

ITEM#: 13
DATE: 02-22-22

COUNCIL ACTION FORM

SUBJECT: 2021 RESOURCE RECOVERY SYSTEM ANNUAL REPORT

BACKGROUND:

The previous year proved to be very challenging with the continuing effects of COVID-19 and the completion of major improvements at the Ames Power Plant. Federal requirements dictating the amount of RDF that can be fired along with completing the Power Plant maintenance activities led to a temporary increase in the amount of rejects being processed and hauled.

However, through these challenges, the Resource Recovery System (RRS) continues to be a very effective method for waste management and landfill diversion. With 51,223 tons of municipal solid waste (MSW) generated within the partner communities and agencies during 2021, approximately 40,040 tons were received at the plant and processed to create 23,598 tons of Refuse Derived Fuel (RDF). An estimated 1,307 tons of metal and 256 tons of glass were recovered for recycling. Additional items diverted from the landfill included almost 13 tons of Household Hazardous Materials, 15 tons of organics and 6.4 tons of pumpkins from the Great Pumpkin Disposal Program. Fortunately, we were able to hold Rummage RAMPage once again in 2021, finding new uses and homes for approximately 100,000 pounds of household items that would have otherwise been destined for the landfill.

As mentioned, major improvements to the Power Plant boilers that began in 2019 were completed in the fall of 2020. This will enhance the capacity of co-firing RDF and allow increased efficiency of the Resource Recovery plant. This will also provide redundancy and resilience for the haulers and other customers. Revenues from all sources totaled \$4,514,203 and total expenses were \$4,254,055. This resulted in a net increase of \$260,148 to the Resource Recovery fund for fiscal year 2021. 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 will be raised to \$62.50 beginning July 1, 2022.

ALTERNATIVES:

1. Accept the 2021 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 will increase the efficiency and capacity of utilizing RDF. The redundancy achieved by completing these major improvements in both Power Plant boilers will result in enhanced and more consistent service for the haulers and other customers.

The study to evaluate alternatives for optimizing the Waste-to-Energy process is scheduled to be completed and presented to the City Council in spring of 2022. This shared study between Resource Recovery and Electric Services could lead to significant changes that improve the solid waste handling and energy production systems.

City Council acceptance of this report will allow staff to bill our participating partners for their respective per capita fees for the Resource Recovery System.

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



ANNUAL REPORT 2021

ARNOLD O. CHANTLAND— RESOURCE RECOVERY SYSTEM

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CITY OF
Ames[™]
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

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February 11, 2022

Dear Resource Recovery System Members:

The previous year proved to be very challenging with the continuing effects of COVID-19 and the completion of major improvements at the Ames Power Plant. Federal requirements dictating the amount of RDF that can be fired along with completing the Power Plant maintenance activities led to a temporary increase in the amount of rejects being processed and hauled.

However, through these challenges, the Resource Recovery System (RRS) continues to be a very effective method for waste management and landfill diversion. With 51,223 tons of municipal solid waste (MSW) generated within the partner communities and agencies during 2021, approximately 40,040 tons were received at the plant and processed to create 23,598 tons of Refuse Derived Fuel (RDF). An estimated 1,307 tons of metal and 256 tons of glass were recovered for recycling. Additional items diverted from the landfill included almost 13 tons of Household Hazardous Materials, 15 tons of organics and 6.4 tons of pumpkins from the Great Pumpkin Disposal Program. Fortunately, we were able to hold Rummage RAMPage once again in 2021, finding new uses and homes for approximately 100,000 pounds of household items that would have otherwise been destined for the landfill.

After completing a Greenhouse Gas Inventory in 2020, the City of Ames is currently in the process of developing a customized Ames Climate Action Plan (CAP). Since the beginning of RRS operations in 1975, it has been an effective, efficient, and environmentally focused waste management system for all the member agencies. This has been accomplished by diverting material from the landfill and using it in place of fossil fuels to generate electricity. Since 1975 the RRS has diverted 1,370,177 tons of RDF from the landfill, recycled 81,669 tons of metal, recycled 2,472 tons of glass, composted 48 tons of organics, and 215 tons of usable material from the landfill with Rummage RAMPage. Just in 2021 the 23,598 tons of RDF produced by RRS reduced carbon emissions by 9,675 tons versus landfilling. This carbon reduction is the equivalent to the emissions from over 1,900 cars. RRS continues to be a responsible, sustainable, local solution for waste from our member agencies.

