

ITEM #: 17
DATE: 03-28-23
DEPT: PW

COUNCIL ACTION FORM

SUBJECT: 2022 RESOURCE RECOVERY SYSTEM ANNUAL REPORT

BACKGROUND:

Each year, a report of the preceding year's activities in the Resource Recovery System (RRS) is produced. The 2022 report is now presented for City Council review (attached).

In calendar year 2022, many major capital improvements were completed at the Ames Power Plant, providing increases in efficiency and the amount of material processed by the RRS. The partner communities and agencies generated 51,541 tons of municipal solid waste (MSW) during 2022. Of this amount, approximately 46,652 tons were received at the plant and processed to create 29,417 tons of Refuse Derived Fuel (RDF).

An estimated 1,517 tons of metal and 256 tons of glass were recovered for recycling. Additional items diverted from the landfill included 20 tons of Household Hazardous Materials, 51 tons of organics, 720 appliances, and 943 tires. Rummage RAMPage was held once again in 2022, finding new uses and homes for approximately 72 tons of household items that would have otherwise been destined for the landfill.

For the next fiscal year, the per capita fee charged to member agencies will remain at \$10.50 and will be billed according to the results of the 2020 census. Based on projected financial needs to meet future operating, maintenance, and capital needs, the tipping fee was raised to \$62.50 beginning July 1, 2022.

A Waste-to-Energy Options Study, prepared by RRT Design and Construction, was presented to City Council on December 20, 2022. This shared study between Resource Recovery and Electric Services could lead to significant changes to improve the solid waste handling and energy production systems. City Council accepted the report and directed staff to continue further evaluation of alternative systems and partnerships. Additionally, this year staff will evaluate potential options for electronics and single stream recycling. **It should be noted that any direction for a new or updated facility could lead to increases in the tipping and per capita fees.**

ALTERNATIVES:

1. Accept the 2022 Resource Recovery System Annual Report.
2. Request further information from staff.

CITY MANAGER'S RECOMMENDED ACTION:

Completing major improvements at the Power Plant last year increased the efficiency and capacity of utilizing RDF. The redundancy achieved by completing these major improvements in both Power Plant boilers will continue to provide more consistent service for the haulers and other customers along with reducing the amount of material being landfilled.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, as described above.

ANNUAL REPORT 2022



ARNOLD O.
CHANTLAND

RESOURCE
RECOVERY
SYSTEM

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PUBLIC WORKS



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Thank You to our partners in Sustainability!

Nevada, Story City, Huxley, Slater, Roland, Gilbert, Maxwell,
Cambridge, Zearing, McCallsburg, Kelley, Story County,
Iowa State University, Boone County Landfill

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February 28, 2023

Dear Resource Recovery System Members:

Many major capital improvements have been completed at the Ames Power Plant, providing increases in efficiency and the amount of material processed by the Resource Recovery System (RRS). Since the beginning of RRS operations in 1975, it has been an effective, efficient, and environmentally focused waste management and landfill diversion system for all the member agencies.

The partner communities and agencies generated 51,541 tons of municipal solid waste (MSW) during 2022 with approximately 46,652 tons received at the plant and processed to create 29,417 tons of Refuse Derived Fuel (RDF). An estimated 1,517 tons of metal and 256 tons of glass were recovered for recycling. Additional items diverted from the landfill included 20 tons of Household Hazardous Materials, 51 tons of organics, 720 appliances, and 943 tires. Rummage RAMPage was held once again in 2022, finding new uses and homes for approximately 72 tons of household items that would have otherwise been destined for the landfill! RRS continues to be a responsible, sustainable, local solution for waste from our partner agencies.

The per capita fee charged to member agencies will remain at \$10.50 and will be billed according to the results of the 2020 census. Based on projected financial needs to meet future operating, maintenance and capital needs, the tipping fee was raised to \$62.50 beginning July 1, 2022.

