6,071,120**	**6,224,775**	**6,381,902**	**6,542,561**	**6,706,808**
Net Income Before Debt Service	**$ (516,490)**	**(838,819)**	**4,184,825**	**11,260,818**	**11,547,990**	**11,841,759**	**12,142,240**	**12,449,549**	**12,763,804**	**13,085,121**	**13,413,617**

Debt Service & Coverage											
Existing Senior Lien Debt Service	$ 2,032,105	1,750,171	2,180,337	2,158,394	2,053,968	2,513,832	1,906,313	2,389,662	2,829,772	2,888,738	1,635,209
New Senior Lien Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Senior Lien Debt Service	**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Senior Lien Debt Service Coverage	0.68	0.78	0.80	1.32	1.45	1.23	1.69	1.41	1.24	1.26	2.32
Existing Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-
New Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Subordinate Debt Service	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subordinate Debt Service Coverage	-	-	-	-	-	-	-	-	-	-	-
Existing Short-Term Debt Service	-	-	-	-	-	-	-	-	-	-	-
New Short-Term Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Short-Term Debt Service	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Short-Term Debt Service Coverage	-	-	-	-	-	-	-	-	-	-	-
Total Debt Service	**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Net Income After Debt Service	**$ (645,680)**	**(387,703)**	**(432,677)**	**688,065**	**917,779**	**586,128**	**1,324,740**	**975,550**	**672,656**	**754,011**	**2,151,040**
Plus (Less): Non-Operating Income Not in Debt Service Coverage Test											
Non-Operating Revenue	$ -	-	-	-	-	-	-	-	-	-	-
Transfers In	1,386,680	1,107,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480
Payment of Debt Service with Non-Operating Reveni	-	-	-	-	-	-	-	-	-	-	-
Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Capital Outlay	(1,000)	(60,000)	(61,200)	(62,424)	(63,672)	(64,946)	(66,245)	(67,570)	(68,921)	(70,300)	(71,706)
Transfers Out	(240,000)	(112,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)
Other Below the Line Expenses	-	-	-	-	-	-	-	-	-	-	-
Total Non-Operating	**$ 1,145,680**	**935,480**	**296,280**	**295,056**	**293,808**	**292,534**	**291,235**	**289,910**	**288,559**	**287,180**	**285,774**
Net Cash Flow	**$ 500,000**	**547,777**	**(136,397)**	**983,121**	**1,211,587**	**878,662**	**1,615,976**	**1,265,460**	**961,215**	**1,041,192**	**2,436,814**
Fund Balance											
Balance at Beginning of Fiscal Year	$ 340,324	818,324	1,366,101	2,043	9,136	191,374	34,568	558,507	725,439	528,113	403,876
Net Cash Flow	500,000	547,777	(136,397)	983,121	1,211,587	878,662	1,615,976	1,265,460	961,215	1,041,192	2,436,814
Total Funds Available	**$ 840,324**	**1,366,101**	**1,229,703**	**985,164**	**1,220,723**	**1,070,036**	**1,650,544**	**1,823,967**	**1,686,654**	**1,569,305**	**2,840,691**
Less: Planned Cash Funded Capital	(22,000)	-	(1,227,660)	(976,028)	(1,029,349)	(1,035,468)	(1,092,036)	(1,098,528)	(1,158,541)	(1,165,428)	(1,229,096)
Balance of Working Capital	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**
Less: Working Capital Reserve Target	-	-	-	-	-	-	-	-	-	-	-
Surplus/Deficit of Working Capital	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**
Less: Additional Cash Funded Capital	-	-	-	-	-	-	-	-	-	-	-
Add Back: Working Capital Reserve	-	-	-	-	-	-	-	-	-	-	-
Balance at End of Fiscal Year	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**

Schedule 7 - Capital Improvement Plan

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Landfill Sidewall Liner	$ 701,630	-	2,000,000	670,000	670,000	670,000	670,000	670,000	670,000	670,000	670,000
Trash Cart Replacements	22,000	-	22,000	-	22,000	-	22,000	-	22,000	-	22,000
Unidentified Future Projects	-	-	-	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Total Projects	**$ 723,630**	**-**	**2,022,000**	**920,000**	**942,000**	**920,000**	**942,000**	**920,000**	**942,000**	**920,000**	**942,000**
Execution %	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Escalation %	100.0%	100.0%	103.0%	106.1%	109.3%	112.6%	115.9%	119.4%	123.0%	126.7%	130.5%
Total Executed Projects	**$ 723,630**	**-**	**2,082,660**	**976,028**	**1,029,349**	**1,035,468**	**1,092,036**	**1,098,528**	**1,158,541**	**1,165,428**	**1,229,096**

