

# Memorandum

Date: Monday, June 14, 2021

Project: Long-Term Waste Management (LTWM) System Evaluation

To: Cedar Rapids Linn County Solid Waste Agency (CRLCSWA)  
Karmin McShane, Executive Director

From: HDR Engineering, Inc. (HDR)  
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Subject: Task 1 - **Summary of Waste Volumes and Projections**

## Introduction

The purpose of this memorandum is to assist the Cedar Rapids Linn County Solid Waste Agency (CRLCSWA) in quantifying the volume and types of waste currently managed in the region, develop waste generation per capita rates for waste types, and provide a basis to predict future waste handling infrastructure needs based on these waste types and volumes. Individual solid waste projections for CRLCSWA, Black Hawk County Solid Waste Management Commission (Black Hawk County), City of Iowa City Landfill and Recycling Center (Iowa City), and Dubuque Metropolitan Area Solid Waste Agency (Dubuque) will be provided as background for consideration of potential cooperative opportunities.

Population projections are used to calculate waste generation and provide guidance to determine waste stream capture rates and market demands.

Tonnage information in this memorandum is provided by fiscal year (FY), which is July 1 to June 30 each year, coinciding with the Iowa Department of Natural Resources solid waste reporting requirements.

## Detailed Solid Waste Volumes

HDR recognizes that based on the East Central Iowa Council of Governments' *Regional Comprehensive Integrated Solid Waste Management Plan 2016-2026*, the regional waste stream is comprised of approximately 30 percent residentially generated waste and 70 percent commercially generated waste. For analysis purposes, the municipal solid waste (MSW) stream combines both residentially and commercially generated wastes. This allows the median tonnage and population census to be used to calculate future tonnage volumes, as shown in Table 1. This is the same methodology the US Environmental Protection Agency (EPA) incorporates to characterize the MSW stream at the national level.

Table 1 summarizes detailed solid waste volumes received at CRLCSWA facilities and the City of Cedar Rapids curbside recycling program, by source and type, based on tonnage information received from CRLCSWA. The waste stream included in the following tables also accounts for debris managed from natural disasters, including tornadoes, floods, fires, and winter storms.

**Table 1 – Detailed Solid Waste Volumes – CRLCSWA Facilities<sup>1</sup> (In Tons)**

CRLCSWA Facilities Waste Stream (In Tons)		Fiscal Year <sup>2</sup>			
		FY2017	FY2018	FY2019	FY2020
<b>Solid Waste</b>	MSW	149,886	153,468	167,404	160,086
	Disaster Debris	934	0	0	0
	Special Waste	19,320	15,118	21,253	16,612
	C&D	13,498	11,937	12,337	25,960
	Shingles	323	491	1,309	9,091
<b>Total Disposed – Landfill</b>		<b>183,961</b>	<b>181,014</b>	<b>202,303</b>	<b>211,749</b>
<b>Organics</b>	Organics	35,376	30,298	28,781	29,710
	<b>Subtotal</b>	<b>35,376</b>	<b>30,298</b>	<b>28,781</b>	<b>29,710</b>
<b>Recyclables</b>	Glass	587	613	625	601
	OCC	452	403	451	536
	Single Stream Sort	4,143	2,422	2,978	2,389
	City of Cedar Rapids <sup>3</sup>	8,163	8,061	8,170	8,346
	Metal	437	517	480	454
	White Goods	531	538	521	422
	<b>Subtotal</b>	<b>14,313</b>	<b>12,554</b>	<b>13,225</b>	<b>12,748</b>
<b>Total Recycled/Recovered</b>		<b>49,689</b>	<b>42,852</b>	<b>42,006</b>	<b>42,458</b>
<b>Total Materials to Facilities</b>		<b>233,650</b>	<b>223,866</b>	<b>244,309</b>	<b>254,207</b>

<sup>1</sup>Includes Site 2 and Site 3 waste receipts, as well as City of Cedar Rapids recyclables volumes managed by Republic Services MRF.

<sup>2</sup>CRLCSWA Fiscal Year period is July 1 to June 30.

<sup>3</sup>The City of Cedar Rapids began taking curbside recyclables to Republic Services MRF in 2016. These volumes are included in the totals above but are not managed by CRLCSWA.

