Solid Waste Management Plan

Barton County, Kansas

2026

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1. Characteristics of the Planning Area

1.1 Background

The Barton County Solid Waste Management Plan was developed in accordance with Kansas Statute Annotated (K.S.A. 65-3405). The purpose of the plan is to characterize and evaluate the Barton County solid waste management system and to identify recommendations for improving and updating the system to meet projected needs for the 10-year planning period. This Solid Waste Management Plan supersedes a previous management system adopted by the County in September 1972.

1.2 General County Description

Barton County is located in Central Kansas as shown in Figure 1-1. It borders Rush and Pawnee Counties on the West, Russell County on the North, Ellsworth and Rice Counties on the East and Stafford County on the South. The County was organized in 1872 and is approximately 30 miles square. The City of Great Bend is the County seat. There are several communities located in the County. There are two cities of Class II, Great Bend and Hoisington, seven cities of Class III, Ellinwood, Albert, Pawnee Rock, Claflin, Susank, Galatia and Olmitz. In addition, there are the unincorporated cities of Heizer, Beaver, Dundee, and Odin. The incorporated cities comprise approximately 76 percent of the total population. Barton County is a County/Township form of government with 22 political township subdivisions. They are as follows: Albion Township, Beaver Township, Buffalo Township, Cheyenne Township, Clarence Township, Cleveland Township, Comanche Township, Eureka Township, Fairview Township, Grant Township, Great Bend Township, Independent Township, Lakin Township, Liberty Township, Logan Township, North Homestead Township, Pawnee Rock Township, South Bend Township, South Homestead Township, Union Township, Walnut Township and Wheatland Township.

1.3 Economy

Barton County was primarily an agricultural community that relied on economic support from the oil industry. A decline in the price of oil in the mid 1980's combined with a weak farm economy had a significant impact on the economic growth of the community. This can easily be seen by changes in the County's assessed evaluation in Figure 1-2. Oil prices came back in the early part of the late 1990's and early 2000's with a peak in

2008 at $126.33 per barrel. This provided a boost for our economy (even though it fluctuated up and down between $60.00 and $98.00). In 2015, it dropped again dramatically to $41.85 per barrel due to strict regulations on petroleum, causing an all-time low in oil production. Since then, oil prices have slowly been on the rise. The community has been able to stabilize its economy and has rebuilt through growth in the manufacturing industry. The Healthcare and social assistance sector is also a growing area within the county's economy. It is the goal of Barton County to promote the development of a stable, diversified, and dynamic economy offering adequate employment opportunities for all segments of the population.

Table 1-3
Major Barton County Employers

Employer	Business Type	# Of Employees
American Plains Coop Association	Agriculture	100-150
Azria Health Woodhaven	Health Services	50-100
Barton County	County Government	150-225
Barton County Community College	Education	600+
Center for Counseling & Consultation	Health Services	50-100
City of Great Bend	City Government	150-225
Clara Barton Medical Center	Medical Services	250+
Cloud Ceramics/Kansas Brick & Tile	Brick & Tile	50-100
CUNA Mutual Retirement Solutions	Pension Consulting	100-150
Dillons #51	Retail Grocery	100-150
Dillons #3	Retail Grocery	50-100
Doonan Specialized Trailer	Semi-Trailers	50-100
Duke Drilling Co., Inc.	Oilfield	50-100
ElderCare, Inc.	Health Services	50-100
Ellinwood Hospital	Medical Services	100-150
Ellinwood USD 355 School District	Education	50-100
Farmers Bank & Trust	Financial Institution	100-150
FIS	401(k) Retirement Planning	100-150
Fuller Industries	Manufacturing	150-225
Great Bend Feeding, Inc.	Agriculture	50-100
Great Bend Industries	Hydraulic Cylinders	50-100
Great Bend USD 428 School District	Education	600+
Hoisington USD 431 School District	Education	50-100
INA Alert	Security Systems	100-225
Innovative Livestock Services	Ag / Livestock	250+
Kansas State University Global Campus	Education	50-100
KWM Loaders	Manufacturing (Loaders)	150-225
Marmie Auto Group	Auto Sales & Service	50-100
McDonalds of Great Bend	Fast Food	50-100
Medicalodges Great Bend	Health Services	50-100
Midwest Energy, Inc.	Utility	50-100

Miller's of Claflin	Home Furnishing	50-100
Pathways ResCare Kansas	Developmental Services	50-100
Perkins Family Restaurant	Restaurant	50-100
QS Nurses	Health Services	150-225
RedBarn Pet Products, Inc.	Manufacturing (Pet Treats)	150-225
Rosewood Services	Developmental Services	250+
Southard Corporation	Home Improvements	150-225
Sunflower Diversified Services	Developmental Services	100-150
Sunflower Electric Power Cooperative	Utility	300-500
Superior Essex	Wire Manufacturing	250+
The UKHS-Great Bend Campus	Medical Services	100-150
The UKHS-St. Rose Pavilion	Medical Services	50-100
Venture Corporation	Asphalt Road Construction	100-150
Wal-Mart Supercenter	Retail Discount	300-500
Western Ag Enterprise	Agriculture	50-100

SOURCE: Great Bend Chamber of Commerce

1.4 Population Demographics

A great deal of information can be derived from examining the population for Barton County as they relate to the generation of Solid Waste. Sources include: US Census Bureau; *Barton County Comprehensive Development Plan*, Barton County Planning Board; *Kansas Population Projections 1995-2030*, Kansas Division of the Budget; and *Annual Summary of Vital Statistics*, Kansas Department of Health and Environment. The sections to follow present a summary of the population demographics for Barton County, Kansas.

1.4.1 Residential Population

The historic populations of each city within the county are shown in Table 1-1.