Schedule 8 - Borrowing

Senior Lien Borrowing

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Sources of Funds											
Par Amount	-	-	-	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds											
Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Cost of Issuance	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve	-	-	-	-	-	-	-	-	-	-	-
Other Costs	-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling											
Fiscal Years for Issuance	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$ -	-	-	-	-	-	-	-	-	-	-
Annual Payment	-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Subordinate Borrowing

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Sources of Funds											
Par Amount	-	-	-	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds											
Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Cost of Issuance	-	-	-	-	-	-	-	-	-	-	-

Debt Service Reserve		-	-	-	-	-	-	-	-	-	-	-
Other Costs		-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling												
Fiscal Years for Issuance		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$	-	-	-	-	-	-	-	-	-	-	-
Annual Payment		-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Short-Term Borrowing

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
Sources of Funds												
Par Amount		-	-	-	-	-	-	-	-	-	-	-
Other Sources		-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds												
Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
Cost of Issuance		-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve		-	-	-	-	-	-	-	-	-	-	-
Other Costs		-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling												
Fiscal Years for Issuance		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$	-	-	-	-	-	-	-	-	-	-	-
Annual Payment		-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Schedule 9 - Summary of Funds

Solid Waste Fund	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ 340,324	818,324	1,366,101	2,043	9,136	191,374	34,568	558,507	725,439	528,113	403,876
Cash In	6,221,595	5,818,092	5,821,053	7,039,943	7,287,417	7,542,167	7,804,316	8,074,212	8,352,025	8,637,979	8,932,340
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	(5,721,595)	(5,270,315)	(5,957,450)	(6,056,822)	(6,075,830)	(6,663,506)	(6,188,341)	(6,808,752)	(7,390,810)	(7,596,788)	(6,495,526)
Planned Cash Funded CIP	(22,000)	-	(1,227,660)	(976,028)	(1,029,349)	(1,035,468)	(1,092,036)	(1,098,528)	(1,158,541)	(1,165,428)	(1,229,096)
Subtotal	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**
Less: Amount Paid for Projects	-	-	-	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ 818,324**	**1,366,101**	**2,043**	**9,136**	**191,374**	**34,568**	**558,507**	**725,439**	**528,113**	**403,876**	**1,611,594**

Capital Projects Fund	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ 1,204,630	743,000	855,000	-	-	-	-	-	-	-	-
Cash In	240,000	112,000	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	-	-	-	-	-	-	-	-	-	-	-
Payment of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ 1,444,630**	**855,000**	**855,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Used for Cash Flows	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ 1,444,630**	**855,000**	**855,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Less: Amount Paid for Projects	(701,630)	-	(855,000)	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ 743,000**	**855,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ 743,000**	**855,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Post-Closure Reserve	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ -	-	-	250,000	500,000	750,000	1,000,000	1,250,000	1,500,000	1,750,000	2,000,000
Cash In	-	-	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	-	-	-	-	-	-	-	-	-	-	-
Payment of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**-**	**250,000**	**500,000**	**750,000**	**1,000,000**	**1,250,000**	**1,500,000**	**1,750,000**	**2,000,000**	**2,250,000**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Used for Cash Flows	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ -**	**-**	**250,000**	**500,000**	**750,000**	**1,000,000**	**1,250,000**	**1,500,000**	**1,750,000**	**2,000,000**	**2,250,000**
Less: Amount Paid for Projects	-	-	-	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ -**	**-**	**250,000**	**500,000**	**750,000**	**1,000,000**	**1,250,000**	**1,500,000**	**1,750,000**	**2,000,000**	**2,250,000**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ -**	**-**	**250,000**	**500,000**	**750,000**	**1,000,000**	**1,250,000**	**1,500,000**	**1,750,000**	**2,000,000**	**2,250,000**

Appendix B

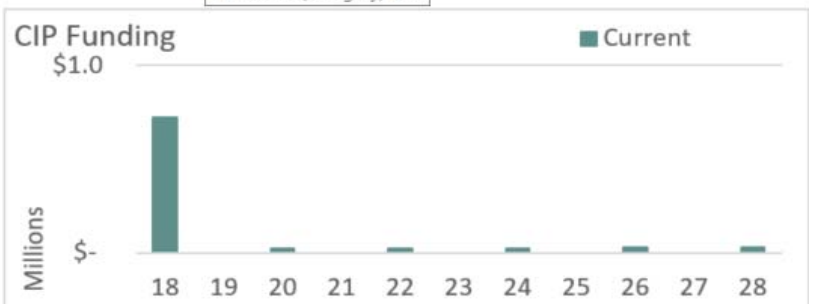
Schedules of Model Data and Assumptions

– Sell Landfill

Schedule 1 - Model Results

City of Bristol, VA
Solid Waste Revenue Sufficiency Analysis

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Revenue Adjustment $M	$0.00	$0.00	$0.44	$0.57	$0.07	$0.08	$0.08	$0.08	$0.08	$0.09	$0.09
Revenue Adjustment %	0.00%	0.00%	30.00%	30.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Average Residential Bill	$22.00	$22.00	$28.60	$37.18	$38.30	$39.44	$40.63	$41.85	$43.10	$44.39	$45.73