## CRLCSWA Per Capita Waste Generation Rates

The primary purpose of the per-capita waste generation measurement is to forecast waste generation volumes for use in evaluating future programs and infrastructure development options. Table 2 summarizes the per capita generation rate, in tons per year and pounds per day, based on population by waste stream.

**Table 2 – CRLCSWA Annual Per Capita Waste Generation Rates (In Tons)**

	FY2017	FY2018	FY2019	FY2020	4-Year Median
<b>Linn County Population<sup>1</sup></b>	<b>224,380</b>	<b>225,770</b>	<b>226,700</b>	<b>228,600</b>	<b>N/A</b>
<b>Material Disposed (in tons/yr per capita)</b>					
<b>MSW</b>	0.67	0.68	0.74	0.70	0.70
<b>Disaster Debris</b>	0.01	0.00	0.00	0.00	0.01 <sup>2</sup>
<b>Special Waste</b>	0.09	0.07	0.09	0.07	0.08
<b>C &amp; D</b>	0.06	0.05	0.05	0.11	0.07
<b>Shingles</b>	0.00	0.00	0.01	0.04	0.01
<b>Materials Recycled/Recovered (in tons/yr per capita)</b>					
<b>Organics</b>	0.16	0.13	0.13	0.13	0.14
<b>Single Stream/Drop Box/City</b>	0.06	0.05	0.05	0.05	0.05
<b>Scrap Metal/White Goods</b>	0.01	0.01	0.01	0.01	0.01
<b>Total Annual Per Capita Generation Rate (in tons)</b>	<b>1.06</b>	<b>0.99</b>	<b>1.08</b>	<b>1.11</b>	<b>1.06</b>
<b>Total Annual Per Capita Generation Rate (in lbs/day)</b>	<b>5.71</b>	<b>5.43</b>	<b>5.90</b>	<b>6.10</b>	<b>5.79</b>
<b>Total Annual Per Capita Disposal Rate (in tons)</b>	<b>0.82</b>	<b>0.80</b>	<b>0.89</b>	<b>0.92</b>	<b>0.87</b>
<b>Total Annual Per Capita Disposal Rate (in lbs/day)</b>	<b>4.49</b>	<b>4.38</b>	<b>4.88</b>	<b>5.10</b>	<b>4.77</b>
<b>Total Annual Per Capita Disposal Rate (in lbs/yr)</b>	<b>1,638.85</b>	<b>1,598.70</b>	<b>1,781.20</b>	<b>1,861.50</b>	<b>1,741.05</b>

<sup>1</sup>Population from U.S. Census Bureau.

<sup>2</sup>Conservative estimate utilized in 4-year average.

Table 2 is used to determine the individual per capita rates for waste disposal and recycling. As such, the waste disposal per capita 4-year average rate for CRLCSWA was calculated to be 0.87 ton per person, per year, while the recycling per capita 3-year average rate is 0.20 ton per person, per year. Tonnages recycled outside of CRLCSWA are not included in Table 2. In addition, household hazardous waste and brown goods have not been included while calculating the recycling rate.

