

JEFFERSON COUNTY SOLID WASTE SYSTEM

Preliminary Engineering Report

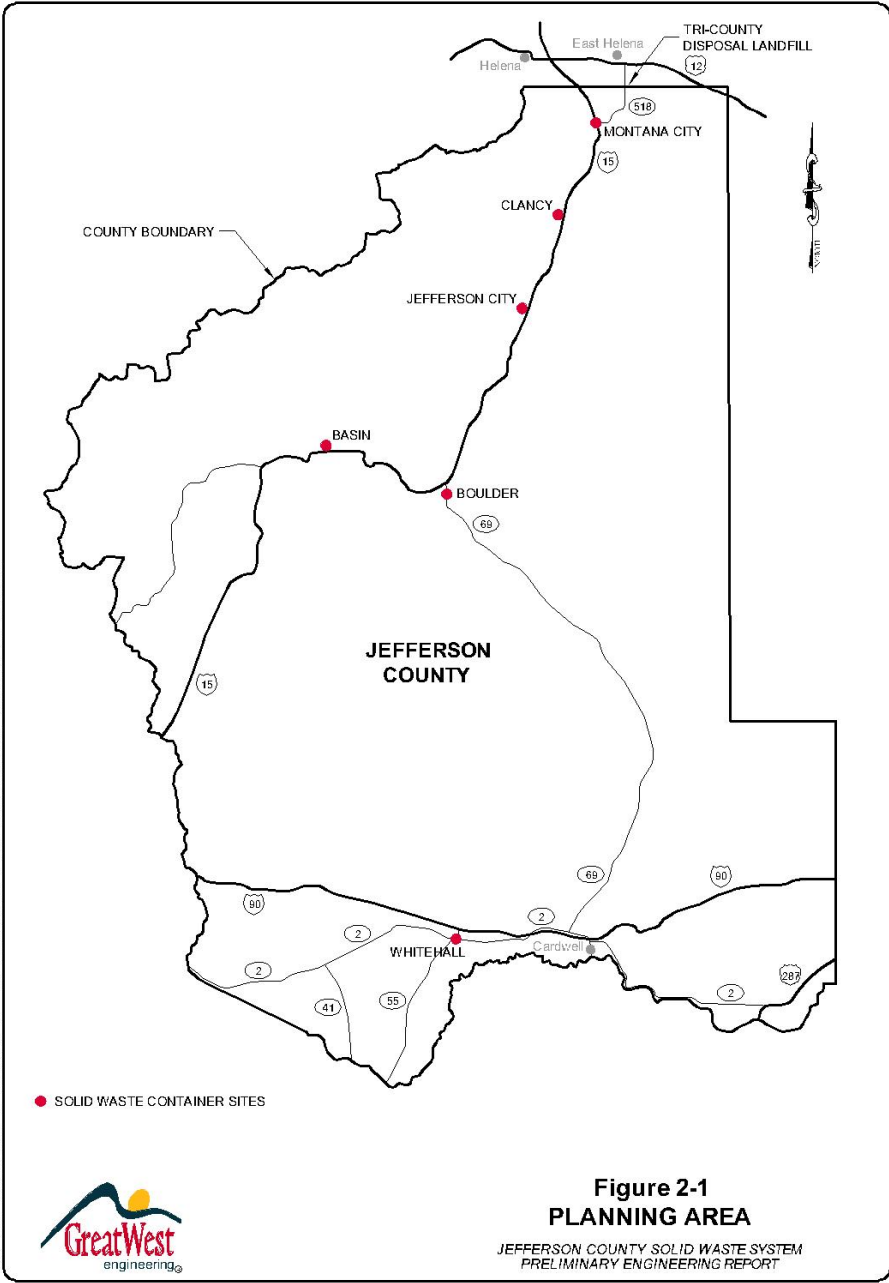
By: Bob Church, PE

Montana City, MT

February 12, 2019



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**Figure 2-1
PLANNING AREA**