As mentioned, major improvements to the Power Plant boilers that began in 2019 were completed in the fall of 2020. This will enhance the capacity of co-firing RDF and allow increased efficiency of the Resource Recovery Plant (RRP). This will also provide redundancy and resilience for the haulers and other customers. Revenues from all sources totaled \$4,514,203 and total expenses were \$4,254,055. This resulted in a net increase of \$260,148 to the Resource Recovery fund for fiscal year 2021. 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 will be raised to \$62.50 beginning July 1, 2022.

The study to evaluate alternatives for optimizing the Waste-to-Energy process is scheduled to be completed and presented to the City Council in spring of 2022. This is a shared study between Resource Recovery and Electric Services that could lead to significant changes that improve the solid waste handling and energy production systems.

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,

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

Public Works Department
Administration

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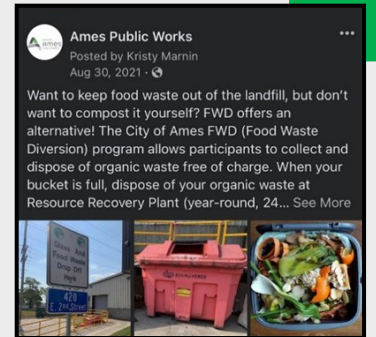
Service Highlights & Objectives

System Improvements Update

- Resource Recovery staff continues to work on recommendations from the consultant's report on landfill diversion. Continuous improvements include replacing conveyor belts C-2 and C-3A. The C-2 conveyor belt is 72 inches wide and 81 feet long; and the C-3A conveyor belt is 72 inches wide and 112 feet long. These continuous improvements allow us to maximize the recovery of 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 program has increased dramatically with 32 tons diverted from the landfill in 2021. Two trial runs of transporting food waste to the Water and Pollution Control plant were performed and successfully run through the anaerobic digester. Staff from RRP is working with staff from WPC to facilitate this method of organic disposal and methane recovery.**



- The glass recycling program set a record in 2021 with 256 tons recycled.
- The Great Pumpkin Disposal Program netted more than six tons destined for composting rather than the landfill.
- Over 1,284 tons of metal was recycled from the waste stream rather than being landfilled. In 46 years, 81,669 tons of metal have been diverted from landfill and recycled. Additionally, after six years of low pricing the metals market has noticed a partial recovery.

Resource Recovery System Public Education and Outreach



- 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.

- Sustainapalooza at Iowa State in the Memorial Union offers a great way to network with other sustainability leaders from campus and the Ames community; Resource Recovery featured the Food Waste Diversion program at the 2021 event.

- A new video was created for use with virtual audiences in mind during the pandemic to explain what happens at RRP.

- Resource Recovery staff followed IDPH and CDC guidelines to minimize risk to our employees and customers while still providing excellent customer

service. Regular reminders at staff and safety meetings help keep everyone informed and up to date on City policies.

Service Highlights & Objectives

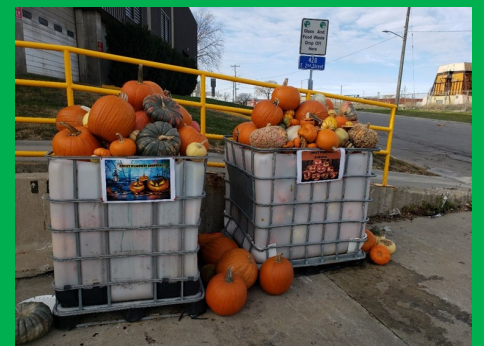
Resource Recovery System Public Education and Outreach, cont'd

- RRP is working in cooperation with Ames Municipal Electric Services and a consultant to analyze how we can maximize diversion from landfill and maximize energy recovery through a Waste to Energy Options Study.



- Early planning meetings have started for Rummage RAMPage 2022. The sixth annual event will begin on Friday, July 29 and run through Saturday, August 6. The event is organized by the City of Ames and Iowa State University and staffed with volunteers from non-profit organizations. Proceeds from the sales are divided amongst the volunteer organizations.

