

APPENDIX J-7

STRATEGIC PLANNING DOCUMENTATION



Report

Solid Waste Management 2030

Tasks 3 and 4

Prepared for:
Region 2000 Services Authority

May 24, 2017

The Guiding Principles

Open-Minded: to options and diverse perspectives.
Responsible: to our regional community, to our environment, and to our future
. Transparent: in approach and decision-making.

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1.0 EXECUTIVE SUMMARY

Region 2000 Services Authority (Authority) owns and operates a landfill (Permit 610) located in Rustburg Virginia which serves Appomattox County, Campbell County, Nelson County and the City of Lynchburg. In addition, the Authority owns the closed Concord Turnpike Landfill (Permit 558) which received Regional waste from 2008 through 2012 and which has now entered its permitted 30-year post closure care period.

The four localities officially became the Authority on December 28, 2007 and entered into a Member Use Agreement in 2008. The Permit 610 – Livestock Road Regional Landfill facility is anticipated to reach capacity in 2030. Given the nature of solid waste planning and the required time frame for implementation, the Authority determined that it was appropriate to initiate strategic planning activities in 2016 relative to considering the options available for solid waste management after 2030.

The effort has been divided into multiple tasks that work to develop technical evaluations with a numerical benefits analysis in parallel. The first phase (Tasks 1 and 2) presented to the Board at their January 25, 2017 meeting included the development of a public involvement program, definition of the goals, criteria and measurement for ranking the benefits of options, and identification of potential options. The potential options were divided into two categories; the first was disposal options and the second was enhancements e.g. recycling and organic diversion.

The second phase (Tasks 3 and 4) continued the exercise with more detailed technical analysis by Burns and McDonnell supported by Coker Composting relative to the option evaluation and continued effort by Draper Aden Associates and Renaissance Planning on the benefit analysis.

The following summary relative to the Tasks 3 and 4 work is based on the information provided in the Appendices to this report which include the following:

- Appendix 1 – Benefits Analysis prepared by Draper Aden Associations
- Appendix 2 – Options Analysis prepared by Burns and McDonnell
- Appendix 3 – Organics Diversion prepared by Coker Composting and Consulting

2.0 BENEFIT ANALYSIS - SUMMARY

Draper Aden Associates with input from Renaissance Planning completed the benefits analysis and outlined their results in their report entitled, “*Solid Waste Management 2030 – Benefits Analysis*,” dated May 11, 2017. (Appendix 1) For the benefits analysis, Draper Aden Associates worked with the goals, objectives and measurements as outlined in the report presented to the Region 2000 Services Authority Board at their January 25, 2017 meeting. The goals, objectives and measurements were developed by the Working Group in conjunction with their consultants. This report can be accessed at the site below:

http://www.solidwastemanagement2030.org/uploads/4/4/7/9/44790795/rpt_draft_-_17_0125_-_region_2000_-_swp2030_-_tasks_1_and_2_-_submittal.pdf

The Working Group determined that Draper Aden Associates should focus their evaluation on the primary disposal options for the benefit analysis. The enhancements of recycling and composting were not scored as part of this benefit analysis. The disposal options included waste to energy, transfer station at Livestock Road, and a landfill expansion at Livestock Road. The analysis “scores” each option as described below.

The development of the score begins with the criteria. Each criterion has a set of measurements that are the basis for how many points an option can obtain within that criterion. These points are multiplied against the weighting of the criterion to create a point total for the corresponding goal. That point total is then multiplied by the weighting of the goal, which is how the score for each goal is assigned. The score for each goal is then summed to create the overall 0 to 100 score. Further description on the methodology can be found in the Appendix 1 report as can the scoring sheets for each option.

Using this methodology and applying it to the three chosen disposal options provides a ranking of the three options as summarized in the table below (Note that the higher the total the more “beneficial” the option.):