JEFFERSON COUNTY SOLID WASTE SYSTEM
PRELIMINARY ENGINEERING REPORT

COUNTY SOLID WASTE SYSTEM

- **County operates six solid waste collection sites**
- **Municipal solid waste**
- **Wood waste**
- **Metal**
- **Other recyclables**
- **All sites attended except Basin**
- **Operating hours vary by site**
- **County operates inert waste landfills at Boulder & Whitehall**



WASTE HAULING

- **County hauls containers from collection sites to Tri-County Disposal Landfill**
- **Tri-County Disposal collects curbside & hauls direct to landfill (northern portion of county)**
- **Giulio Disposal collects curbside & hauls direct to landfill (primarily Boulder area)**

SOLID WASTE SYSTEM STAFF

- **Solid waste supervisor**
- **2 full time truck drivers**
- **4 full time site attendants**
- **Fill-in drivers & attendants**

SOLID WASTE SYSTEM REVENUE

- **Property tax assessments
(\$129.69/unit/year)**
- **Inert & special waste fees**
- **Metal recycling**
- **Other recyclable revenue**

SOLID WASTE SYSTEM REVENUE

Table 3-1 – Annual Revenue History (rounded to the nearest \$1,000)

Item	2014/2015	2015/2016	2016/2017
Real Property Assessments	728,000	728,000	740,000
Personal Assessments	65,000	55,500	61,000
Penalties and Interest	6,500	8,000	6,500
Solid Waste			
Permits/Collection	1,500	1,500	1,500
Tire Disposal	2,500	3,000	4,000
Refrigerators	2,000	2,500	2,000
Construction Waste Fees	16,000	16,500	15,000
Cardboard		2,000	1,500
Paper		500	500
Aluminum		1,500	1,500
Junk & Metal Salvage	28,000	14,500	21,000
Miscellaneous Revenue	10,000	9,000	11,000
Investment Earnings	1,500	2,000	5,000
Total	861,000	845,000	870,500

EXPENSE HISTORY

Table 3-2 – Solid Waste District Expense History

Item	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18 ⁽¹⁾
Salaries & Benefits	444119	463109	485368	427006	310445
Equipment Repairs, Maintenance & Parts	39826	37838	40669	32910	23520
Supplies & Equipment	24991	2518	9869	8205	2538
Tipping Fees	160560	181574	188362	184032	143349
Landfill Services (Giulio Hauling)	19561	22954	24937	20286	20151
Fuel & Diesel Fuel	47583	38671	25355	23345	19261
Office & Utility Costs	7715	6689	5871	5577	4327
Wood Processing	15600	240	0	0	0
Recycling	0	0	150	3940	3484
GASB 45	30947	0	0	0	0
Professional Services	21986	9344	7880	7020	4262
Liability Insurance	16028	16176	16548	18359	21286
Licensing	1239	1240	1200	1241	2127
Other Miscellaneous Expenses	10229	8896	11570	7759	8281
Total	840384	789249	817779	739680	563031

⁽¹⁾ Expenses through Feb 2018

POPULATION PROJECTION

Table 2-1 – Population Projections 2018-2038

Year	County Population
2018	11,983 ¹
2038	16,096 ¹

(¹) Regional Economic Models, Inc.

WASTE TONNAGE HISTORY & PROJECTIONS

Table 3-3 – Waste Volume & Population History

Fiscal Year	Annual Landfill Tonnage	Burned Wood Waste	Class III & Tires	Recycled Wastes	Total Waste Tonnage	Population	Waste Generation (lb/person / day)
2014-2015	6,124	500 ⁽¹⁾	500 ⁽¹⁾	300 ⁽¹⁾	7,424	11,788	3.1
2015-2016	6,415	555	500 ⁽¹⁾	315	7,785	11,853	3.6
2016-2017	6,478	498	500 ⁽¹⁾	320	7,796	11,918	3.6

⁽¹⁾ Estimated tonnage based on previous year's information

WASTE TONNAGE HISTORY & PROJECTIONS

Table 3-4 – Detailed List of Diverted Waste

Fiscal Year	Aluminum Tons	Mixed Paper Tons	Cardboard Tons	Metal Tons	Total Tons
2014-2015					-
2015-2016	1.9	29.8	65.4	218	315
2016-2017	1.6	34.4	49	235	320
2017-2018	3.5	21.6	68.6	185	279