Table 1-1
Barton County Historic Population

CITIES	1995	1997	2004	2010	2020
Albert	223	222	179	175	185
Claflin	674	675	682	645	406
Ellinwood	2,283	2,226	2,082	2,131	2,131
Galatia	49	45	60	39	29
Great Bend	15,259	15,144	14,927	15,995	15,358

Hoisington	3,212	3,246	2,953	2,706	2,840
Olmitz	135	141	135	114	71
Pawnee Rock	393	352	344	252	310
Susank	61	60	56	34	30
CITY TOTALS	**22,289**	**22,111**	**21,418**	**22,091**	**21360**
TOWNSHIPS	**1995**	**1997**	**2004**	**2010**	**2020**
Albion	61	50	56	63	32
Beaver	112	118	104	99	62
Buffalo	600	567	474	417	316
Cheyenne	265	264	229	207	292
Clarence	141	139	120	117	148
Cleveland	84	76	67	42	192
Commanche	502	494	445	462	314
Eureka	141	137	113	82	19
Fairview	75	74	65	89	91
Grant	73	75	76	55	111
Great Bend	2,005	1,923	1,797	1,752	1668
Independent	221	208	134	758	535
Lakin	323	331	288	262	252
Liberty	384	408	313	262	160
Logan	156	137	167	138	86
North Homestead	118	134	132	111	61
Pawnee Rock	156	155	180	373	410
South Bend	804	803	664	674	608
South Homestead	404	388	336	322	379
Union	78	74	68	101	63
Walnut	183	162	150	403	364
Wheatland	80	69	71	53	29
TOWNSHIP TOTALS	**6,966**	**6,786**	**6,049**	**6,842**	**6192**
GRAND TOTAL (CITY/TOWNSHIPS)	**29,255**	**28,897**	**27,467**	**27,674**	**27,552**

SOURCE: United States Census Bureau

This data is taken from the US Census Bureau. The portion of the county population not living in the incorporated communities are included in the "Township" line totals. For the purpose of this plan, township is synonymous with the term "Rural". To provide a somewhat more complete perspective of the service area of the Barton County Landfill, Table 1-2 contains population numbers of nearby counties that currently rely on or may rely on Barton County Landfill for disposal purposes.

Table 1-2
Historic Population
Of Adjoining Counties

COUNTY	2001	2002	2003	2010	2020
Barton	27,777	27,618	27,467	27,674	27,552
Pawnee	7,034	6,914	6,796	6,973	6,629
Ellsworth	6,450	6,393	6,347	6,497	6,231
Rice	10,628	10,519	10,412	10,083	9,658
Rush	3,516	3,464	3,418	3,307	3,022
Stafford	4,737	4,665	4,589	4,437	4,181
Russell	7,144	7,025	6,907	6,970	6,948
TOTALS	**68,434**	**67,286**	**66,598**	**65,936**	**64,221**

SOURCE: United States Census Bureau

A realistic investigation of rural Barton County trends and trends of other rural counties of the region, indicate the rural population will continue to decline in the future, but at a slower rate than in the past. However, when planning for long range needs that require large capital outlays, it is suggested that a more liberal projection be used. The basis for this is that projects must be designed so not to hinder the future growth and development of the community. A plan based on too conservative projection may inadvertently place restrictions on the community, hindering its ability to grow and prosper. The projections are taken from comparing population figures from the sources listed at the beginning of this section.

1.4.2 Commercial and Industrial Population

During the planning process, it is necessary to account for waste produced by commercial and industrial firms.

Although there is local growth in the manufacturing industry, it would not appear to be significant in comparison to the total employment category planning period. Therefore, it was determined that employment figures would be constant over the planning period. For the purpose of planning knowledge, Table 1-3 was generated to locate and classify the major employers in Barton County.

1.5 Physical Characteristics

1.5.1 Climate

The climate of Barton County is typical continental, sub humid, and is characterized by mild winters, hot summers, and moderate annual precipitation. Warm moisture-laden air from the Gulf of Mexico and cold arctic fronts traveling from higher latitudes often cause the weather in the area to change abruptly. During the absence of weather fronts, the principle of continentally affects the weather. This principle states that when an area occupies an inland location, as does Barton County, far from the moderating influences of the ocean, that area will tend to have high summer temperatures due to the tendency of land to quickly absorb heat during warm weather, and low winter temperatures due to the tendency of land to quickly lose heat in cold weather.

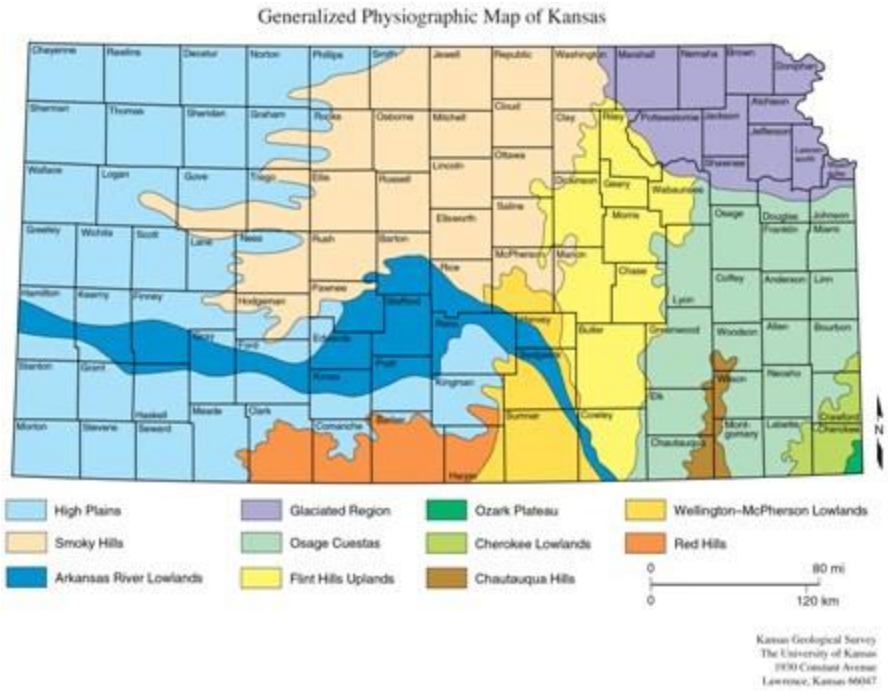
In the winter the average temperature is 33.5 degrees Fahrenheit, and the average daily low temperature is 22.0 degrees Fahrenheit. In the summer the average temperature is 78.7 degrees Fahrenheit, and the average daily high temperature is 91.4 degrees Fahrenheit. The total annual precipitation is 25.59 inches. Of this, 18.62 inches, or 73 percent usually falls in April through September. In 2 years out of 10, the rainfall in April through September is less than 13.57 inches. Average seasonal snowfall is 2.7 inches. On an average of 19 days each year, at least 1 inch of snow is on the ground. The sun shines 77 percent of the time in summer and 65 percent in winter. The prevailing wind is from the South. Average wind speed is highest, 13.1 miles per hour, in spring.

1.5.2 Physiography

Barton County is in the central part of Kansas. Most of Barton County is in the Rolling Plains and Breaks land resource area. Generally, the soils area deep, nearly level to moderately sloping, and have a clayey or silty subsoil. The most prominent naturally occurring feature is the relatively flat Cheyenne Bottoms basin.