## Disposal Per Capita Comparison

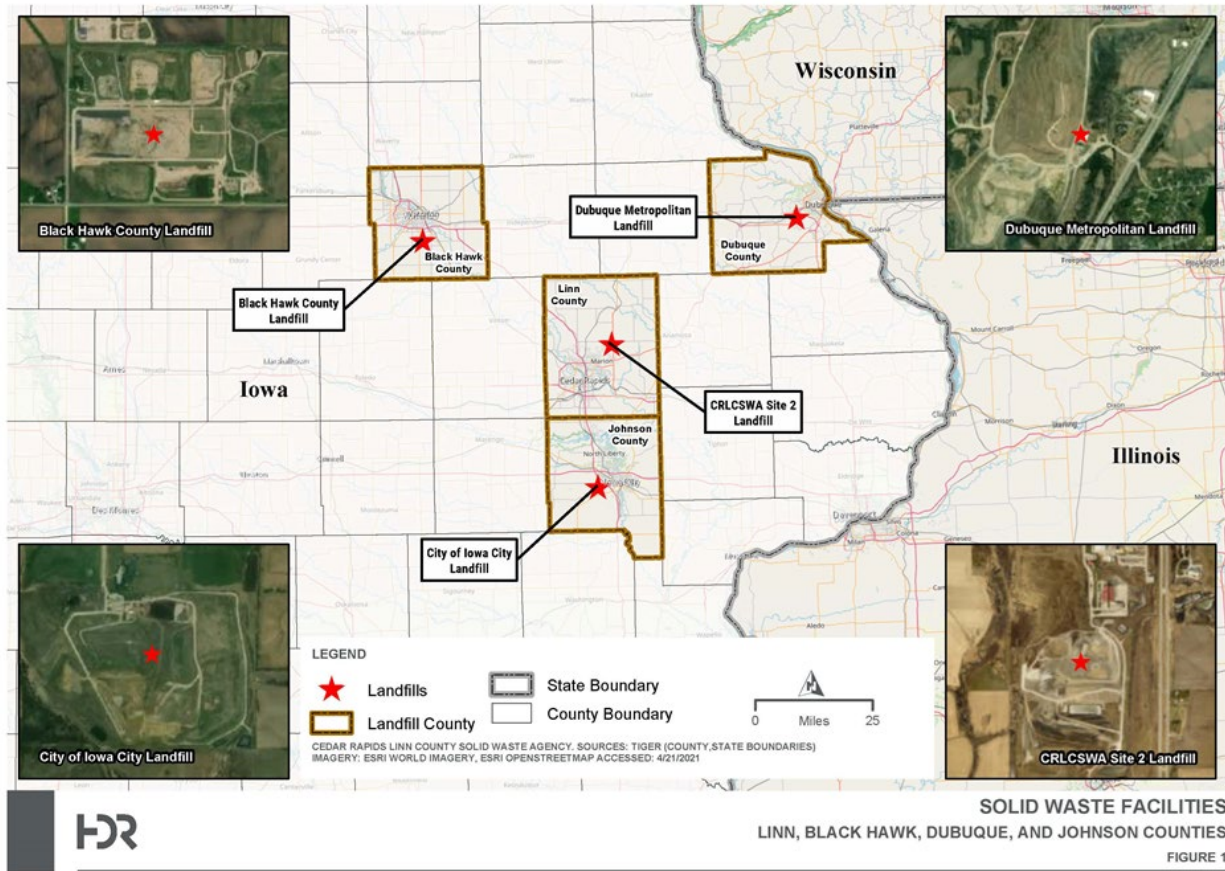
Table 3 provides information for comparison on per capita generation rates in tons per person, per year, based on population by waste stream for CRLCSWA, Black Hawk County, Dubuque, and Iowa City. Fiscal year 2019 was used for comparison as that is the most recent disposal volume data available for the comparison locations.

Table 3 – Disposal Per Capita Comparison (FY2019)				
	CRLCSWA Site 2 Landfill	Black Hawk County Landfill	Dubuque Metropolitan Landfill	Iowa City Landfill
<b>Population Served</b>	<b>226,700</b>	<b>186,990</b>	<b>151,520</b>	<b>154,775</b>
<b>MSW (In Tons)</b>	202,303	189,064	145,420	127,587
<b>Total Annual Per Capita Disposal Rate (In Tons)</b>	<b>0.89</b>	<b>1.01</b>	<b>0.96</b>	<b>0.82</b>

Sources: Population projections - Woods and Poole Economics, Inc. Historical tonnage information – Iowa Department of Natural Resources, Solid Waste Section, Historical Landfill tonnages. Available at: <https://www.iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste#:~:text=lowans%20generate%202.8%20million%20tons,managed%20by%20cities%20and%20counties>.

Figure 1 presents location of landfill sites used for comparison purposes.