Table 3-5 – Waste Volume & Service Area Population Projections

Year	Total Waste Tonnage	Population	Waste Generation (lbs/person/day)
2018	7,796	11,983	3.6
2038	10,575	16,096	3.6

WASTE ORIGINATION

Table 3-6 – Annual Container Site Tonnage

	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18
MONTANA CITY	1737.17	1820.83	1840.5	1188.67
BOXES	414	545	570	374
TONS/BOX	4.2	3.3	3.2	3.2
CLANCY	400.35	396.33	412.98	266.54
BOXES	112	148	146	95
TONS/BOX	3.6	2.7	2.8	2.8
JEFF CITY	276.72	295.87	281.5	173.8
BOXES	83	106	104	66
TONS/BOX	3.3	2.8	2.7	2.6
BASIN	79.45	99.09	109.22	63.47
BOXES	30	42	47	27
TONS/BOX	2.6	2.4	2.3	2.4
BOULDER	543.64	582.66	605.3	376.71
BOXES	91	180	180	119
TONS/BOX	6.0	3.2	3.4	3.2
WHITEHALL	1617.49	1792.97	1676.26	1047.81
BOXES	165	223	158	140
TONS/BOX	9.8	8.0	10.6	7.5

(1) At Whitehall most of the time two containers are hauled, but in the winter a trailer is NOT used when roads are bad

WASTE ORIGINATION

Table 3-7 – Annual Landfilled Solid Waste Tonnage

	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18 ⁽¹⁾
ANNUAL TOTAL	6123.89	6415.43	6478.49	4285.83
JEFF CO CONTAINER SITE TONNAGE	4713.7	4987.75	4925.76	3117
GIULIO CURB SIDE	771.26	779.03	795.74	625.31
TRI-COUNTY DISPOSAL CURB SIDE	638.93	648.65	756.99	543.59
(1) Thru Feb 2018 (2/3) 4 months left (1/3)				

ALTERNATIVES EVALUATED IN DETAIL

- **Load consolidation at Boulder (Alternatives 2C & 2D)**
- **Closure of Clancy, Jefferson City & Basin sites (Alternative 2E)**
- **Replacement of Montana City site (Alternatives 3D & 3E)**
- **Pay-as-you-Throw alternatives (Alternatives 4A & 4B)**
- **Wood waste alternatives (Alternatives 5A & 5C)**

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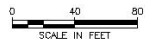


Figure 3-1
Montana City Container Site

JEFFERSON COUNTY SOLID WASTE SYSTEM
PRELIMINARY ENGINEERING REPORT

ALTERNATIVE 2C – MINI EXCAVATOR LOAD CONSOLIDATION AT BOULDER SITE

- **Mini-excavator consolidation will increase average container tonnage from 3.2 tons/container to 7.0 tons/container**
- **Reduction in hauling mileage provides cost savings**
- **\$35,000 late model mini-excavator**
- **Operations, maintenance & ownership costs = \$15,300/year**
- **Hauling cost savings = \$21,400/year**
- **Payback 6 years**

ALTERNATIVE 2D – STATIONARY COMPACTOR CONSOLIDATION AT BOULDER

- **2 stationary compactors/ 4 compactor containers**
- **Generator required for 3 phase power at site**
- **Increases container tonnage from 3.2 tons to 9.0 tons/container**
- **Capital cost = \$257,000**
- **Annual O&M = \$2,500/year**
- **Hauling cost savings = \$25,700/year**
- **Payback = 10.8 years**

ALTERNATIVE 2E – CLOSURE OF CLANCY, JEFFERSON CITY & BASIN SITES

- **3 sites combine for 16% of tonnage collected by county**
- **Clancy (8%), Jefferson City (6%), Basin (2%)**

Item	Savings
Labor Cost Savings	\$57,300/year
Container Hauling Cost Savings	\$29,500/year
Total Annual Savings	\$86,800/year
Annual Savings Per Unit	\$14/unit

- **Alternative results in reduction in services to County residents in these areas**