The State of Kansas has nine physiographic areas. As indicated by the map below, Barton County is included within the boundaries of two of these areas.

Physiographic Areas of Kansas



1.5.3 Geology and Hydrogeology

Rocks of Cretaceous age crop out at the surface or underlie much of central and western Kansas. The Dakota formation, part of the Lower Cretaceous Series, is the uppermost bedrock unit in the vicinity of Barton County Landfill. Much of it is overlain by Pleistocene Sanborn loess.

The loess is composed chiefly of eolian material or loess-like silt, with some sand and gravel deposits near the bottom of the formation. The silt is tan, yellow tan, brown and gray in color and contains some fine sand, clay and caliche nodules. Fragments of "algal limestone", Cretaceous sandstone and "ironstone" are common at the base of the formation. The loess unconformably overlies the Dakota Formation which is 200-300 feet thick in the area.

The Dakota Formation is cretaceous in age and is composed of alternating beds of various colored clay, shale, siltstone, and sandstone. Clay is the dominant constituent in the Dakota Formation and is light to dark gray, white, tan, brown, yellow, or red in color. White, gray, yellow, tan and brown fine to coarse grained sandstone occurs as thin beds in the clay and as lenses ranging from a few feet to more than 30 feet in thickness. The sandstone lenses occur as discontinuous bodies that may be encountered in any part of the formation.

40 CFR 258.15 and KAR 29-29-102(f) require demonstration that landfills located in unstable areas be designed in a manner that will ensure integrity of containment structures (including liners, leachate collection systems and surface water control systems). Unstable areas can include poor foundation conditions, areas susceptible to mass movements and Karst terrains. None of these conditions exist based on review of the literature and the subsurface investigations previously completed on the site.

1.5.4 Seismic Impact Zones

In August 1996, Terracon Environmental, Inc. performed seismic evaluation for Barton County. 40 CFR 258.14 and KAR 28-29-102(e) restrict waste management units in seismic impact zones. These zones are defined as areas with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material will not exceed 10 percent of the acceleration due to gravity in 250 years. The probable maximum horizontal acceleration expressed as a percent of the acceleration due to gravity for the landfill ranges between 7 to 9 percent.[1]

1.5.5 Fault Areas

In August 1996, a fault investigation was conducted by Terracon Environmental, Inc. 40 CFR 258.14 and KAR 28-29-102(e) restrict waste management units so that they are at least 200 feet from a fault that has had displacement within the Holocene Epoch. Review of the literature and a walk-through of the site did not indicate the presence of such a fault within 200 feet of the landfill property. Additionally, in a conversation with Mr. Jim McCauley of the Kansas Geological Survey (KGS), he indicated that he was not aware of any fault in Barton County that had experienced displacement within the Holocene Epoch.

1.5.6 Airport Safety

40 CFR 258.10(a) and KAR 28-29-102(a) prohibit the location of landfills within specified distances of runways used by piston or turbo-jet type aircraft at public airports unless a demonstration can be made that the

[1] Algermissen, S.T. et al. 1982. Probabilistic Estimates of Maximum Acceleration and Velocity in Rock in the Contiguous United States. U.S. Department of the Interior Geological Survey. Open-File Report 82-1033, Plate 3.

landfill is designed and operated so as not to pose a bird hazard to aircraft. The distances are 5,000 feet for piston and 10,000 feet for turbo-jet type aircraft. Additionally, new units or lateral expansions within a five-mile radius of any airport runway end must notify the affected airport and the Federal Aviation Administration (FAA). In August 1996, a review of the Wichita, Sectional Aeronautical Chart[2], by Terracon Environmental, Inc. did not identify any airports located within 10,000 feet of the landfill. The Great Bend Municipal Airport is located approximately eight nautical miles from the landfill.

1.5.7 Wetlands

40 CFR 258.12 and KAR 28-29-102(c) restricts waste management units in wetlands as defined in 40 CFR 232.2 (r). In August 1996, Terracon Environmental, Inc. preliminary investigation discovered an area of approximately 12 acres located on the eastern edge of the current landfill property, which appears to meet the three criteria for a wetland established by the Army Corp of Engineers (COE). Additionally, on March 16, 1994, Mr. Charles Waknitz, District Conservationist for the Soil Conservation Service, (SCS), stated that the SCS defined the area as a wetland. However, the landfill is approximately 200 feet west of the wetland area and no impact upon the wetland will occur due to landfill operations.

1.5.8 Floodplains

40 CFR 258.11 and KAR 28-29-102(b) requires demonstration that waste management units will not restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. Flood Insurance Rate Map (FIRM) Panel 20009 C0390 E, revised February 15, 2019, indicates that the landfill is located outside the 100-year floodplain. Therefore, restrictions of flood flow, reduction of temporary storage capacity of the floodplain, and risk of solid waste washout from a 100-year flood event should not occur.

2. Local Transportation Network

2.1 Federal and State Highways

[2] Wichita, Sectional Aeronautical Chart, October 14, 1993; National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 51st Edition.

The locations and designations of Federal and State highways, and secondary road thoroughfares in Barton County are shown in Figure 2 – 1, General Highway Map. The County is served by US Highways 56 and 281. Barton County is crossed centrally from North to South by US Highway 281. US Highway 56 travels East/West through the South portion of the County. Both are major highway arterials that intersect in the City of Great Bend. As a result of these two modern highways, the City of Great Bend, as the County's economic and government center, is well connected to other parts of the State and region.

Other State routes within Barton County include Highways 4, 96 and 156. Highways 4 and 96 run East to West. Highway 4 crosses the northern part of the County and 96 crosses the southern part. Highway 156 extends diagonally, entering at the Southwest corner of Barton County, connecting to I-70 in Ellsworth County.

2.2 Federal Aid Secondary Roads (FAS)

The Federal Aid Secondary Road system in Barton County serves as the chief access links from the Federal and State highways to areas in the County. They also serve as connecting routes for rural areas and between cities which are not linked by major highways. The FAS system provided service throughout the rural areas, access to each incorporated city, and access to unincorporated communities. The FAS program is administered by the County with matching federal funds.

The following County FAS roads serve Barton County in the East/West direction and generally serve in the capacity indicated:

1. FAS 41 – Connecting link from K-96 to FAS 462.
2. FAS 462 – Access to Great Bend from West.
3. FAS 981 – Main East/West FAS Route in southern Barton County.
4. FAS 44 – Access to Galatia and Susank.
5. FAS 1936 – East/West access North of Great Bend and East of US 281.