Schedule 2 - Model Assumptions & Inputs

Assessed Units

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Account Growth											
Total Accounts	7,108	7,100	7,092	7,084	7,076	7,068	7,060	7,052	7,044	7,036	7,028
Change in Accounts		(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
% Change in Accounts		-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%

Spending Execution Assumptions

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Personal Services	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fixed Operations & Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Variable Operations & Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Capital Outlay	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Cost Escalation Factors

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Salaries	N/A	N/A	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
O&M	N/A	N/A	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
R&M	N/A	N/A	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Fuel	N/A	N/A	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Insurance	N/A	N/A	7.00%	6.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
CO	N/A	N/A	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
No Escalation	N/A	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Interest Assumptions

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Interest Earnings on Fund Balances	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Working Capital Reserve Target

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Percent of Annual O&M Expense	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Schedule 3 - Trial Balances as of 6/30/2017

		Solid Waste Fund	Capital Projects Fund	Post-Closure Reserve
Restriction		**Unrestricted**	**-**	**Other**
Assets				
Cash and Cash Equivalents	$	783,561	1,204,630	-
Accounts Receivable, Net of Allowance fo		317,697	-	-
Due from governmental Units		121,716	-	-
Prepaid Items		12,090	-	-
Total Assets	**$**	**1,235,064**	**1,204,630**	**-**
Liabilities				
Accounts Payable	$	(801,934)	-	-
Compensated Absences - current portion		(92,806)	-	-
Total Liabilities	**$**	**(894,740)**	**-**	**-**
Total Available Fund Balance	**$**	**340,324**	**1,204,630**	**-**

Schedule 4 - Cash In

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Rate Revenue Assumptions												
Rate Adjustment		0.00%	0.00%	30.00%	30.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Rate Revenues	**Codes**											
Solid Waste												
Solid Waste Rate Revenue	100100001	$ 1,466,000	1,464,367	1,901,532	2,469,204	2,540,408	2,613,661	2,689,024	2,766,557	2,846,321	2,928,381	3,012,803
Total Rate Revenues		**$ 1,466,000**	**1,464,367**	**1,901,532**	**2,469,204**	**2,540,408**	**2,613,661**	**2,689,024**	**2,766,557**	**2,846,321**	**2,928,381**	**3,012,803**
Other Operating Revenues												
Solid Waste - Disposal Fees	1000000001	$ 3,223,915	3,112,245	-	-	-	-	-	-	-	-	-
Recycling Income	1000000002	40,000	44,000	-	-	-	-	-	-	-	-	-
Mulch/Compost	1000000004	55,000	40,000	-	-	-	-	-	-	-	-	-
Dumpster Permit Fee	100100003	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Total Other Operating Revenues		**$ 3,368,915**	**3,246,245**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**
Transfer from General Fund	200000004	$ 1,386,680	1,107,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480
Total Transfers In		**$ 1,386,680**	**1,107,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**
Total Cash In		**$ 6,221,595**	**5,818,092**	**2,559,012**	**3,126,684**	**3,197,888**	**3,271,141**	**3,346,504**	**3,424,037**	**3,503,801**	**3,585,861**	**3,670,283**