CAPACITY OF SITES

- **All sites adequate to handle traffic & tonnage through planning period except Montana City.**
- **Traffic counts – Montana City**
 - **Peak day May 2016 – 595 vehicles**
 - **Peak day May 2018 – 725 vehicles**
- **Traffic issues on McClellan Creek Road**



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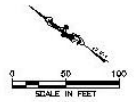
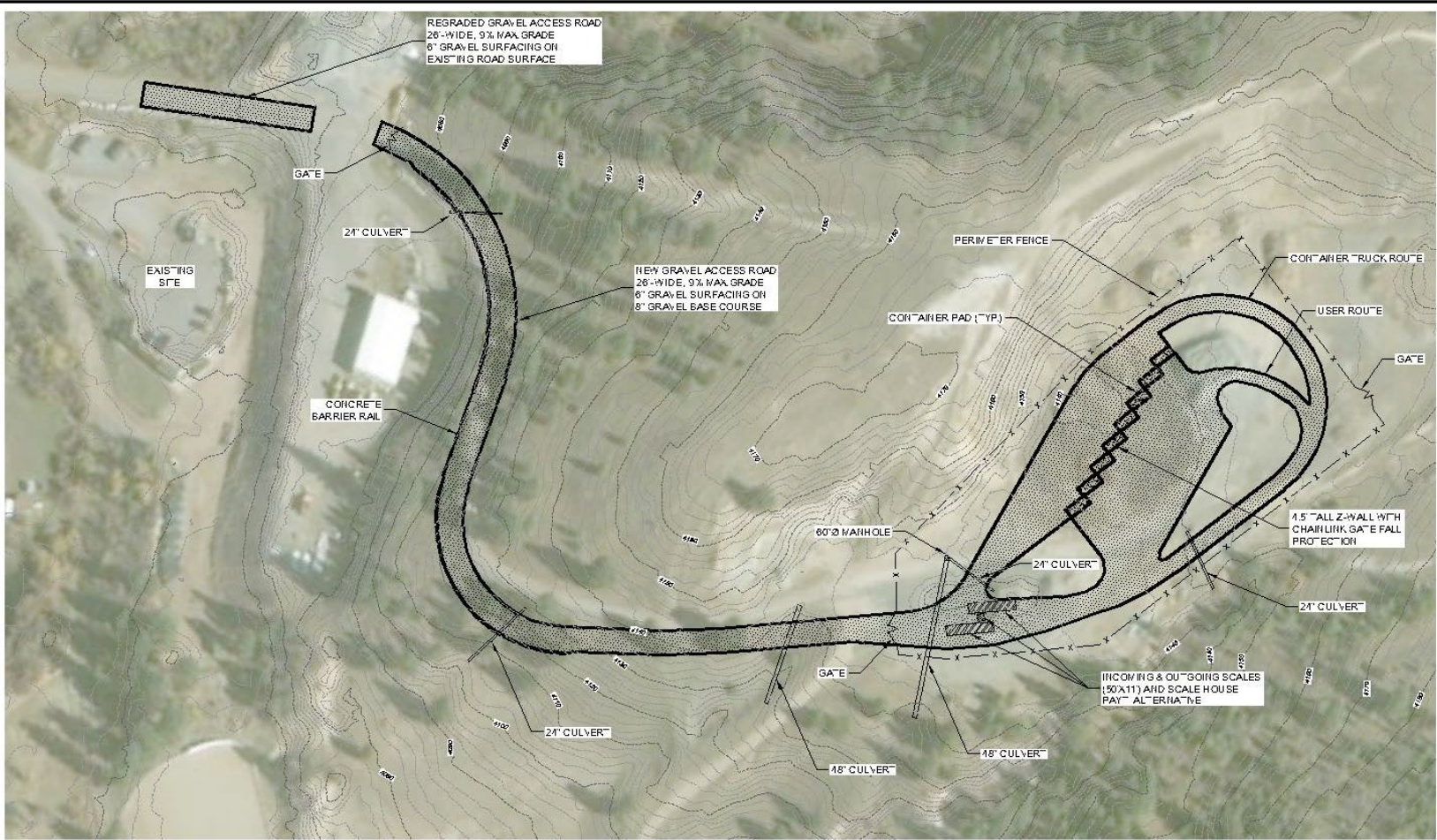
Figure 3-1
Montana City Container Site