TABLE 1 – SUMMARY OF BENEFIT SCORES

GOAL AND CRITERIA	Maximum Points	Waste to Energy	Transfer Station	Landfill Expansion
REDUCE WASTE (35%)				
Reduce amount of waste disposed of in landfills	17.5	17.5	0.0	0.0
Increase recycling and reuse	17.5	4.4	13.1	0.0
FLEXIBILITY (25%)				
Ability of option to adjust to changes in industry	11.3	0.0	5.6	11.3
Ability of option to adjust to waste types or tonnages	8.8	0.0	4.4	8.8
Simplicity of option for operations and administration	5.0	0.0	3.0	5.0
RESPONSIBLE TO REGION (25%)				
Reduce impact on natural resources	11.3	3.9	8.4	2.9
Reduce financial risk to authority and communities	8.8	4.4	6.1	6.1
Commitment by local governments to option	5.0	3.0	5.0	5.0
MINIMIZE LOCAL IMPACTS (15%)				
Protect community resources	6.0	0.0	3.0	0.0
Minimize infrastructure impacts	6.0	0.0	3.3	3.3
Compatible with local land use policy	3.0	0.0	0.0	0.0
BENEFIT TOTAL	100.0	33.2	52.0	42.3

Based on this ranking, the transfer station option would appear to be the “most beneficial” without consideration of cost. See Section 4.0 of the Appendix 1 report for further detail on the key factors that entered into this scoring.

In summary, the Working Group, working with its consultants, developed a methodology for quantifying the benefits of each option. Table 1 indicates that based on the established goals, criteria and measurements, the transfer option has the highest benefit score. It’s higher score is a function of its potential to promote recycling, traditional technology, minimal risk to the Authority and minimal impact to the community. This evaluation does not consider impacts from the landfill (presumed to be outside of the region) on the resources or the community in which the landfill is located. It also does not consider costs. Costs have been evaluated independently by Burns and McDonnell (See the Appendix 2 report).

With the preparation of the Appendix 1 report, the benefit analysis is completed. Next steps include the following:

- Presentation to the Region 2000 Services Authority Board on May 24, 2017.

- Provision of additional information as may be requested by the Board.

3.0 COST ANALYSIS – SUMMARY

Burns and McDonnell evaluated the disposal and enhancement options in their report entitled, “*Evaluation of Disposal Options and Recycling Enhancements*,” dated May 4, 2017. (Appendix 2) Their work was also informed by the information provided by Coker Composting in Appendix 3 relative to organic diversion. Key assumptions cited in their report include the following:

- Cost information includes direct capital and operating costs, management and oversight, support from Region 2000 staff and other costs as specifically described. Other indirect costs or overhead that the Authority may choose to include in future budget years, e.g. community enhancements, host fees etc. are not included.
- All cost estimates are high level planning estimates and will require further analysis and evaluation once the Authority provides further direction.
- No growth was applied to tonnage projections based on trends relative to landfill tonnage at the current facility and population projections.
- All costs are shown in 2017 dollars, even though expenses incurred in the future are expected to be higher due to inflationary factors. Showing the costs in current dollars allows for easier comparisons to the current costs of the existing landfill operation.
- While the planning is based on a 25-year period, the costs shown in the Appendix 2 report are based on one year of capital and operating costs. Since tonnage is kept constant and all costs are shown in 2017 dollars, there are minimal differences in the annual costs over the 25 year period.
- All options require some form of local government approval (e.g. rezoning, special use permitting and site plan approval). All options require some form of VDEQ permitting.

The following table identifies the disposal options and enhancements (e.g. recycling and organic diversion) and level of detail being provided in the evaluation:

**TABLE 2
INITIAL LIST OF DISPOSAL OPTIONS AND RECYCLING ENHANCEMENTS**

OPTION/ENHANCEMENT	SCENARIO	LEVEL OF DETAIL
Landfill	Continue at existing landfill site	More in-depth analysis
	Expansion of another permitted landfill in the region	The Appomattox County landfill is not a suitable location for the regional landfill so this option was not evaluated further.

OPTION/ENHANCEMENT	SCENARIO	LEVEL OF DETAIL
Transfer Station (TS)	Transfer Station at current landfill site	More in-depth analysis
	Transfer Station at another location in region	Review focused on additional costs to locate a transfer station in another location.
Waste to Energy (WTE)	WTE facility in the region	High-level review based on prior WTE feasibility studies
Regional recycling collection	Develop a regional recycling program	Review focused on potential increase in recycling tonnage collected from member communities.
Material recovery facility (MRF)	MRF at current landfill site	High-level review based on Burns and McDonnell's experience with other small-scale MRFs.
	MRF at another location in region	Review focused on other recycling options available locally and regionally
Mixed Waste Processing (MWP)	MWP at current landfill site	High-level review based on prior MWP feasibility studies
	MWP at another location in region	This scenario not evaluated since location has minimal financial impact on this scenario.
Composting	Source separated organics (SSO)	High-level review included in Appendix 3.