The study that evaluated alternatives for optimizing the Waste-to-Energy process, produced by RRT Design and Construction, was presented to the Ames City Council on December 20, 2022. This was a shared study between Resource Recovery and Electric Services that could lead to significant changes to improve the solid waste handling and energy production systems. City Council accepted the report and directed staff to continue further evaluation of alternative systems and partnerships. Additionally, this year staff will evaluate potential options for electronics and single stream recycling. **It should be noted that any direction for a new or updated facility could lead to increases in the tipping and per capita fees.**

We are truly grateful to the member agencies for our long-standing partnership and their **continuing commitment to sustainability!** Our continuing partners are Nevada, Story City, Huxley, Slater, Roland, Gilbert, Maxwell, Cambridge, Zearing, McCallsburg, Kelley, Story County, and Iowa State University, as well as the Boone County Landfill. If you or any of your constituents have questions about this annual report or any of the activities of the Resource Recovery System, please do not hesitate to contact me or Bill Schmitt (515-239-5137).

Sincerely,

A handwritten signature in blue ink that reads 'John C. Joiner'.

John C. Joiner, P.E.
Public Works Director

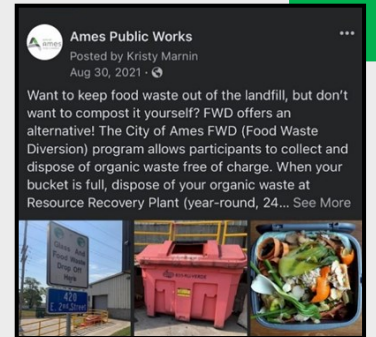
Service Highlights & Objectives

System Improvements Update

- Resource Recovery staff continues to work towards continuous improvements by implementing new and sustainable technologies within the facility and operations to maximize landfill diversion. Continuous improvements include replacing the rotor on the Primary shredder, rollers along with chains, sprockets, and bearings on the Primary and Secondary disc screens. The Primary disc screen has 13 rollers; and the Secondary disc screen has 7 rollers. These continuous improvements allow us to maximize the recovery of refuse derived fuel (RDF) and reduce the amount of material going to the landfill while continuing to send the highest quality RDF to the Power Plant.

Program Updates

- Participation in the Food Waste Diversion (FWD) has continued to dramatically increase. Since our pilot FWD program started in 2019, over **180,880 pounds** have been composted.
- A total of **416,520 pounds** of Household Hazardous Materials have been diverted from the landfill and properly recycled and disposed of since collection started in 1998.
- The Great Pumpkin Disposal program has continued to increase in popularity and has been a fun way to collect pumpkins, gourds, and other vegetable décor. Over **70,780 pounds** of pumpkins have been used since 2017 to feed local farm animals, some were first used by Iowa State's Student Government sponsored pumpkin-smashing event for stress relief, and the remainder went to be composted.



- Over **82,887 tons** of ferrous and non-ferrous metal have been recycled from 1976-2022 rather than being landfilled. This is enough metal to manufacture the steel components needed to make approximately 385 wind turbines.
- The City of Ames offers four no-charge yard waste days for residential drop off in the fall and spring. This past year, **549 tons** of yard and tree waste was collected and reused.
- Our waste oil collection efforts have allowed the waste oil to be turned into bituminous material for asphalt roads or refined to create new oil for consumer use.
- The glass recycling program set a record in 2022 with **256 tons** recycled. The glass is processed into usable materials for remanufacturing new glass, fiberglass insulation, and other items.

- A total of **943 tires** were collected for recycling in 2022. The recycled materials are broken down to make rubber mulch, rubberized flooring, and athletic surfaces.