- **In five years, the event has diverted more than 430,000 pounds of furniture and household items from the landfill. Rummage RAMPage would not be possible without the donations from the citizens, the buyers, and the fantastic volunteers!**
- Household Hazardous Material (HHM) drop-off appointments are now available on Saturday mornings, as well as Wednesday afternoons. An additional day was added as a convenience option for customers, to improve customer service, and remove HHM from the waste stream.
- Primary Shredder: Staff worked with organizations that utilize the same brand shredder to source parts to replace the rotor teeth and countercomb teeth that perform the shredding action. These teeth are integral to the operation of the shredder to give proper sizing and shredding of the waste. By utilizing this alternative vendor, RRP can reduce the replacement cost for the teeth by 60%!
- The Primary shredder is operated with an advanced hydraulic system that can switch from a high speed/low torque to a low speed/high torque operation automatically depending on the internal fluid pressures in the hydraulic system. These specialized hydraulic drive motors are necessary for the operation of the shredder, and they are expensive. RRP staff has worked with local suppliers and vendors to identify a company in Des Moines that can rebuild these hydraulic motors in house at a significant savings.



**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
2002 CY	50,267	1,550	48,717	97%	1,258	0	35,147	72%	75%	\$3,731,348	\$3,110,513
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	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
20 Years	1,076,830	153,932	922,284	86%	37,207	2,472	574,732	62%	67%	82,951,600	82,726,590

*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 REPORT

	2019/20	2020/21	2021/22	2022/23
Service Accomplishments:	Actual	Actual	Adjusted	Projected
Tons of refuse available	51,749	51,223	52,000	52,500
Tons of refuse diverted to Boone landfill	17,970	11,053	9,000	7,000
Tons of refuse processed	33,511	40,040	42,000	44,000
Tons of RDF to Electric Utility	17,217	23,598	29,000	30,500
Tons of glass recycled	215	256	265	280
Tons of metal recycled	1,056	1,307	1,800	2,000
Pounds of HHM* collected	26,420	25,716	27,000	27,000
ISU tons into plant	2,156	2,241	2,300	2,250
Pounds diverted from landfill to Rum- mage RAMP	116,424	0	92,126	105,000
Pounds of Organics Diverted	1,947	27,306	35,000	45,000
Average # of vehicles/free yard waste	638	624	532	575
Efficiency and Effectiveness:				
% of available materials processed	67%	78%	85%	88%
Reject disposal rate/ton (Boone County)	\$52.00	\$52.00	\$52.00	\$ 55.00
% of processed materials that are sent to the landfill as rejects	45%	34%	27%	26%
Reject transportation rate/ton	\$14.14	\$14.63	\$15.15	\$ 16.00
Average cost/user free yard waste day	\$7.24	\$7.05	\$10.22	\$ 9.46
* Household Hazardous Materials				

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**CITY OF AMES, IOWA
RESOURCE RECOVERY SYSTEM
ANNUAL BILLING**

**Participating Communities
For Fiscal Year 2021**

REVENUES:

Per Capita	\$	870,008	
Refuse Derived Fuel-Electric	\$	976,964	
Sale of Metals	\$	227,736	
Public Fees	\$	84,603	
Regular Customers Reimbursements and Refunds	\$	2,153,503	
Other Governmental Agencies	\$	5	
I.S.U. Solid Waste Share	\$	197,211	
Interest Revenue	\$	(2,637)	
Damage Claims	\$	-	
			\$ 4,514,203

EXPENSES:

Operations	\$	4,093,668	
Debt Service	\$	160,387	
			\$ 4,254,055

Net Income/Expense **\$ 260,148**

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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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CITY OF AMES, IOWA
RESOURCE RECOVERY PLANT VOLUMES
For Fiscal Year 2021

Generator	2021 TRIPS	2021 WEIGHT	PERCENT OF TOTAL WEIGHT
Non-Scale Refuse (Car line)	5,577	1,185	2.3%
Commercial Haulers	7,460	36,230	71.5%
Private Industry/Contractors	536	442	0.9%
City of Ames	38	44	0.1%
Iowa State University	635	2,241	4.4%
Iowa Dept. of Transportation	-	-	0.0%
U.S.D.A. Lab	46	73	0.1%
Directly to Boone	1,981	10,454	20.6%
TOTALS	16,273	50,669	100.0%

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CITY OF
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 PUBLIC WORKS

CITY OF AMES, IOWA
RESOURCE RECOVERY SYSTEM
FEE SCHEDULE

YEAR	PER CAPITA	TIPPING	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
	\$10.50	\$52.75/TON	\$8.00	\$22.00
	\$10.50	\$52.75/TON	\$8.00	\$22.00
	\$10.50	\$52.75/TON	\$8.00	\$22.00
	\$10.50	\$52.75/TON	\$8.00	\$22.00
	\$10.50	\$52.75/TON	\$8.00	\$22.00
	\$9.10	\$52.75/TON	\$8.00	\$22.00
	\$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
Proposed 2022/23	\$10.50	\$62.50/TON	\$10.00	\$25.00

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