The following table summarizes the Burns and McDonnell cost evaluation for the disposal options as discussed in the Appendix 2 report:

**TABLE 3
ESTIMATED COST PER TON
DISPOSAL OPTIONS**

Option	Annual Tons	Estimated Cost per Ton
Waste-to-Energy	202,850	\$100 – \$135
Landfill Expansion at Livestock Road	202,850	\$30.71
Landfill at Closed Appomattox Landfill	Not evaluated	Not evaluated
Transfer Station at Livestock Road Landfill	133,615	\$61.76
Transfer Station in Lynchburg	133,615	\$62.16 – \$62.76

The following table summarizes the Burns and McDonnell cost evaluation for the recycling enhancements as discussed in the Appendix 2 report and the impact of an enhancement on either the landfill or transfer option.

**TABLE 4
ESTIMATED COST PER TON
DISPOSAL AND ENHANCEMENT OPTIONS**

Enhancement	Estimated Cost per Ton ⁴	Services Included ¹
Enhancements		
Mixed Waste Processing	\$47.40 – \$61.80	Recycling, Composting and Disposal
Utilize Existing Recycling Facility – Local	\$35	Recycling
Utilize Existing Recycling Facility – Regional	(\$20) – \$20 ²	Recycling
New Material Recovery Facility	\$20 – \$70 ³	Recycling
Disposal with Enhancements		
Landfill with Local Recycling	\$31.17	Recycling and Disposal
Transfer Station with Regional Recycling	\$58.84	Recycling and Disposal
Transfer Station with Local Recycling	\$58.56	Recycling and Disposal

1. Services are recycling processing, composting at a third-party and transfer/disposal. No member collection costs are included.
2. The range shown is a net revenue of \$20 per ton to an expense of \$20 per ton.
3. Assumes additional private hauler tonnage is hauled to the MRF.
4. Does not reflect additional costs that may be incurred by the localities in implementing the various programs.

Key findings for the disposal options and recycling enhancements may be summarized as follows.

1. Expanding the existing Livestock Road Landfill is the most financially feasible option at \$30.71 per ton since the Authority already owns the land (adjacent to the current landfill) necessary for the expansion, and has previously constructed the basic infrastructure (e.g. office, scales, maintenance facility, leachate handling facilities), which reduce the capital expenses associated with this option. It should be noted that this analysis is based on a much smaller landfill footprint (compared to the special use permit application from 2014) with increased buffer areas between the active landfill and the neighboring properties.
2. The cost of the transfer station option is approximately twice the cost of the landfill option (approximately \$62 per ton for a transfer station versus approximately \$31 per ton for the landfill option) which is a function of hauling.

3. Waste to energy (WTE) is not financially feasible for the Authority given the high up-front capital and ongoing operating costs (approximately \$100 - \$135 per ton).
4. Mixed waste processing (MWP) has high up-front capital costs and ongoing operating costs. The estimated cost of \$47 - \$62 per ton is higher than the landfill option and about the same as the transfer station. However, it also introduces additional operating risks based on the fluctuation of commodity prices and risk of acceptance of recyclables, particularly fiber, recovered from the MWP facility that could be contaminated.
5. A stand-alone MRF may be financially viable, if additional private tonnage can be sourced and when commodity markets are strong. However, the Authority would have to assume the risk of fluctuating commodity markets. Utilizing a transfer station to haul recyclables to a regional MRF or utilizing a local recycling facility may be financially comparable to a stand-alone Authority MRF based on current commodity markets, without as much additional risk.
6. Utilizing a local recycling facility with the landfill option results in slightly higher per ton costs, on a weighted average basis, when compared to a landfill-only option (less than \$1 increase per ton). This analysis excludes additional collection costs for the member communities.
7. Incorporating recycling, whether local or regional, with a transfer station will slightly reduce the costs of the transfer station option. Burns & McDonnell estimated approximately a \$3 per ton cost reduction on a weighted average basis. This would reduce the transfer station cost from approximately \$62 per ton to approximately \$59 per ton. This analysis excludes additional collection costs for the member communities.

With the preparation of the Appendix 2 report, the options evaluation is completed. Once the Region 2000 Services Authority Board provided further direction, the Authority's staff will develop a timeline for conducting a more detailed technical and financial evaluation.