Schedule 5 - Cash Out

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Personal Services	**Codes**											
Salaries & Wages - Regular	110101180	$ 559,624	520,587	-	-	-	-	-	-	-	-	-
Salaries & Wages - Overtime	110101280	35,000	29,855	-	-	-	-	-	-	-	-	-
Salaries & Wages - Overtime-Special	110101281	1,000	1,000	-	-	-	-	-	-	-	-	-
FICA	110102100	45,871	42,222	-	-	-	-	-	-	-	-	-
VRS Retirement	110102210	76,924	81,841	-	-	-	-	-	-	-	-	-
Hospitalization Insurance	110102310	111,772	111,772	-	-	-	-	-	-	-	-	-
VRS Life Insurance	110102400	7,001	6,436	-	-	-	-	-	-	-	-	-
VRS Disability Insurance	110102450	889	1,046	-	-	-	-	-	-	-	-	-
Unemployment	110102600	1,075	1,075	-	-	-	-	-	-	-	-	-
Worker's Compensation	110102710	24,327	24,327	-	-	-	-	-	-	-	-	-
Salaries & Wages - Regular	120201180	378,018	322,256	335,146	348,552	362,494	376,994	392,074	407,757	424,067	441,030	458,671
Salaries & Wages - Overtime	120201280	9,000	5,809	6,041	6,283	6,534	6,796	7,068	7,350	7,644	7,950	8,268
Salaries & Wages - Overtime-Special	120201281	3,000	3,000	3,120	3,245	3,375	3,510	3,650	3,796	3,948	4,106	4,270
FICA	120202100	29,837	25,363	26,378	27,433	28,530	29,671	30,858	32,092	33,376	34,711	36,099
VRS Retirement	120202210	57,345	53,256	55,386	57,602	59,906	62,302	64,794	67,386	70,081	72,885	75,800
Hospital Insurance	120202310	82,729	82,729	88,520	93,831	98,523	103,449	108,621	114,052	119,755	125,743	132,030
VRS Life Insurance	120202400	4,952	4,184	4,477	4,745	4,983	5,232	5,494	5,768	6,057	6,359	6,677
VRS Disability Insurance	120202450	170	204	218	231	243	255	268	281	295	310	326
Unemployment	120202600	683	683	710	739	768	799	831	864	899	935	972
Worker's Compensation	120202710	20,768	20,768	21,599	22,463	23,361	24,296	25,267	26,278	27,329	28,422	29,559
Subtotal Personal Services		**$ 1,449,985**	**1,338,413**	**541,596**	**565,124**	**588,717**	**613,303**	**638,924**	**665,625**	**693,451**	**722,450**	**752,672**
Personal Services Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Personal Services		**$ 1,449,985**	**1,338,413**	**541,596**	**565,124**	**588,717**	**613,303**	**638,924**	**665,625**	**693,451**	**722,450**	**752,672**
Fixed Operations & Maintenance												
Contract Labor	120103135	$ 40,000	40,000	-	-	-	-	-	-	-	-	-
Professional Services	120103140	190,000	190,000	-	-	-	-	-	-	-	-	-
Recycle Expenses	120103145	100,000	100,000	-	-	-	-	-	-	-	-	-
Maintenance of Building & Property	120103310	35,000	35,000	-	-	-	-	-	-	-	-	-
Maintenance of Machinery & Equip.	120103320	35,000	35,000	-	-	-	-	-	-	-	-	-
Advertising	120103600	3,000	3,000	-	-	-	-	-	-	-	-	-
Utilities	120105100	393,600	393,600	-	-	-	-	-	-	-	-	-
Communications	120105230	8,200	8,200	-	-	-	-	-	-	-	-	-
Lease/Rent of Equipment	120105410	341,400	293,179	-	-	-	-	-	-	-	-	-
Travel Expense	120105530	2,000	2,000	-	-	-	-	-	-	-	-	-
Education & Training	120105540	3,000	3,000	-	-	-	-	-	-	-	-	-
Dues, Memberships & Subscriptions	120105810	1,500	1,500	-	-	-	-	-	-	-	-	-
Printing & Office Supplies	120106001	1,500	2,000	-	-	-	-	-	-	-	-	-
Housekeeping Supplies	120106005	1,500	1,500	-	-	-	-	-	-	-	-	-
Material - Building & Property	120106007	140,000	140,000	-	-	-	-	-	-	-	-	-
Motor Fuel & Lubricants	120106008	175,000	175,000	-	-	-	-	-	-	-	-	-
Repair Parts - Equipment	120106009	77,000	77,000	-	-	-	-	-	-	-	-	-
Clothing & Personal Supplies	120106011	3,000	3,000	-	-	-	-	-	-	-	-	-
Operating Supplies & Materials	120106014	45,000	45,000	-	-	-	-	-	-	-	-	-