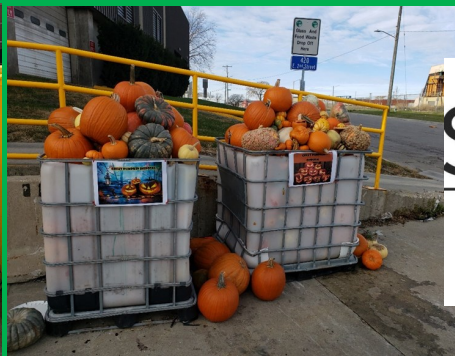
Service Highlights & Objectives

Program Updates, continued

- Resource Recovery staff has been monitoring and maintaining the City of Ames Sanitary Landfill in accordance with the Iowa Department of Natural Resources (DNR) Municipal Solid Waste Landfill permit since its closure in 1996. The City's sanitary landfill has met all requirements, continues to be in stable condition. An environmental easement was approved by the Iowa DNR, and our landfill is only one of a few statewide that has reached this milestone.



- An exciting new pilot program for recycling drop off is currently in the planning stages for implementation later this spring or summer.
- City staff is planning to implement a fee-based electronics recycling program to start in July of this year.
- The City contracted with RRT Design and Construction, a consulting firm, to complete a feasibility study to explore options for the City of Ames to continue being a: reliable, sustainable, and local solid waste disposal facility, by creating a usable energy for the community, and maximize the amount of material diverted from the landfill.
- In alignment with City of Ames sustainability goals, Iowa State University is an active participant in diverting materials from the landfill with their programs for reducing, reusing, recycling, donating, and composting materials.
- Collaborate with ISU for the community Stash the Trash event. Stash the Trash brings students and community members together to clean up areas around the community.
- Partnered with Project Aware to process collected materials from river and stream clean-ups that are not suitable for recycling but can still be recovered for refuse derived fuel.



SMART
TRASH

Service Highlights & Objectives

Resource Recovery System Public Education and Outreach

- The Rummage RAMPage continues to be an amazing event for the community, sustainability efforts and landfill diversion. The City of Ames Resource Recovery facility received recognition and was awarded the [2022 Outstanding Waste Diversion Program](#) by the Iowa Society of Solid Waste Operations at the Solid Waste Management Conference.
- Resource Recovery continues its ongoing mission to educate the public by giving tours of our facilities and operations. Tours are provided for individuals and large groups of all ages. Residents, students, engineering groups and many other communities from around the state, country and world have visited Resource Recovery Plant to see how we process materials that are not recycled into refuse derived fuel. For those that are unable to come to the plant staff will go to the organizations and present at their meetings.
- The City of Ames, in partnership with DNR's Iowa Waste Exchange (IWE) program works to divert material from the landfill. The City of Ames works with citizens, businesses, and other customers to connect them with IWE. IWE then assists clients in saving disposal and raw material costs through reducing, reusing, recycling, and renewing materials.
- Resource Recovery has worked to increase social media presence and engagement. The City of Ames – Government and also the Ames Public Works social media pages offer a great way to share plant and program information in a timely way. Additionally, these outlets have provided another opportunity to engage with residents.