**Figure 1 – Disposal per Capita Comparison Landfill Sites**



For comparison purposes, the Black Hawk County Service Area includes:

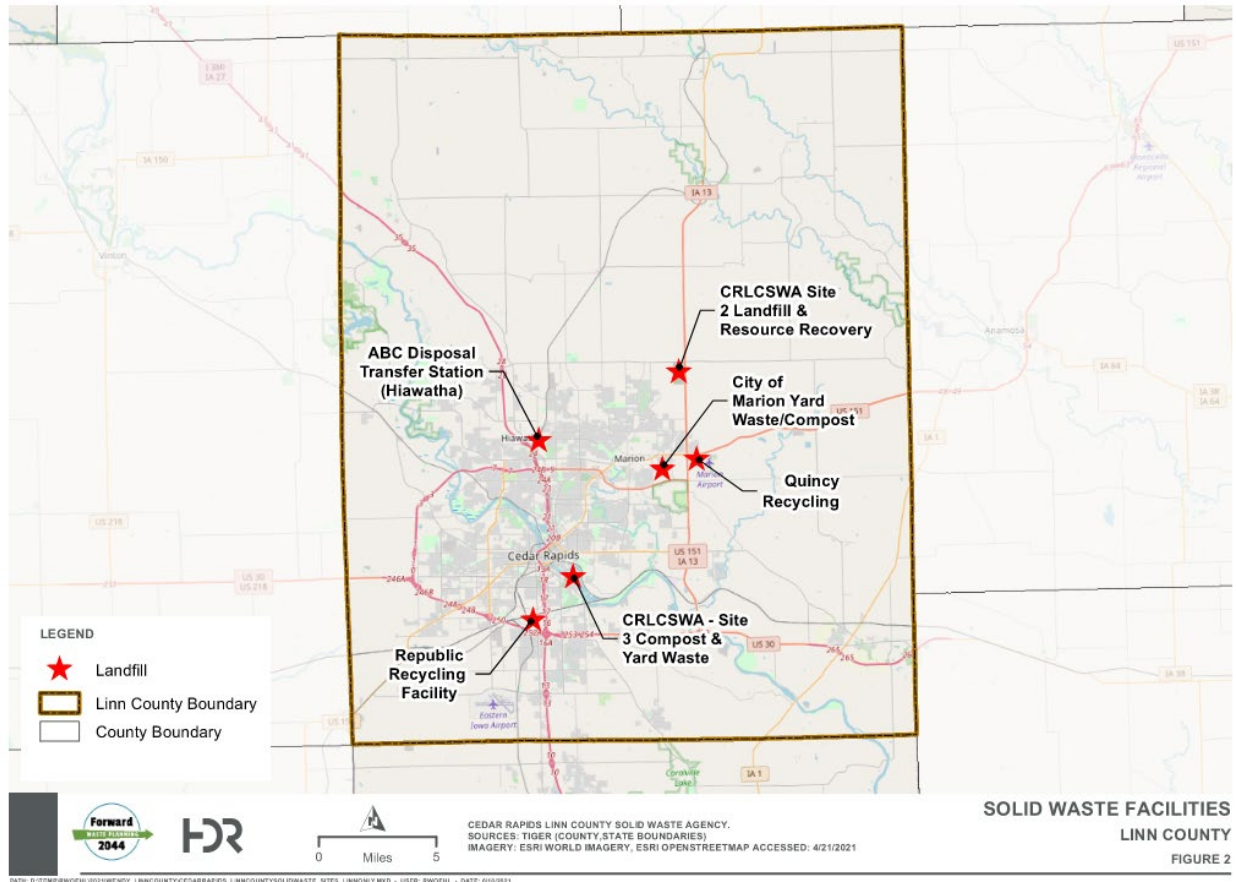
- All cities and the unincorporated area in Black Hawk County
- All cities and the unincorporated area in Bremer County
- All cities and the unincorporated area in Fayette County
- Within the cities of Jesup and Fairbank in Buchanan County
- Within the cities of Dike, Grundy Center, Morrison, Reinbeck, and Stout in Grundy County

Dubuque Metropolitan Landfill is a regional facility that services not only Dubuque County but also Delaware County, portions of Jackson and Clayton Counties, Grant County in Wisconsin, and Jo Daviess County in Illinois.

The Iowa City Landfill and Recycling Center serves Kalona, Riverside, and Johnson County in Iowa.

Figure 2 presents the locations of waste management and recycling facilities in Linn County.