4.0 BENEFIT TO COST RATIO

After completion of the benefit analysis and option evaluation reports, the next step in the process was to merge the information from these reports together. To develop the benefit to cost ratio, the numerical benefit scores (Appendix 1) are merged with the cost of service for the options (Appendix 2) in a simple calculation (benefit score/cost of service). This is a method that allows the Authority Board to consider the technical costs of a project relative to the benefits. Using the information included in the reports referenced above the benefit to cost ratio for the options was calculated as follows:

TABLE 5
BENEFIT TO COST RATIO CALCULATION

ITEM	OPTIONS		
	Waste to Energy	Transfer Station	Landfill Expansion
Benefit Score	33.2	52.0	42.3
Cost of Service	\$100.00	\$61.76	\$30.71
Benefit to Cost Ratio	0.33	0.84	1.38

Under the benefits analysis, the higher the score the more beneficial. Under the technical evaluation the lower the cost the more cost effective. When merged, the higher the benefit to cost ratio, the more effective the option. For this evaluation, the landfill expansion obtained the higher score and would be considered the more effective option.

5.0 SUMMARY

In summary, the Working Group in conjunction with the consultants developed a methodology for quantifying the benefits of each option and comparing those benefits with the estimated cost of service for the options. This allowed the Working Group to rank the options including both benefits and costs. Based on this evaluation, the expansion of the existing landfill would appear to be the preferred option based on the work completed to date. Waste to energy is not an option under further consideration due to its low benefit score and its high cost relative to the other options.

6.0 NEXT STEPS

The benefit and option analyses under Tasks 3 and 4 have been completed as has the benefit to cost scoring. Next steps include the following:

- Presentation to the Region 2000 Services Authority Board on May 24, 2017.
- Provision of additional information as may be requested by the Board.