The main Federal Aid Secondary roads which serve in the North/South direction are as follows:

1. FAS 1843 – Access to Albert.
2. FAS 37 – Access to Pawnee Rock.
3. FAS 38 – Provides Arkansas River crossing West of Great Bend.

4. FAS 39 – Access to Claflin and Ellinwood.
5. FAS 47 – Access to Hoisington and Susank.
6. FAS 48 – Access to Galatia.
7. FAS 43 – Access to Olmitz.

Barton County maintains 375 miles of paved roads. Figure 2-2 shows all paved roads in Barton County. This includes FAS routes and minor collectors. There are approximately 1286 miles of gravel roads which are maintained by the townships. The County is responsible for maintenance of all 400 bridges on county and township roads. Barton County has maintained an aggressive bridge replacement program, there are only fifteen bridges with weight restrictions on county and/or township roads.

2.3 Adjoining County Access

Barton County currently accepts waste from adjoining counties for disposal of their solid waste. Federal or State highways provide access within 2.5 miles of the Barton County Landfill. Pawnee County is provided with access on US Highway 56 and 281. Ellsworth County is served by State Highway 156. Rush County has access by two different routes: State Highway 4 connecting in Hoisington to US Highway 281 or State Highway 96 direct to Great Bend. The remaining adjoining counties, not currently contracting with Barton County are Russell, Stafford, and Rice. Russell and Stafford counties are provided direct access by US Highway 281 and Rice County by State Highway 56.

3. Waste Characterization & Quantities

3.1 Waste Characterization

Inspection of solid waste disposed of at Barton County Landfill, review of Barton County Landfill records, literature reviews and analysis of publicly available documents were undertaken to estimate waste quantities and characteristics. However, typical characterizations data was not available. Table 3 - 1 shows the characteristics of Barton County Landfill's waste and quantities.

3.1.1. Residential/Commercial

Based on current data, residential and commercial sectors are combined since both sectors are assumed to be homogenous. An estimated 28,713 tons of residential/commercial waste was received at the County Landfill during 2024. Using the total population of the counties

disposing of waste at the Barton County Landfill (i.e., Barton County + Ellsworth County + Pawnee County) of 40,412 persons (using the 2020 U.S. Census population figures), the 2024 per capita annual waste disposal rate would be 3.89 pounds per day, per capita. The 2020 figure was 3.85 pounds per day, per capita. This shows an increase of 0.04 pounds per day, per capita.

Construction & Demolition wastes for 2024 were estimated at 10,811 tons. Using the population data above, the per capita annual waste disposal rate for construction & demolition waste is estimated at 1.47 pounds per day, per capita.

The quantity projections included in this plan assume a residential/ commercial rate of 3.89 pounds per day per capita and a C&D waste generation of 1.47 pounds per day per capita.

3.1.2. Industrial

Based on the review of Barton County Landfill's Industrial Solid Waste Disposal Authorizations (I.S.W.D.A.) issued by KDHE, and landfill records of charge account permit holders considered to be industrial entities (Fuller Brush, Essex, Hazmat Response, etc.), the amount of industrial waste has been estimated to be 13,011 tons for 2024. This includes the categories of contaminated soil and liquid waste since these materials were included in the I.S.W.D.A. data.

3.1.3. Institutional

Generally, institutional waste includes solid waste generated by schools, colleges, prisons, hospitals, and other similar establishments which is extremely difficult to quantify without extensive studies. In fact, unless high concentrations of institutions exist within the planning area, institutional waste normally is included in the residential/commercial waste category. For Barton County, it is assumed that all institutional waste quantities are included in the residential/ commercial sector.

3.1.4. Construction and Demolition

C & D wastes can have a serious impact on the quantities that the solid waste management system must be able to handle. Construction and demolition materials from Barton County and the surrounding counties have primarily been from the development and/or demolition of residential, commercial, and industrial facilities. The amount of C&D wastes disposed at the County Landfill during 2024 was 10,811 tons.

Table 3-1

Characteristics of Barton County's Waste and Quantities
2024

CATEGORY	TONS	PERCENT BY WEIGHT
Residential/Commercial Waste		
General (Residential) Commercial		
Commercial		
Subtotal	***28,713***	***54***
Construction/Demolition Waste	**10,884**	**21**
Special Waste		
Asbestos	37	
Brine Soil	1,045	
Gun Barrel	54	
Medical Waste	16	
Tires	99	
Other Contaminated Soils	4,436	
Petroleum Soil	5,039	
Other Special Wastes	2,412	
Subtotal	***13,138***	**25**
TOTAL	**52,735**	**100%**

3.1.5. Special Waste

KDHE considers special wastes to include the following items:

- Abandoned vehicles
- Agricultural wastes
- Construction and demolition waste
- Dead animals
- Forestry wastes
- Household hazardous waste (HHW)
- Pesticides and pesticide containers
- Septage wastes
- Sludges
- Tires
- Used motor oil
- White goods
- Yard wastes

For the purposes of this plan, agricultural wastes, C&D waste, septage wastes, and sludges will be discussed independently. HHW, exempt hazardous waste from small quantity generators, and yard wastes were included as categories in the individual waste generating sectors. All other wastes will be assumed to be included already in the residential/commercial and industrial categories. Although the quantities of these materials are not estimated, these wastes will still require management systems.

3.1.6. Sludge and Septage Wastes

Barton County has three major municipal wastewater treatment facilities which are located in the cities of Great Bend, Ellinwood, and Hoisington. Great Bend and Ellinwood will continue to dry the treated waste with application to agricultural lands, in accordance with KDHE regulations. Hoisington uses a lagoon system, and the treated waste is removed, and land applied if conditions allow. Additionally, there are several private sewer systems within Barton County that produce waste solids. However, the management of these is unknown at this time. Kansas Administrative Regulations prohibit liquid waste at MSWLF so most individual septic systems are either land applied or taken to wastewater treatment facilities. At this time, it is unknown how much septic tank waste is handled throughout the county as solid waste.

3.1.7. Agricultural Wastes

The current Barton County solid waste management system does not handle any significant quantities of agricultural wastes resulting from farming, ranching, and other similar activities. Modern agricultural practices generally require the on-site managing of wastes, both liquid and solid, because of the significant quantities of materials generated. Therefore, for the purposes of this plan, any agricultural wastes not accounted for in the industrial waste stream will be considered out-of-system waste and not require either accounting or management.