MATERIALS, REVENUES & EXPENSES

RESOURCE RECOVERY SYSTEM

Year	Total Refuse (Tons)	*Refuse Not Processed (Tons)	Refuse Processed (Tons)	% of Total Processed	Metals (Tons)	Glass (Tons)	RDF (Tons)	RDF (% of Processed)	% Total Diverted	Revenue	Expense
2003 CY	51,906	4,770	47,136	91%	1,678	0	33,146	70%	74%	\$3,803,639	\$3,527,346
2004 CY	53,788	2,762	51,026	95%	2,332	0	34,334	67%	72%	\$4,017,107	\$3,462,794
2005 CY	54,493	1,025	53,468	98%	2,250	0	32,621	61%	65%	\$4,285,110	\$3,716,566
**2006 CY	55,500	4,511	50,989	92%	2,229	54	30,180	59%	64%	\$4,250,337	\$4,449,985
2007 CY	57,333	4,513	52,820	92%	2,102	96	34,182	65%	69%	\$4,392,686	\$4,531,663
2008 CY	57,470	4,754	52,716	92%	2,068	115	36,060	68%	73%	\$4,632,493	\$3,725,904
2009 CY	53,395	6,748	46,647	87%	1,987	130	31,040	67%	71%	\$3,956,279	\$5,507,045
2010 CY	58,756	1,262	57,494	98%	2,347	129	37,865	66%	70%	\$4,937,018	\$4,605,121
2011 CY	55,270	4,659	50,611	92%	2,166	150	34,422	68%	73%	\$4,697,573	\$3,729,248
2012 CY	53,106	3,725	49,381	93%	2,177	145	32,329	65%	70%	\$4,641,704	\$4,089,447
2013 CY	54,159	10,066	44,093	81%	1,873	171	28,262	64%	69%	\$4,062,010	\$4,196,226
2014 CY	55,698	8,204	47,494	85%	2,104	173	29,595	62%	67%	\$4,501,455	\$4,555,974
***2015 CY	54,394	6,641	47,753	88%	2,201	177	25,194	53%	58%	\$4,205,529	\$4,342,664
2016 CY	52,210	8,953	43,257	83%	1,947	159	24,135	56%	61%	\$3,818,109	\$4,086,378
2017 CY	51,254	7,997	43,257	84%	1,804	131	21,005	49%	53%	\$3,650,063	\$4,545,420
****2018 CY	52,863	19,087	33,669	64%	1,199	149	15,656	46%	51%	\$3,300,699	\$4,383,878
*****2019 CY	53,684	32,030	21,554	40%	759	191	12,475	58%	62%	\$3,289,071	\$3,785,963
2020CY	50,061	9,622	40,162	80%	1,419	246	23,486	58%	63%	\$4,265,167	\$4,120,399
2021 FY	51,223	11,053	40,040	78%	1,307	256	23,598	59%	63%	\$4,514,203	\$4,254,055
2022 FY	52,561	9,471	43,096	82%	1,459	250	27,979	65%	69%	\$4,718,211	\$4,016,792
20 Years	1,079,124	161,853	916,663	85%	37,408	2,721	567,564	62%	66%	83,938,463	83,632,869

*Reflects tons to Boone County Landfill from planned and unplanned shut downs, and non-beneficial MSW

** Closed for one month for air knife installation ***Closed for 6 weeks for power plant upgrades

**** Power Plant off for repairs for 164 days

***** Power Plant off for repairs for 227 days

CITY OF AMES, IOWA
RESOURCE RECOVERY SYSTEM
System Summary Fiscal Year 2022

	2020/21	2021/22	2022/23	2023/24
Service Accomplishments:	Actual	Actual	Adjusted	Projected
Tons of refuse available	51,223	52,561	52,600	53,500
Tons of refuse diverted to Boone landfill	11,053	8,221	4,000	3,300
Tons of refuse processed	40,040	43,096	46,000	48,000
Tons of RDF to Electric Utility	23,598	27,979	30,500	31,500
Tons of glass recycled	256	250	255	265
Tons of metal recycled	1,307	1,459	1,550	1,600
Pounds of HHM* collected	25,716	28,454	28,000	28,500
ISU tons into plant	2,241	2,935	2,850	2,800
Pounds diverted from landfill to Rummage RAMPage	0	92,126	143,838	150,000
Pounds of Organics Diverted	27,306	87,060	120,000	145,000
Average # of vehicles/free yard waste day	624	641	630	635
Efficiency and Effectiveness:				
% of available materials processed	78%	85%	91%	93%
Reject disposal rate/ton (Boone County)	\$52.00	\$52.00	\$54.00	\$ 58.00
% of processed materials that are sent to the landfill as rejects	34%	32%	30%	28%
Reject transportation rate/ton	\$14.63	\$15.15	\$15.68	\$ 16.23

* Household Hazardous Materials

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CITY OF AMES, IOWA
RESOURCE RECOVERY SYSTEM FUND
For Fiscal Year 2022

REVENUES:

Per Capita	\$912,170	
Refuse Derived Fuel-Electric	\$946,051	
Sale of Metals	\$317,846	
Public Fees	\$93,980	
Regular Customers	\$2,355,087	
Bond Proceeds / Misc. Revenue	\$422,412	
Other Governmental Agencies	\$8,016	
I.S.U. Solid Waste Share	\$258,777	
Interest Revenue	\$(3,644)	
Damage Claims		
		\$5,310,695

EXPENSES:

Operations	\$4,172,470	
Debt Service	\$644,552	
		\$4,817,022

Net Income/Expense	\$493,673
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CITY OF AMES, IOWA RESOURCE RECOVERY SYSTEM

POPULATION - PERCENTAGES - CHARGES

Annual Billing - Calendar 2017 at \$9.10

Annual Billing - Calendar 2019 at \$10.50

	Population	Percent of Population	Per Capita Charge
Ames	56,427	64.93%	\$592,484
Story County	8,965	10.32%	\$94,133
Nevada	6,925	7.97%	\$72,713
Story City	4,244	4.88%	\$44,562
Huxley	3,352	3.86%	\$35,196
Slater	1,543	1.78%	\$16,202
Roland	1,362	1.57%	\$14,301
Gilbert	1,211	1.39%	\$12,716
Maxwell	859	0.99%	\$9,020
Cambridge	827	0.95%	\$8,684
Zearing	528	0.61%	\$5,544
McCallsburg	353	0.41%	\$3,707
Kelley	304	0.35%	\$3,192
TOTALS	86,900	100.00%	\$912,450

Based on 2020
U.S. Census
Ames is 66,427 minus I.S.U. 10,000

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PUBLIC WORKS

CITY OF AMES, IOWA
RESOURCE RECOVERY PLANT VOLUMES
For Fiscal Year 2022

Generator	2022 TRIPS	2022 WEIGHT	PERCENT OF TOTAL WEIGHT
Non-Scale Refuse (Car line)	5,012	1,327	2.5%
Commercial Haulers/ Contractors/Govt	8,222	40,053	76.2%
Iowa State University	785	2,935	5.6%
Directly to Boone	1,420	8,221	15.6%
TOTALS	15,439	52,536	100.0%

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CITY OF AMES, IOWA RESOURCE RECOVERY SYSTEM FEE SCHEDULE

YEAR	PER CAPITA	TIPPING FEE	CARLINE	
			CARS	PICKUPS
2002/03	\$11.75	\$52.75/TON	\$8.00	\$22.00
2003/04	\$10.50	\$52.75/TON	\$8.00	\$22.00
2004/05	\$10.50	\$52.75/TON	\$8.00	\$22.00
2005/06	\$10.50	\$52.75/TON	\$8.00	\$22.00
2006/07	\$10.50	\$52.75/TON	\$8.00	\$22.00
2007/08	\$10.50	\$52.75/TON	\$8.00	\$22.00
2008/09	\$10.50	\$52.75/TON	\$8.00	\$22.00
2009/10	\$10.50	\$52.75/TON	\$8.00	\$22.00
2010/11	\$10.50	\$52.75/TON	\$8.00	\$22.00
2011/12	\$9.10	\$52.75/TON	\$8.00	\$22.00
2012/13	\$9.10	\$52.75/TON	\$8.00	\$22.00
2013/14	\$9.10	\$52.75/TON	\$8.00	\$22.00
2014/15	\$9.10	\$52.75/TON	\$8.00	\$22.00
2015/16	\$9.10	\$52.75/TON	\$8.00	\$22.00
2016/17	\$9.10	\$52.75/TON	\$8.00	\$22.00
2017/18	\$9.10 / \$10.50	\$55.00/TON	\$10.00	\$25.00
2018/19	\$10.50	\$55.00/TON	\$10.00	\$25.00
2019/20	\$10.50	\$58.75/TON	\$10.00	\$25.00
2020/21	\$10.50	\$58.75/TON	\$10.00	\$25.00
2021/22	\$10.50	\$58.75/TON	\$10.00	\$25.00
2022/23	\$10.50	\$62.50/TON	\$10.00	\$25.00

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