Operating Expense	120107001	40,000	40,000	-	-	-	-	-	-	-	-	-
Other Equipment	120108101	-	65,000	-	-	-	-	-	-	-	-	-
Contract Labor	120203135	10,000	10,000	10,400	10,816	11,249	11,699	12,167	12,653	13,159	13,686	14,233
Professional Services	120203140	27,000	27,000	27,810	28,644	29,504	30,389	31,300	32,239	33,207	34,203	35,229
Maintenance of Machinery & Equipment	120203320	30,000	30,000	30,900	31,827	32,782	33,765	34,778	35,822	36,896	38,003	39,143
Communications	120205230	2,000	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610
Lease/Rent of Equipment	120205410	127,505	120,452	124,066	127,788	131,621	135,570	139,637	143,826	148,141	152,585	157,163
Travel Expense	120205530	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Education & Training	120205540	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Printing & Office Supplies	120206001	1,500	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957
Motor Fuel & Lubricants	120206008	100,000	100,000	102,000	104,040	106,121	108,243	110,408	112,616	114,869	117,166	119,509
Repair Parts - Equipment	120206009	45,000	45,000	46,350	47,741	49,173	50,648	52,167	53,732	55,344	57,005	58,715
Clothing & Personal Supplies	120206011	2,500	2,500	2,575	2,652	2,732	2,814	2,898	2,985	3,075	3,167	3,262
Operating Supplies	120206014	10,000	11,000	11,330	11,670	12,020	12,381	12,752	13,135	13,529	13,934	14,353
Bank Service Expense	220109140	2,300	2,300	2,369	2,440	2,513	2,589	2,666	2,746	2,829	2,914	3,001
Subtotal Fixed Operations & Maintenance		**$ 1,998,505**	**2,009,731**	**364,495**	**374,513**	**384,817**	**395,412**	**406,309**	**417,516**	**429,042**	**440,896**	**453,088**
Fixed Operations & Maintenance Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Fixed Operations & Maintenance		**$ 1,998,505**	**2,009,731**	**364,495**	**374,513**	**384,817**	**395,412**	**406,309**	**417,516**	**429,042**	**440,896**	**453,088**

Capital Outlay

Other Improvements or Construction	120108112	$ -	60,000	-	-	-	-	-	-	-	-	-
Other Equipment	120208101	1,000	-	-	-	-	-	-	-	-	-	-
Subtotal Capital Outlay		**$ 1,000**	**60,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Capital Outlay Execution		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Executed Capital Outlay		**$ 1,000**	**60,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Debt Service

Senior Lien Debt												
Other Debt Service Costs	210109130	$ 1,500	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524
2007 Series A- 69%		141,795	-	-	-	-	-	-	-	-	-	-
2007 Series C- 86%		517,758	56,880	56,880	56,880	56,880	529,047	535,006	-	-	-	-
2010 Restructuring- 75%		449,733	193,575	193,575	193,575	193,575	193,575	193,575	1,211,756	1,651,688	1,710,469	-
2010 Go Bond		11,631	-	-	-	-	-	-	-	-	-	-
2012C AMT Series		39,719	39,719	392,819	370,450	266,397	253,906	-	-	-	-	-
2014- Go Bond- 63%		510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	510,229	966,979
2016A Bond AMT- 68%		359,741	360,261	359,977	360,249	359,717	359,741	-	-	-	-	-
2018 SWDF Refunding Bonds		-	584,508	661,707	661,707	661,707	661,707	661,707	661,707	661,707	661,707	661,707
Subtotal Senior Lien Debt		**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Total Debt Service		**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**

Transfers Out

Transfer to Capital Projects Fund		$ 240,000	112,000	-	-	-	-	-	-	-	-	-
Total Transfers Out		**$ 240,000**	**112,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Cash Funded Capital

Cash-Funded CIP		$ 22,000	-	22,660	-	24,040	-	25,504	-	27,057	-	28,705
Total Cash Funded Capital		**22,000**	**-**	**22,660**	**-**	**24,040**	**-**	**25,504**	**-**	**27,057**	**-**	**28,705**
Total Cash Out		**$ 5,743,595**	**5,270,315**	**3,109,087**	**3,098,031**	**3,051,542**	**3,522,547**	**2,977,051**	**3,472,803**	**3,979,323**	**4,052,085**	**2,869,675**