3.2. Waste Distribution Throughout Planning Area

Based upon the population predictions and industrial facilities inventory presented in Chapter 1 and the unit generation rates presented previously in this chapter, estimates of the quantities of residential/commercial, C&D, and industrial solid wastes have been prepared.

3.3 Handling and Disposal of Special Wastes

As previously defined, special wastes are either not commonly received at existing disposal areas or require special handling or treatment for disposal. In general, there are no significant, unusual problems with special waste handling and/or disposal in Barton County different from those experienced in other areas of the state of Kansas.

3.3.1. Abandoned Vehicles

Barton County does not appear to generate an unusually large or significant quantity of abandoned vehicles. It appears that the existing salvage yards provide adequate capacity to manage these wastes.

3.3.2. Agricultural Wastes

Significant quantities of waste are produced by every sector of agriculture in Barton County. Ranging from the manure produced by feed lot operations to the crop residue and spoilage. An evaluation of the current agricultural waste management system indicates that this waste is being managed at the point of generation and very small percentage of agricultural waste (spoiled grain, hay, manure, etc.) is currently being disposed of at the County landfill. Since best management practices (BMPS) for the agricultural sector now call for the use of wastes as soil

supplements, the management of these wastes do not present any special handling and/or disposal concerns. Certainly, within the scope of maintaining and preserving the environment, especially with respect to the surface water and groundwater, particular attention will be required. The County Agricultural Extension is the primary agent for communicating the BMPS and helping to protect the rural environment.

3.3.3. Construction and Demolition Wastes

Barton County generates a moderate volume of C&D wastes. The handling of the materials can pose a problem at the Landfill if proper equipment is not available. On April 24, 2001, Barton County received a conditional approval from KDHE for the disposal of solid waste in an unpermitted area within the property boundaries of the Barton County Municipal Solid Waste Landfill. The waste resulted from tornado damage in the City of Hoisington on April 21, 2001. On May 1, 2001, Barton County received authorization from KDHE to place construction and demolition waste from other sources other than the Hoisington tornado clean-up areas in the so-called C/D pit at the Barton County Landfill. A new permitted Construction & Demolition Landfill was constructed in 2003. This new disposal area is located over the previously closed, Pre-Subtitle D landfill and covers approximately 13.4 acres. Only those materials allowed by KDHE regulations are allowed in the current site. Burning of clean lumber is no longer practiced.

3.3.4. Dead Animals

Barton County does not appear to generate an unusually large or significant quantity of dead animals. It appears that any dead farm animals are handled on-site by means of disposal to a rendering facility. The county landfill is an adequate means of disposal for the comparatively small numbers of household animals which die or are euthanized by the Humane Society.

3.3.5. Forestry Waste/Yard wastes

Barton County does not generate a significant quantity of forestry wastes from land clearing, routine forestry, storm damage clean-up, or disease management programs. Barton County landfill by county resolution 2000-13 does not accept forestry wastes. Customers are referred to permitted burn sites in the cities of Great Bend, Ellinwood, and Hoisington free of charge to the citizens of Barton County.

3.3.6. Household Hazardous Waste (HHW) and Exempt Hazardous

Waste

The proper management of these hazardous wastes is increasingly becoming a major concern for communities. The need to remove HHW and exempt hazardous waste produced by small quantity generators from the waste stream is a considerable challenge, especially from an economic standpoint. Commonly found HHW in Barton County includes used motor oil, batteries, paints, yard chemicals, pesticides, household cleaners, solvents, and pool chemicals. Barton County currently has a permanent HHW facility located at the landfill, where regularly scheduled collections are held. Periodically, the HHW is removed by Clean Harbors and taken to a disposal and/or recycling facility.

3.3.7. Pesticides and Pesticide Containers

Because of the large agricultural community, it would be expected that sizable quantities of pesticide waste would be produced; however, because of the expense of chemicals and BMPS, it is not expected that large quantities truly exist except for banned pesticides. Because of their toxicity and potential for environmental degradation, these materials must be handled carefully. If empty containers are triple rinsed according to 40 CFR 262.70, then they can be handled with the regular waste stream and can be accepted at the landfill. The pesticides should be used or properly disposed of. Proper disposal is similar to what is required for HHW and other exempt hazardous wastes.

3.3.8. Septage Waste

Barton County does not appear to generate unusually large or significant quantities of septage waste. The existing publicly owned treatment works (POTW) and land application programs provide sufficient management of these wastes.

3.3.9. Tires

Currently, waste tires are collected at the County landfill and Champlin Tire Recycling, Concordia, Kansas, is contracted to pick up the tires from the landfill location. The current tire disposal rate for 2025 is $214.60 per ton. The major difficulty with handling waste tires is their bulky nature; however, the existing system has sufficient capacity to adequately handle the waste volume.

3.3.10. Used Motor Oil

Barton County does not appear to generate an unusually large or significant quantity of used motor oil. Currently, used motor oil is stored in a 550-gallon capacity aboveground polypropylene tank with secondary containment berm. Periodically, a private recycler, GFL Environmental comes to collect the used motor oil. The current used oil disposal rate for 2025 is $.55 per gallon.

3.3.11. White Goods

White goods consisting of used household appliances are currently being dropped off in a designated area of the landfill for recycling by Allmetal Recycling, Great Bend, Kansas. Chlorofluorocarbons are removed by a Barton County employee. Other than the bulky and massive nature of these wastes, Barton County does not have any special handling and/or disposal concerns. Barton County does not generate an unusually large quantity of white goods.

3.3.12. Yard Wastes

Barton County generates a sizable quantity of yard waste. On September 7, 2000, the Barton County Board of County Commissioners passed resolution 2000-23 banning yard waste at the Barton County Municipal Solid Waste Landfill. Yard wastes are accepted at permitted composting sites in the cities of Great Bend, Ellinwood, and Hoisington free of charge to the citizens of Barton County.

Resolution 2000-23 is attached.