JEFFERSON COUNTY SOLID WASTE SYSTEM
PRELIMINARY ENGINEERING REPORT

MONTANA CITY SITE ALTERNATIVES

- **No action (not viable)**
- **Construct new container site on
County owned property
(Alternative 3D)**
- **Construct new container site at
Tri-County Landfill (Alternative 3E)**

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**Figure 5-2
ALTERNATIVE 3D
MONTANA CITY CONTAINER SITE
SITE PLAN**

JEFFERSON COUNTY SOLID WASTE SYSTEM
PRELIMINARY ENGINEERING REPORT

ALTERNATIVE 3D – NEW CONTAINER SITE ON COUNTY OWNED PROPERTY

- **8 bay container site**
- **Access road improvements**
- **Plenty of room for future traffic & staging**
- **Room for future expansion/special waste handling**
- **County retains control of system**
- **\$794,000 construction cost**
- **Estimated increase to assessment (\$10.30/unit)**

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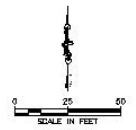
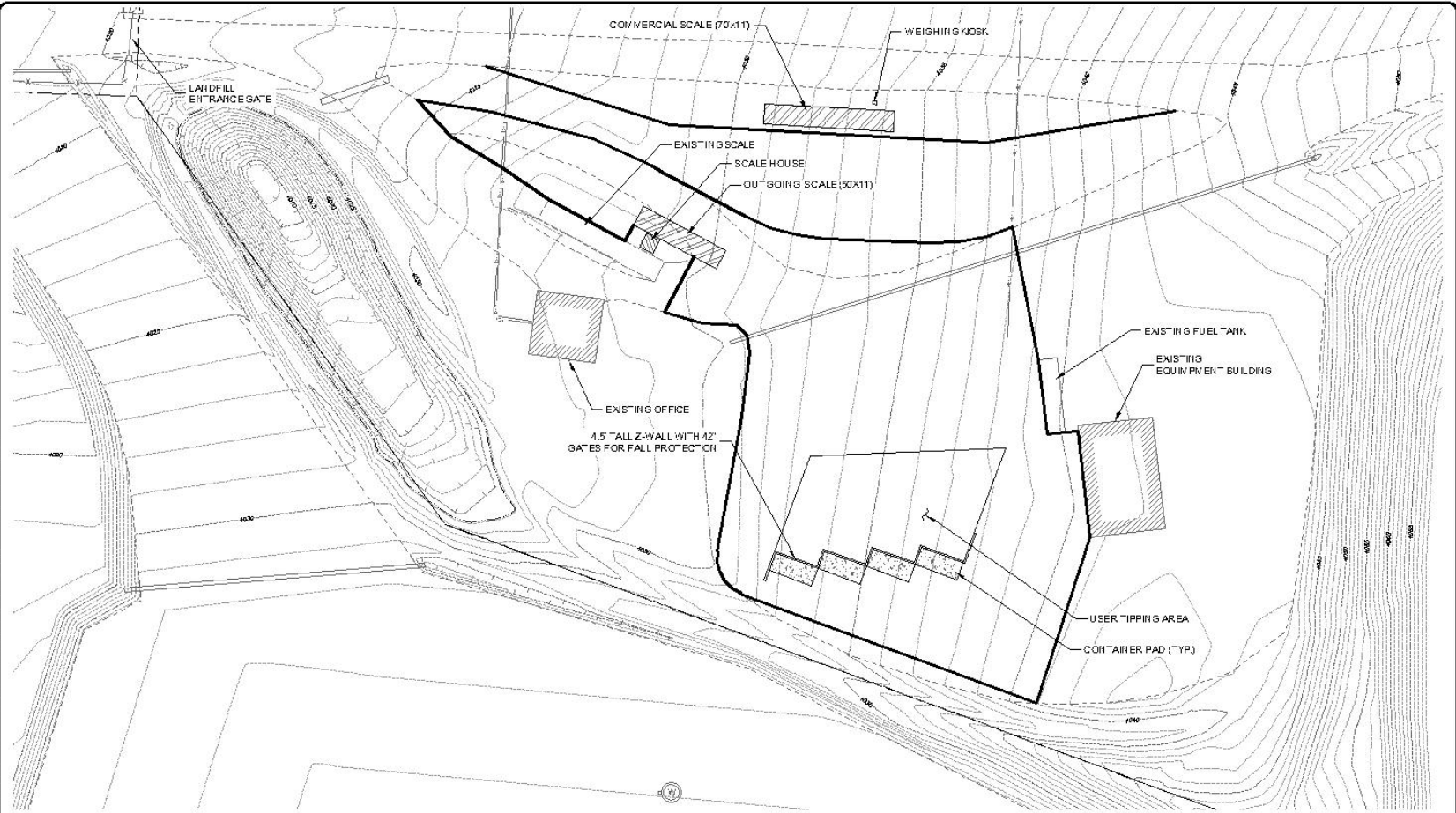