APPENDIX J-8
SOLID WASTE SITES

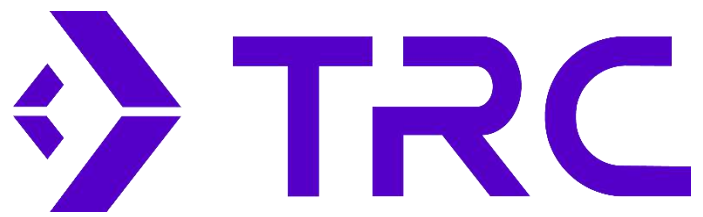
APPENDIX J-8

**REGION 2000 SOLID WASTE MANAGEMENT PLAN 2025 UPDATE
LIST OF PERMITTED FACILITIES IN REGION**

FACILITY NAME	ADDRESS	CITY	STATE	ZIP	TYPE	STATUS	PERMIT NO.
Lynchburg							
REGION 2000 SERVICES AUTHORITY - CONCORD TURNPIKE LANDFILL	2525 CONCORD TURNPIKE	LYNCHBURG	VA	24506	MUNICIPAL, C&D	CLOSED	SWP 010/558
VIRGINIA BAPTIST HOSPITAL	3300 RIVERMONT RD	LYNCHBURG	VA	24503	RMW	CLOSED	PBR 123/292
LYNCHBURG GENERAL HOSPITAL	1901 TATE SPRINGS RD	LYNCHBURG	VA	24501	RMW	CLOSED	PBR 291/124
FLORIDA AVENUE LANDFILL	FLORIDA AVE	LYNCHBURG	VA	24504	INDUSTRIAL LF	CLOSED	SWP 344
HAROLD BEASLEY INC	3106 ODD FELLOWS RD	LYNCHBURG	VA	24501	MRF	CLOSED	PBR 198
FALWELL INDUSTRIAL LANDFILL	4332 RICHMOND HWY	LYNCHBURG	VA	24506	INDUSTRIAL LF	CLOSED	SWP 517
ROCK-TENN COMPANY - TYREEANNA SITE	1801 CONCORD TNPK	LYNCHBURG	VA	24504	INDUSTRIAL LF	CLOSED	SWP 511/232
Appomattox							
APPOMATTOX COUNTY LANDFILL 86	146 RECYCLE LN	APPOMATTOX	VA	24522	MUNICIPAL, C&D	CLOSED	SWP 086
APPOMATTOX COUNTY LANDFILL 86	146 RECYCLE LN/STATE RT 632	APPOMATTOX	VA	24522	TEMP. DEBRIS STORAGE	CLOSED	EMG 105
APPOMATTOX COUNTY LANDFILL 86 - BALING FACILITY	146 RECYCLE LN/STATE RT 632	APPOMATTOX	VA	24522	MRF	CLEAN CLOSED	PBR 163
EMANUEL TIRE MANAGEMENT APPOMATTOX LLC	232 RECYCLE LN	APPOMATTOX	VA	24522	MRF	ACTIVE	PBR 547
Campbell							
GRIFFIN PIPE LANDFILL - MT. ATHOS	STATE RT 726/MT. ATHOS RD	LYNCHBURG	VA	24504	INDUSTRIAL LF	PERMITTED/NC	SWP 559
BWXT NUCLEAR OPERATIONS GROUP, INC	1570 MT ATHOS RD - RTE 726	LYNCHBURG	VA	24504	INDUSTRIAL LF	CLOSED	SWP 217
BWXT NUCLEAR OPERATIONS GROUP, INC	1570 MT ATHOS RD - RTE 726	LYNCHBURG	VA	24504	INDUSTRIAL LF	CLOSED	SWP 202
VCI LYNCHBURG FOUNDRY	1132 MT ATHOS RD	LYNCHBURG	VA	24504	INDUSTRIAL LF	WITHDRAWN	SWP 599
VCI LYNCHBURG FOUNDRY - ARCHER CREEK	1132 MT ATHOS RD	LYNCHBURG	VA	24504	INDUSTRIAL LF	CLOSED	SWP 347
VCI LYNCHBURG FOUNDRY	1132 MT ATHOS RD	LYNCHBURG	VA	24504	INDUSTRIAL LF	POST CLOSURE	SWP 456
VCI LYNCHBURG FOUNDRY	1132 MT ATHOS RD	LYNCHBURG	VA	24504	INDUSTRIAL LF	REVOKED/NC	SWP 106
GERDAU METALS RECYCLING - LYNCHBURG - CYCLE SYSTEMS LF	991 LAWYERS RD	LYNCHBURG	VA	24501	CDD LF	CLOSED	SWP 432
CAMPBELL COUNTY LANDFILL	361 LIVESTOCK RD	RUSTBURG	VA	24588	SANITARY LF	CLOSED	SWP 168
CAMPBELL COUNTY LANDFILL	361 LIVESTOCK RD	RUSTBURG	VA	24588	SANITARY LF	CLOSED	SWP 009
CAMPBELL COUNTY LANDFILL	361 LIVESTOCK RD	RUSTBURG	VA	24588	SANITARY LF	POST CLOSURE	SWP 285
CAMPBELL COUNTY LANDFILL	361 LIVESTOCK RD	RUSTBURG	VA	24588	SANITARY LF	CLOSED	SWP 081
REGION 2000 REGIONAL LANDFILL - LIVESTOCK RD FACILITY	361 LIVESTOCK RD	RUSTBURG	VA	24588	SANITARY LF	ACTIVE	SWP 610
RECOVERY TECHNOLOGIES GROUP OF VIRGINIA INC	354 CAMPBELL HWY	RUSTBURG	VA	24588	TRANSFER STATION	CLOSED	PBR 502
DOC RUSTBURG CORRECTIONAL UNIT 9	479 CAMP NINE RD	RUSTBURG	VA	24588	RMW	CLOSED	PBR 220
ALTAVISTA LANDFILL	AVONDALE DRIVE	ALTAVISTA	VA	24517	SANITARY LF	CLOSED	SWP 043
Nelson							
US TITANIUM LF					INDUSTRIAL LF	CLOSED	SWP294
NELSON COUNTY TRANSFER STATION & LANDFILLS - NELSON COUNTY LANDFILL	972 MORSE LANE	ARRINGTON	VA	22922	SANITARY LF	CLOSED	SWP 242
NELSON COUNTY TRANSFER STATION & LANDFILLS - LOVINGSTON-NELSON COUNTY LANDFILL	972 MORSE LANE	ARRINGTON	VA	22922	SANITARY LF	CLOSED	SWP 328
NELSON COUNTY TRANSFER STATION & LANDFILLS	972 MORSE LANE	ARRINGTON	VA	22922	TRANSFER STATION	ACTIVE	PBR 051
NELSON COUNTY DUMP		SHIPMAN	VA	22971	SANITARY LF	CLOSED	SWP 209

DEQ Environmental data mapper

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