Schedule 6 - Pro Forma

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Rate Increase	0.00%	0.00%	30.00%	30.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Rate Revenues											
Solid Waste Rate Revenue	$ 1,466,000	1,466,000	1,464,367	1,901,532	2,469,204	2,540,408	2,613,661	2,689,024	2,766,557	2,846,321	2,928,381
Revenue from Growth	-	(1,633)	(1,650)	(2,145)	(2,788)	(2,872)	(2,958)	(3,047)	(3,138)	(3,233)	(3,330)
Revenue Before Rate Increase	**$ 1,466,000**	**1,464,367**	**1,462,717**	**1,899,387**	**2,466,415**	**2,537,535**	**2,610,703**	**2,685,977**	**2,763,418**	**2,843,088**	**2,925,051**
Rate Increase	0.00%	0.00%	30.00%	30.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Revenue from Rate Increase	-	-	438,815	569,816	73,992	76,126	78,321	80,579	82,903	85,293	87,752
Total Solid Waste Rate Revenue	**$ 1,466,000**	**1,464,367**	**1,901,532**	**2,469,204**	**2,540,408**	**2,613,661**	**2,689,024**	**2,766,557**	**2,846,321**	**2,928,381**	**3,012,803**
Total Rate Revenues	**$ 1,466,000**	**1,464,367**	**1,901,532**	**2,469,204**	**2,540,408**	**2,613,661**	**2,689,024**	**2,766,557**	**2,846,321**	**2,928,381**	**3,012,803**
Plus: Other Operating Revenues	$ 1,466,000	1,464,367	1,901,532	2,469,204	2,540,408	2,613,661	2,689,024	2,766,557	2,846,321	2,928,381	3,012,803
Operating Income	**$ 2,932,000**	**2,928,734**	**3,803,065**	**4,938,407**	**5,080,815**	**5,227,323**	**5,378,049**	**5,533,113**	**5,692,641**	**5,856,761**	**6,025,605**
Less: Operating Expenses											
Personal Services	$ (1,449,985)	(1,338,413)	(541,596)	(565,124)	(588,717)	(613,303)	(638,924)	(665,625)	(693,451)	(722,450)	(752,672)
Fixed Operations & Maintenance	(1,998,505)	(2,009,731)	(364,495)	(374,513)	(384,817)	(395,412)	(406,309)	(417,516)	(429,042)	(440,896)	(453,088)
Variable Operations & Maintenance	-	-	-	-	-	-	-	-	-	-	-
Total Operating Expenses	**$ (3,448,490)**	**(3,348,144)**	**(906,090)**	**(939,637)**	**(973,533)**	**(1,008,715)**	**(1,045,234)**	**(1,083,141)**	**(1,122,493)**	**(1,163,346)**	**(1,205,761)**
Net Operating Income	**$ (516,490)**	**(419,410)**	**2,896,975**	**3,998,770**	**4,107,282**	**4,218,608**	**4,332,815**	**4,449,972**	**4,570,148**	**4,693,415**	**4,819,844**
Plus (Less): Non-Operating Income in Debt Service Coverage Test											
Non-Operating Revenue	$ -	-	-	-	-	-	-	-	-	-	-
Transfers In	-	-	-	-	-	-	-	-	-	-	-
Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Capital Outlay	-	-	-	-	-	-	-	-	-	-	-
Transfers Out	-	-	-	-	-	-	-	-	-	-	-
Other Below the Line Expenses	-	-	-	-	-	-	-	-	-	-	-
Total Non-Operating	**$ -**	**(419,410)**	**2,896,975**	**3,998,770**	**4,107,282**	**4,218,608**	**4,332,815**	**4,449,972**	**4,570,148**	**4,693,415**	**4,819,844**
Net Income Before Debt Service	**$ (516,490)**	**(838,819)**	**5,793,950**	**7,997,541**	**8,214,564**	**8,437,216**	**8,665,630**	**8,899,944**	**9,140,296**	**9,386,830**	**9,639,689**