**Figure 2 – Solid Waste Facilities in Linn County**



Waste management facilities in Linn County include the following:

- CRLCSWA – Site 2 Landfill and Resource Recovery Center
- CRLCSWA – Site 3 Compost and Yard Waste Facility
- ABC Disposal – Transfer Station
- Quincy – Material Recycling Facility
- Republic – Material Recycling Facility
- City of Marion – Yard Waste Drop Off Facility

## Material-Handling Projections

Material-handling projections are presented in Table 4. Material-handling projections for years 2030, 2040, and 2050 are calculated using the CRLCSWA annual per capita waste-generation rate 4-year average, as shown in Table 2, and the associated population projections. Population projections are calculated using the Woods and Poole Economics, Inc., projections 2025 through 2040 for an average of 0.8 percent per year and extrapolated to 2050. The 2050 population projection is not currently available.

**Table 4 – CRLCSWA Material Handling Projections (In Tons)**

Material	Fiscal Year			
	FY2020	FY2030 <sup>1</sup>	FY2040 <sup>1</sup>	FY2050 <sup>1</sup>
<b>Population</b>	<b>228,600</b>	<b>254,900<sup>2</sup></b>	<b>276,800<sup>2</sup></b>	<b>298,900</b>
<b>Materials Landfilled</b>				
MSW	160,086	178,430	193,760	209,230
Disaster Debris	0	2,549 <sup>3</sup>	2,768 <sup>3</sup>	2,989 <sup>3</sup>
Special Waste	16,612	20,392	22,144	23,912
C&D	25,960	17,843	19,376	20,923
Shingles	9,091	2,549	2,768	2,989
<b>Subtotal Materials Landfilled</b>	<b>211,749</b>	<b>221,763</b>	<b>240,816</b>	<b>260,043</b>
<b>Materials Recycled</b>				
Organics	29,710	35,686	38,752	41,846
Single Stream/Drop Box/City	11,872	12,745	13,840	14,945
Scrap Metal/White Goods	876	1,098	1,193	1,288
<b>Subtotal Materials Recycled</b>	<b>42,458</b>	<b>49,529</b>	<b>53,785</b>	<b>58,079</b>
<b>Total Materials</b>	<b>254,207</b>	<b>271,292</b>	<b>294,601</b>	<b>318,122</b>

<sup>1</sup> The 4-year average annual per capita waste generation rate in tons is used with population projections for years 2030, 2040, 2050.

<sup>2</sup> Woods and Poole Economic, Inc., population projections.

<sup>3</sup> Conservative estimate derived from 4-year average.

## Considerations

The following are items for CRLCSWA to consider that will assist with quantifying solid waste volumes:

- Disaster Debris** – Disaster debris disposal is occurring on a fluctuating basis and has the potential to significantly affect tonnages handled for disposal. This tonnage fluctuation is not accurately presented in the tables above, as limited disaster debris was handled during the time frame used for this memorandum. This memorandum provides information from FY2017 through FY2020, which ended June 30, 2020. Disaster debris disposal as a result of flooding (2008 and 2016 events), hailstorms, and the August 2020 derecho event can cause tonnage fluctuations in the disposal system that significantly

shorten the life of the landfill. Developing a method for CRLCSWA to measure and account for disaster debris would assist in maintaining consistent data.

- **Recycling Export** – The City of Cedar Rapids is currently exporting recycling to facilities outside CRLCSWA. Establishing a method for tracking recycling exported outside of the service area would assist in maintaining consistent data.
- **Population and Tonnage Projections** – Population and tonnage projections are provided for planning purposes as part of the CRLCSWA Long-Term Waste Management Evaluation. Projections should be reviewed and updated on a yearly basis to maintain accurate material handling tonnage.
- **Waste Stream Changes** – Waste streams continue to change and evolve, not only through material changes but also through service disruptions such as those that occurred due to COVID-19. This memorandum provides information through FY2020, which ended June 30, 2020. As of June 30, 2020, COVID-19 had been prevalent for approximately 4 months, and effects on the waste stream, both disposed and recycled, cannot be fully understood. FY2021 tonnage reviews should be completed and the tables in this report updated to allow for future review of tonnage variances.