3.3.13. Medical Waste

Medical waste is generated within the county at various clinics, nursing homes, and three local hospitals. Currently, Barton County has chosen to accept medical wastes at the County landfill, provided they are properly packaged, labelled, and have a Special Waste Authorization from the KDHE. Medical waste contractors currently regularly disposing of medical waste at Barton County Landfill include:

1. Barton County Health Department
   1300 Kansas Ave. Suite B
   Great Bend, KS 67530
2. MMWD (Cody Vinsonhaler)
   24 NE 20 Road
   Great Bend KS 67530
3. Tamarac Medical Waste
   3959 E. Arapahoe Rd. Ste 100

Centennial, CO 80122

4. Unruh Brothers Waste
   P.O. Box 234
   Great Bend, KS 67530

3.3.14. Asbestos

The disposal of asbestos containing materials (ACM) is regulated by both Federal and State government agencies. ACM is any material which contains more than one percent asbestos as determined by Polarized Light Microscopy. The KDHE administers asbestos removal and disposal criteria contained in the National Emissions Standards for Hazardous Air Pollutants (NESHAP). The Barton County Landfill now accepts Category 1 non-friable ACM, Category 2 non-friable ACM, and friable ACM. The Barton County Landfill is a permitted disposal site for these materials. The landfill operators are required to be trained to recognize Category 1 and Category 2 non-friable ACM and the potential health hazards presented by these materials. If friable asbestos is disturbed at the landfill and asbestos fibers are released, properly trained personnel will be required to control the situation.

4.3.15 Natural Disaster Wastes

A new permitted Construction & Demolition Landfill was constructed in 2003. This new disposal area is located over the previously closed, Pre-Subtitle D landfill and covers approximately 13.4 acres. The C &D landfill has sufficient airspace to handle natural disaster wastes. Additionally, an emergency disaster location could be opened in the permitted area, if necessary, as done for the Hoisington tornado. The solid waste director is part of the Local Emergency Management Planning Committee.

Lead Acid Batteries

Lead acid batteries that are received through Barton County HHW program are recycled through Allmetal Metal Recyclers in Great Bend, KS.

4. Existing Waste Management Practices

4.1. Inventory of Public and Private Systems

The existing solid waste management disposal system was developed from recommendations in the Solid Waste Management Plan submitted in March of 1972. The plan recommended the following:

- Barton County should be served by a single agency with the responsibility of implementing and operating a solid waste management system.
- The Barton County Government should be the operating agency.
- A department should be created within the county government to administer the program.
- The sanitary landfill method of disposal should be employed, and one site should be selected to serve the entire county.
- The transportation and collection system should be designed to serve the rural areas as well as the towns and cities.
- Operating cost should be met by the collection of user fees.

Soon after receiving this report the Barton County Commission approved a resolution authorizing funds for the construction and operation of a solid waste and refuse facility. The location selected is the current operating site located in the Southeast quarter of Section 12, Township 19 South, Range 13 West, approximately one mile east of the Barton County Community College. The Barton County Landfill was officially opened January 1, 1973. Prior to the opening of the county landfill, each city operated its own refuse disposal site. These soon closed and the county landfill became the repository for all municipal trash in Barton County.

4.1.1. Storage

KDHE Administrative Regulation 28-29-21 requires the owner or occupant of any premise, business establishment, or industrial plant to provide for the sanitary storage of all solid waste. Garbage and putrescible waste shall be stored in:

- Rigid containers that are durable, rust resistant, nonabsorbent, watertight, and rodent proof. The container shall be easily cleaned, fixed with close-fitting lids, fly-tight covers, and provided with suitable handles or bails to facilitate handling.
- Rigid containers equipped with disposable liners made of reinforced kraft paper or polyethylene or similar material designed for storage of garbage.
- Nonrigid disposable bags designed for storage of garbage. The bag shall be provided with a wall hung or free-standing holder which supports and seals the bag; prevents insects, rodents, and animals from access to the contents; and prevents rain and snow from falling into the

bag; or

- Other types of containers meeting the requirements of 16 Code of Federal Regulations Chapter II Subchapter B, part 1301 in effect June 13, 1977, and paragraph (a) of this regulation and that are acceptable to the collection agency.

No putrescible bulky waste may be stored temporarily in any manner that creates a health hazard. The cities of Great Bend, Ellinwood, and Hoisington have approved ordinances that provide for proper storage meeting the above regulations. Independent haulers who serve most of the smaller cities and rural areas often provide rigid containers as part of their collection service. As a minimum, most individuals use nonrigid disposal bags, usually in conjunction with some form of rigid container. Commercial and Industrial businesses normally use receptacles that range from 3 cubic yard dumpsters to 40 cubic yard boxes.

4.1.2. Collection and Transport

The collection and transportation of waste is performed through a variety of systems depending on location in Barton County. The Cities of Ellinwood and Hoisington have contracted with Stutzman's Refuse Disposal for their waste collection services. The City of Great Bend does not regulate the overall collection of waste but does require a permit for any hauler to do business in the city. Individual residences and businesses are free to contract with any hauler. The Cities of Albert, Galatia, Pawnee Rock, Olmitz, Claflin, and Susank either have formal agreements for collection and disposal; or businesses and individuals contract for services with haulers. Unincorporated cities, rural subdivisions and rural residences are responsible for their own collection and disposal. Waste is also transported to the landfill by individual citizens and construction haulers in general purpose trucks and pickups. A list of independent haulers is shown in Table 4 - 1.

Table 4 - 1

Independent Haulers

Stutzman's Refuse Disposal	S.Hutchinson, KS 67505
Cliff's Trash	Great Bend, KS 67530
Chism Trash Service	Seward, KS 67576
Stone Waste Mgt	Great Bend, KS 67530
Anspaugh Waste	Great Bend, KS 67530
Unruh Bros Trash Service	Great Bend, KS 67530
Al's Trash Service, LLC	Great Bend, KS 67530

4.1.3. Disposal

Development of the Barton County Landfill proceeded after completion of the 1972 Solid Waste Management Report. The landfill is located approximately 3 miles North and 3.5 miles East of Great Bend. The landfill opened in January of 1973 and was originally operated by a private contractor. The county later assumed operation and was issued permit number 103 by the Kansas Department of Health & Environment in September of 1976. The County originally leased the landfill site and later purchased the property in 1979. The active site was approximately 30 acres in the Southeast quarter of Section 12, but the County purchased the entire East half of Section 12, Township 19 South, Range 13 West. The County has since operated the landfill in accordance with the permit conditions.