Debt Service & Coverage											
Existing Senior Lien Debt Service	$ 2,032,105	1,750,171	2,180,337	2,158,394	2,053,968	2,513,832	1,906,313	2,389,662	2,829,772	2,888,738	1,635,209
New Senior Lien Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Senior Lien Debt Service	**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Senior Lien Debt Service Coverage	0.68	0.78	0.48	0.73	0.79	0.66	0.89	0.73	0.63	0.63	1.14
Existing Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-
New Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Subordinate Debt Service	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subordinate Debt Service Coverage	-	-	-	-	-	-	-	-	-	-	-
Existing Short-Term Debt Service	-	-	-	-	-	-	-	-	-	-	-
New Short-Term Debt Service	-	-	-	-	-	-	-	-	-	-	-
Total Short-Term Debt Service	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Short-Term Debt Service Coverage	-	-	-	-	-	-	-	-	-	-	-
Total Debt Service	**$ 2,032,105**	**1,750,171**	**2,180,337**	**2,158,394**	**2,053,968**	**2,513,832**	**1,906,313**	**2,389,662**	**2,829,772**	**2,888,738**	**1,635,209**
Net Income After Debt Service	**$ (645,680)**	**(387,703)**	**(1,134,894)**	**(578,828)**	**(437,094)**	**(858,885)**	**(212,523)**	**(656,247)**	**(1,055,945)**	**(1,073,704)**	**221,832**
Plus (Less): Non-Operating Income Not in Debt Service Coverage Test											
Non-Operating Revenue	$ -	-	-	-	-	-	-	-	-	-	-
Transfers In	1,386,680	1,107,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480	607,480
Payment of Debt Service with Non-Operating Reveni	-	-	-	-	-	-	-	-	-	-	-
Interest Earnings	-	-	-	-	-	-	-	-	-	-	-
Capital Outlay	(1,000)	(60,000)	-	-	-	-	-	-	-	-	-
Transfers Out	(240,000)	(112,000)	-	-	-	-	-	-	-	-	-
Other Below the Line Expenses	-	-	-	-	-	-	-	-	-	-	-
Total Non-Operating	**$ 1,145,680**	**935,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**	**607,480**
Net Cash Flow	**$ 500,000**	**547,777**	**(527,414)**	**28,652**	**170,386**	**(251,405)**	**394,957**	**(48,767)**	**(448,465)**	**(466,224)**	**829,312**
Fund Balance											
Balance at Beginning of Fiscal Year	$ 340,324	818,324	1,366,101	816,026	844,678	991,024	739,619	1,109,072	1,060,305	584,783	118,559
Net Cash Flow	500,000	547,777	(527,414)	28,652	170,386	(251,405)	394,957	(48,767)	(448,465)	(466,224)	829,312
Total Funds Available	**$ 840,324**	**1,366,101**	**838,686**	**844,678**	**1,015,064**	**739,619**	**1,134,576**	**1,060,305**	**611,840**	**118,559**	**947,872**
Less: Planned Cash Funded Capital	(22,000)	-	(22,660)	-	(24,040)	-	(25,504)	-	(27,057)	-	(28,705)
Balance of Working Capital	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**
Less: Working Capital Reserve Target	-	-	-	-	-	-	-	-	-	-	-
Surplus/Deficit of Working Capital	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**
Less: Additional Cash Funded Capital	-	-	-	-	-	-	-	-	-	-	-
Add Back: Working Capital Reserve	-	-	-	-	-	-	-	-	-	-	-
Balance at End of Fiscal Year	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**

Schedule 7 - Capital Improvement Plan

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Landfill Sidewall Liner	$ 701,630	-	-	-	-	-	-	-	-	-	-
Trash Cart Replacements	22,000	-	22,000	-	22,000	-	22,000	-	22,000	-	22,000
Total Projects	**$ 723,630**	**-**	**22,000**	**-**	**22,000**	**-**	**22,000**	**-**	**22,000**	**-**	**22,000**
Execution %	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
Escalation %	100.0%	100.0%	103.0%	106.1%	109.3%	112.6%	115.9%	119.4%	123.0%	126.7%	130.5%
Total Executed Projects	**$ 723,630**	**-**	**22,660**	**-**	**24,040**	**-**	**25,504**	**-**	**27,057**	**-**	**28,705**

Schedule 8 - Borrowing

Senior Lien Borrowing

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Sources of Funds											
Par Amount	-	-	-	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds											
Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Cost of Issuance	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve	-	-	-	-	-	-	-	-	-	-	-
Other Costs	-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling											
Fiscal Years for Issuance	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$ -	-	-	-	-	-	-	-	-	-	-
Annual Payment	-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Subordinate Borrowing

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Sources of Funds											
Par Amount	-	-	-	-	-	-	-	-	-	-	-
Other Sources	-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds											
Proceeds	$ -	-	-	-	-	-	-	-	-	-	-
Cost of Issuance	-	-	-	-	-	-	-	-	-	-	-

Debt Service Reserve		-	-	-	-	-	-	-	-	-	-	-
Other Costs		-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling												
Fiscal Years for Issuance		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$	-	-	-	-	-	-	-	-	-	-	-
Annual Payment		-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Short-Term Borrowing

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Required Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
Sources of Funds												
Par Amount		-	-	-	-	-	-	-	-	-	-	-
Other Sources		-	-	-	-	-	-	-	-	-	-	-
Total Sources of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Uses of Funds												
Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
Cost of Issuance		-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve		-	-	-	-	-	-	-	-	-	-	-
Other Costs		-	-	-	-	-	-	-	-	-	-	-
Total Uses of Funds	**$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Debt Bundling												
Fiscal Years for Issuance		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Bundled Bond Proceeds	$	-	-	-	-	-	-	-	-	-	-	-
First Year Interest Payment	$	-	-	-	-	-	-	-	-	-	-	-
Annual Payment		-	-	-	-	-	-	-	-	-	-	-
Cumulative Annual Payment		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Schedule 9 - Summary of Funds