Figure 5-3
ALTERNATIVE 3E
TRI-COUNTY LANDFILL
CONTAINER SITE
SITE PLAN

JEFFERSON COUNTY SOLID WASTE SYSTEM
PRELIMINARY ENGINEERING REPORT

ALTERNATIVE 3E – CONSTRUCT NEW CONTAINER SITE AT TRI-COUNTY LANDFILL

- **New 4 bay container site**
- **Wood & bulky wastes hauled directly to landfill face**
- **Scale system upgrade**
 - **Addition of outbound scale & scale house for public customers**
 - **Separate commercial scale**
 - **Software/computer upgrades**

ALTERNATIVE 3E – CONSTRUCT NEW CONTAINER SITE AT TRI-COUNTY LANDFILL

- **Requires long term commitment to Tri-County Disposal**
- **County will pay for Tri-County Disposal labor for container site operation (scale attendant & truck driver)**
- **Requires closure of Clancy & Jefferson City sites because of scales**

ALTERNATIVE 3E –NEW CONTAINER SITE AT TRI-COUNTY LANDFILL

Item	Cost/Savings
Capital Cost	\$452,000
Payback over 10 years	\$45,200/year
Tri-County Disposal Annual Labor Costs	\$148,500/year
County Labor Cost Savings (Montana City, Clancy & Jefferson City)	\$136,000/year
Container Hauling Savings (Montana City, Clancy & Jefferson City)	\$41,200/year
Net Annual Cost of Alternative	\$16,500/Year
Additional Cost/Assessment	\$2.65/unit

ALTERNATIVE 4A – CURRENT PAY-AS-YOU-THROW (PAYT) SYSTEM

- **Under PAYT customers pay only for the volume of waste they generate**
- **Residential currently assessed single units**
- **Commercial accounts charged multiple units based on waste generation**
- **Does not account for residential accounts with high or low system usage**
- **Not equitable for residential users**

ALTERNATIVE 4B – WEIGHT-BASED PAYT SYSTEM

- **Equitable**
- **Economic incentive for reduction, reuse & recycling**
- **Typically customer allocated “free tonnage” per unit assessed**
- **Current average generation rate = 1.2 tons/year**

ALTERNATIVE 4B – WEIGHT-BASED PAYT SYSTEM

- **Installation of scales**
 - **2 scale system Montana City**
 - **1 scale system Boulder & Whitehall**
- **Closure of Clancy, Jefferson City & Basin sites (inadequate space for scales)**
- **Scale houses, software, computers**
- **Full time scale attendant Montana City**
- **Part time scale attendant Boulder & Whitehall**

ALTERNATIVE 4B – WEIGHT-BASED PAYT SYSTEM

Item	Cost/Savings
Capital Cost	\$474,800
Labor Cost Increase	\$118,900/year
Labor Savings (site closures)	\$57,300/year
Container Hauling Savings (site closures)	\$23,800/year
Net Annual Labor Cost	\$37,800/year
Annual Debt Service (20 year-3.875%)	\$38,000/year
Total Annual Cost of Alternative	\$75,800/year
Cost to User	\$12.18/unit