With the passage of the landfill regulations in 1991 new decisions needed to be made regarding the disposal of solid waste. A study was prepared by a consulting engineering firm to determine the feasibility of the current site in meeting the new regulations and standards. Based on this study, the Solid Waste Committee made recommendations to the County Commission to proceed with development of a Subtitle D Landfill. In order to progressively move from operating the existing landfill site and its closure to operating a Subtitle D landfill the County elected to pursue a Subtitle D vertical expansion permit. Barton County was issued this permit October 9, 1996. On September 30, 2001, KDHE amended the permit to allow an extension of the vertical expansion and amend the permit to a lateral expansion. On January 11, 2002, KDHE issued Barton County a permit to operate the Subtitle D lateral expansion area. Closure of the vertical expansion landfill took place late summer of 2003. In the fall of 2001, Barton County constructed Phase 1 of the Sub-title D Landfill. Phase 1 was the first of six planned phases of an approximately 42-acre eastward lateral expansion to the original disposal site. Phase 2 of the Sub-title D Landfill was constructed in 2004.

On April 21, 2001, a tornado struck the city of Hoisington, located in Barton County. To facilitate cleanup of debris from this disaster, KDHE issued Barton County a temporary permit for a construction and demolition (C&D) waste disposal area at the Barton County Landfill on April 24, 2001. On May 2, 2001, Barton County received authorization from KDHE for general C&D waste to be disposed in the area. Barton County has completed closure of the existing C&D and a new permitted C&D disposal area opened in late summer 2003. During late summer of 2003, Barton County closed the temporary C&D disposal area and constructed

a new, permitted 13-acre Construction & Demolition Landfill. Also, during this period, construction of the final cap of the Pre-Sub-title D, Vertical Expansion Landfill was completed. An alternative closure design incorporating evapo-transporation technology was placed instead of a typical geomembrane cap system.

Annual tonnages are shown in Table 4 - 2, waste characteristics are shown in Table 4 - 3.

Table 4 – 2

Annual Tonnages Received at Barton County Landfill

YEAR	TONS	COMMENTS
2000	54,717.08	
2001	49,583.07	
2002	28,724.16	
2003	24,794.81	
2004	28,768.34	
2005	30,185.88	
2006	25,089.89	
2007	26,766.58	
2008	23,365.29	
2009	36,316.37	
2010	28,964.55	
2011	38,071.85	
2012	27,340.18	
2013	34,427.07	
2014	33,203.96	
2015	28,299.42	
2016	36,447.35	
2017	42,334.91	
2018	37,157.92	
2019	43,332.73	
2020	39,809.03	
2021	38,544.87	
2022	44,067.22	
2023	50,990.05	
2024	52,512.74	
TOTAL	903,815.32	

Table 4 - 3

Characteristics of Barton County's Waste and Quantities
2024

CATEGORY	TONS	PERCENT BY WEIGHT
Residential/Commercial Waste		
General Commercial (Residential)	26,129	**45**
Commercial	2,584	**9**
Subtotal	***28,713***	***54***
Construction/Demolition Waste	**10,884**	**21**
Special Waste		
Asbestos	37	
Brine Soil	1,045	
Gun Barrel	54	
Medical Waste	16	
Tires	99	
Other Contaminated Soils	4,436	
Petroleum Soil	5,039	
Other Special Wastes	2,412	
Subtotal	***13,138***	***25***

TOTAL	***52,735***	**100%**

A list of landfill equipment and their use is as follows:

Equipment Name	**Equipment Use**
2015 Dodge Pickup	General Transportation
2015 Chevy Pickup	General Transportation
2022 Dodge Pickup	General Transportation
2002 John Deere Grader	Road Maintenance
1988 615C Caterpillar Scraper	Cover, Hauling and Construct
2015 826K Compactor	Spreading and Compacting
1998 826G Caterpillar Compactor	Spreading and Compacting
2001 615C Caterpillar Scraper	Cover, Hauling and Construct
2003 Kenworth Roll-Off Truck	Material/Recycling Hauling
2021 T770 Bobcat Loader	Material Handling
1978 John Deere Backhoe	Clearing Material
2017 John Deere Loader	Material Handling
1996 Ford F-350 Fire Truck	Fire Control
2002 International Truck	Daily Refuse Cover

The full-time landfill operation staff and hours worked include:

- 2 – Scale Clerks (4 days/wk, 10 hrs/day)
- 5 – Heavy Equipment Operators (40-50 hrs/wk)
- 1 – Solid Waste Director (40 hrs/wk)

Other permitted disposal operations in Barton County are:

#0103	Barton County Sanitary Landfill Subtitle D Sec. 12-T19S-R13W	(620)793-1898
#0606	Barton County HHW Program Sec. 12-T19S-R13W	(620)793-1898
#0808-S	City of Great Bend Compost Site NE1/4 Sec. 5-T20S-R13W	(620)793-4111
#0767-S	City of Hoisington Compost Site	(620)653-4125

	SW1/4 Sec. 3-T18S-R13W	
#0821-S	City of Ellinwood Compost Site SE1/4 Sec. 25-T19S-R13W	(620)564-3161
#1084	City of Albert Tree and Brush Burn Site Sec. 33-T18S-R15W	(620)923-4665
#1159	City of Claflin Tree and Brush Burn Site Sec. 4-T18S-R11W	(620)587-3707

4.1.4. Rates

Table 4-2 summarizes the present disposal fees charged by Barton County Landfill for residential/commercial waste.

Table 4 - 2
Barton County Landfill Rate Schedule

ITEM	RATE
Annual Permit	$25.00/year
Tipping Fee	$42.00/ton
Tipping Fee Minimum Charge	$10.00/ton
Construction/Demolition Tipping Fee	$36.00/ton
Industrial Solid Waste Disposal Auth.	$25.00
Passenger Tires & Light Truck (Up to 4)	$3.50 each
Large Tires & Quantities 5 and Over	$.12/pound
Mower & Motorcycle Tires	$2.00 each
Tires With Rims (plus tire fee)	$7.50 each
Household Hazardous Waste	No Charge
Used Oil	No Charge
CFC Unit, Uncertified	$25.00 each
Unsecured Load	Up to 50% of weight chg.
Asbestos (Friable)	$90.00/ton
Asbestos (Non-Friable)	$60.00/ton
Contaminated Soil	$30.00/ton
Clean Concrete	$15.00/ton

4.2. Recycling Activities

Recycling activities in Barton County are voluntary and are largely handled by 4 main recyclers in the incorporated areas (Sunflower Diversified Recycling Center, Rosewood Ecycle, ACME Pipe and Steel, and Allmetal Recycling) along with Stuzman's Refuse & Recycling offering drop off sites in Hoisington and curbside recycling in Ellinwood. Ellinwood began offering curbside recycling on January 1, 2025. Since then, there are now over 450 recycling customers, which is over 50% of its households, and the numbers keep growing. Recycling efforts have greatly influenced the volume of waste reaching the landfill for disposal. Currently there is no recycling program written for Barton County. Succeeding paragraphs reflect examples of recycling activities within the county and are not intended to be an exhaustive inventory.