Solid Waste Fund	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ 340,324	818,324	1,366,101	816,026	844,678	991,024	739,619	1,109,072	1,060,305	584,783	118,559
Cash In	6,221,595	5,818,092	2,559,012	3,126,684	3,197,888	3,271,141	3,346,504	3,424,037	3,503,801	3,585,861	3,670,283
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	(5,721,595)	(5,270,315)	(3,086,427)	(3,098,031)	(3,027,502)	(3,522,547)	(2,951,547)	(3,472,803)	(3,952,266)	(4,052,085)	(2,840,970)
Planned Cash Funded CIP	(22,000)	-	(22,660)	-	(24,040)	-	(25,504)	-	(27,057)	-	(28,705)
Subtotal	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**
Less: Amount Paid for Projects	-	-	-	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ 818,324**	**1,366,101**	**816,026**	**844,678**	**991,024**	**739,619**	**1,109,072**	**1,060,305**	**584,783**	**118,559**	**919,167**

Capital Projects Fund	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ 1,204,630	743,000	855,000	855,000	855,000	855,000	855,000	855,000	855,000	855,000	855,000
Cash In	240,000	112,000	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	-	-	-	-	-	-	-	-	-	-	-
Payment of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ 1,444,630**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Used for Cash Flows	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ 1,444,630**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**
Less: Amount Paid for Projects	(701,630)	-	-	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ 743,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ 743,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**	**855,000**

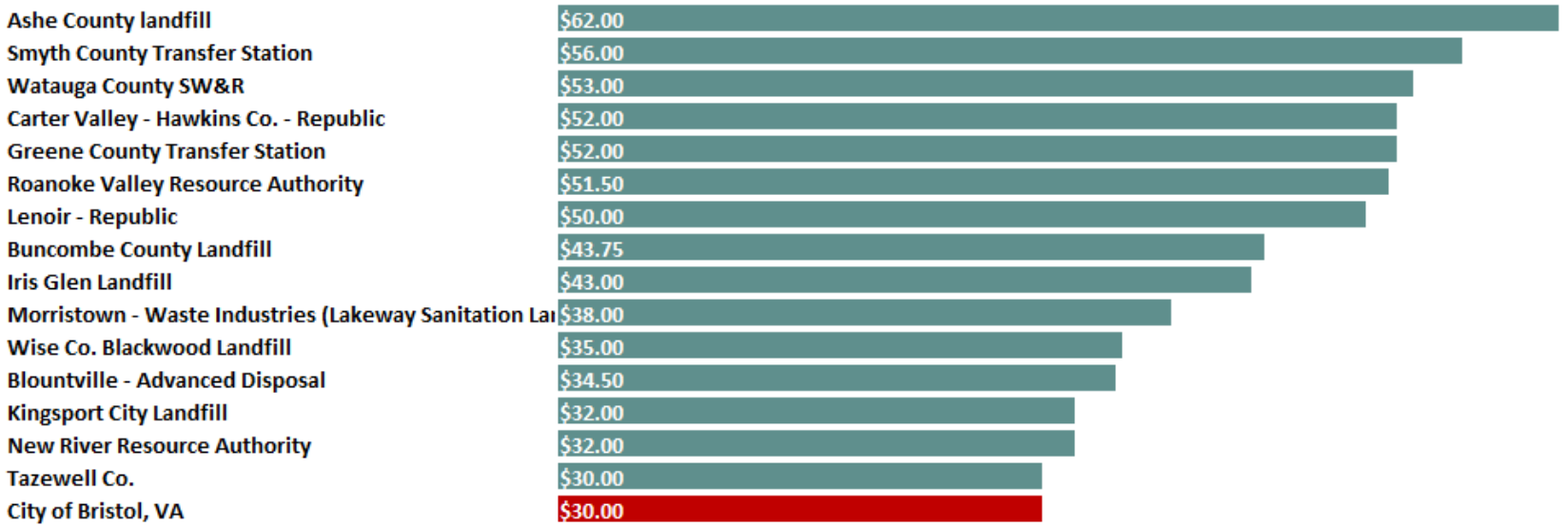
Post-Closure Reserve	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Balance at Start of FY	$ -	-	-	-	-	-	-	-	-	-	-
Cash In	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-
Cash Out	-	-	-	-	-	-	-	-	-	-	-
Payment of Debt Service	-	-	-	-	-	-	-	-	-	-	-
Subtotal	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Less: Interest Used for Cash Flows	-	-	-	-	-	-	-	-	-	-	-
Amount Available for Projects	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Less: Amount Paid for Projects	-	-	-	-	-	-	-	-	-	-	-
Amount Available After Projects	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Plus: Restricted Funds	-	-	-	-	-	-	-	-	-	-	-
Available at End of FY	**$ -**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Appendix C

Landfill Tipping Fee Comparison and

Residential Collection Rate Survey

Tipping Fees by Entity (Gate Rate)



Residential Collection Rates by Entity