WOOD WASTE TONNAGE

Table 3-8 – Wood Waste Quantities

Site	2015/2016	2016/2017	2017/2018 ⁽¹⁾
Montana City			
Tons	410 ⁽²⁾	405	331
Boxes	128	126	103
Tons/Boxes	3.2	3.2	3.2
Clancy			
Tons	68	46	41
Boxes	30	19	17
Tons/Boxes	2.3	2.4	2.4
Boulder			
Tons	105 ⁽³⁾	120 ⁽³⁾	60 ⁽³⁾
Whitehall			
Tons	450 ⁽³⁾	378 ⁽³⁾	450 ⁽³⁾
Total Tons	1,033	946	882

Notes:

- (1) Tonnage through March 2018
- (2) Tonnage Based on Number of boxes @ 3.2 tons/box measured over last two years
- (3) Estimated on burn pile size @ 300 lb/cy

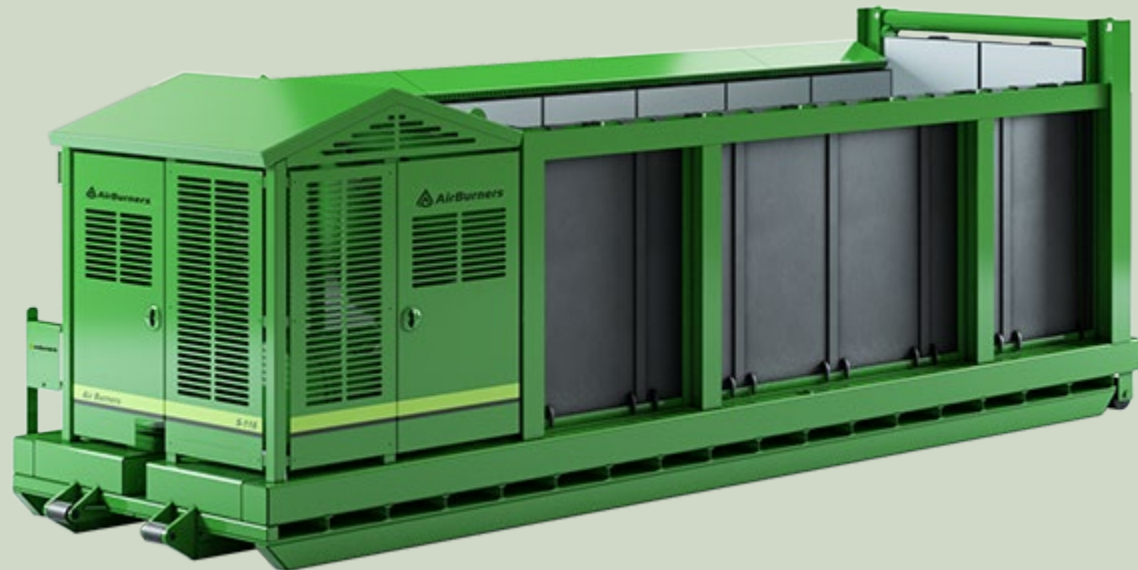


WOOD WASTE SYSTEM

- **Wood waste collected at Boulder & Whitehall - Stockpiled & open burned**
- **Wood waste collected at Clancy & Montana City – Landfilled**
- **Open burning is lowest cost alternative (estimated at \$16.70/ton)**
- **Alternatives examined for Clancy/Montana City wood waste**
- **Alternative 5A is current approach**

ALTERNATIVE 5C – AIR CURTAIN BURNING CLANCY/MONTANA CITY WOOD WASTE

- **Air curtain burn**
- **Allows clean & contained burn**
- **Fed with excavator (5 tons/hour)**



ALTERNATIVE 5C – AIR CURTAIN BURNER ALTERNATIVE

Item	Cost
Capital Cost	\$120,000
Additional Operations & Maintenance Costs	\$11,500/year
Container Hauling Savings	\$3,600/year
Disposal Savings	\$10,400/year
Net Annual Operations Savings	\$2,500/year
Annual Debt Collection (10 years-4%)	\$14,800/year
Total Annual Cost of Alternative	\$12,300/year
Cost to User	\$2.00/unit/year

THANK YOU!