4.2.1. Waste to Energy

There are no operating, permitted incinerators in the County for combustion of solid waste and recovery of energy.

4.2.2. Composting

Several of the existing city ordinances pertaining to solid waste have clauses that forbid burying of any solid waste on private premises but permit the composting of leaves and grass trimmings. The Barton County Landfill does not accept grass and tree trimmings. The cities of Great Bend, Ellinwood, Hoisington and Claflin operate municipal composting facilities. Several of the incorporated areas operate tree limb burn sites.

4.2.3. Material Recovery

Barton County Landfill currently recycles metals including white goods, tires, used oil, and mattresses. The following businesses accepting items for recycling include:

- Acme Pipe and Steel - assorted metals.
- Allmetal Recycling - assorted metals.
- Wal-Mart - plastic bags.
- Dillons - plastic bags.
- Sunflower Recycling – plastic containers, aluminum and steel cans, glass, cardboard, paper products.
- Rosewood – electronic waste.

The following is a list of sellers of recyclable materials:

- Goodwill - clothing and household items.
- Salvation Army Thrift Store - clothing and household items.
- Sunflower Recycling

Sunflower Diversified Services: Concerned for the preservation of the local government, Sunflower Diversified Services works closely with the cities of Ellinwood, Hoisington, Claflin, Larned, and the Barton County Landfill to encourage the diversion of waste from the landfill. The facility is located in Great Bend, providing the public with a drop-off service and commercial/industrial businesses are provided with on-site collection services for fiber materials. Materials accepted by Sunflower Diversified Services include: plastic bottles/jugs, aluminum and steel cans, glass, cardboard, computer and office pack paper, newspaper and magazines. ***Below are services provided and locations.***

PUBLIC DROP OFF	**PRODUCTION BUILDING**
5605 10TH Street, Great Bend Convenient location for drop off of home or small business recyclables, and document shredding Customer assistance available Hours: Monday – Friday 9:00 am – 6:00 pm Saturdays 9:00 am – 1:00 pm Phone number: (620) 793-5800	8823 4th Street, Great Bend Business and Industrial pickup services Document Shredding Material processed from outlying community Hours: Monday – Friday 9:00 am – 4:00 pm Phone number: (620) 792-1321

Confidential Shredding services are offered with pricing per pound of material.

Sunflower Diversified Services 2024 Recycling Numbers

Fiber – consist of Cardboard, Office Paper, Newspaper, & Magazines
Plastic – consist of #1 Clear Plastic, Milk Containers #2, & Colored Plastic #2
Glass – No Window Glass
Aluminum Cans – Pop, Beer, Etc.
Scrap Metal – Tin Cans (vegetables, soups, etc.)

Fiber	Plastic	Glass	Aluminum	Scrap Metal
86,100	28,240	58,000	5,380	10,840
137,260	25,445		4,820	7,860
73,600			4,820	7,860
130,200				8,680
43,280				
92,200				
130,800				
80,900				
86,940				
42,640				
137,940				
71,060				
1,112,920	**53,685**	**58,000**	**15,020**	**35,240**

Numbers are recorded in pounds.

ACME Pipe and Steel, recycled 23 million pounds of metal material in 2024 from the Barton County area.

Superior Essex, Hoisington Kansas, implemented a Zero Waste to Landfill (ZWTL) initiative in 2014, maintaining this status by diverting 100% of its waste from landfills through recycling, composting, and energy recovery processes. Superior Essex has achieved certification of remaining zero waste for 10 years. Essex is one of only a handful of companies across the United States with a verified Zero Waste to Landfill certification.

4.2.4. Other Recycling

Barton County Landfill currently contracts with Champlin Tire Recycling, Concordia, Kansas, to pick up used tires collected on site. The Landfill separates metal and white goods for recycling and transports those items to Allmetal Recycling, located in Great Bend, Kansas. Barton County also recycles mattresses through Hutchinson Correctional Facility. From 2008 to present day, Barton County Landfill has diverted 1,373.54 tons of tires,

588.13 tons of metal, and 491.39 tons of mattresses from the waste stream from the waste stream.

4.2.5. Electronics Recycling

The Barton County Landfill is a collection point for recycling of electronics waste through the Rosewood Services E-waste Program. Materials accepted for recycling include: computers, DVD players, VCR's, cell phones, microwaves, monitors, etc. The program is offered free of charge to households, schools, businesses, and government offices in Barton County. Rosewood ECycle handles approximately 3,000 pounds of goods each month, which equates to roughly 18 tons annually. From 2008 to present day, Barton County Landfill has diverted 249.73 tons of electronics from the waste stream.

4.2.6. Recycling Drop-Off Locations

Barton County Landfill 350 NE 30 Road Great Bend, KS 67530 (620) 793-1898	**Sunflower Diversified Recycling Center** 5605 10th Street Great Bend, KS 67530 (620) 792-1321
ACME Pipe and Steel 700 Frey Street Great Bend, KS 67530 (620) 793-6532	**Barton Community College** 245 NE 30 Road, on Campus Great Bend, Kansas 67530 (800) 748-7594
Allmetal Recycling 70 SE 16 Road Great Bend, KS 67530 (620) 388-5636	**Rosewood Ecycle** 2200 Main Street (Maintenance Building) or 1215 Main Street) Rosewood Bargain Barn) Great Bend, KS 67530 (620) 793-58898
Hoisington, Kansas Recycling Center, Corner of 2nd & Main (Across the Alley, Behind Wilson State Bank)	**City of Claflin** 710 West Front Street (City Shop) Claflin, Kansas 67525 (620) 587-3707
Town & Country Market 818 Elm Street Hoisington, Kansas 67544 (620) 653-2330	**Stafford County Landfill & Recycling Center** 236 NE 10th Avenue St. John, KS 67576 (620) 549-6181
Larned Recycling Center 826 E. 14th Street Larned, KS 67550 (620) 285-8500	

Kans for Kids (Aluminum Cans) Drop-Off Sites

Hoisington, Kansas Recycling Center, Corner of 2nd & Main (Across the Alley, Behind Wilson State Bank)	**Great Bend, Kansas** East of Best Western, 10th Street ACME Pipe and Steel, 700 Frey Street Sarge's Saloon, 2801 Main Street
Larned, Kansas Comfort Pro, 301 14th Street	**Albert, Kansas** Fire Station
Olmitz, Kansas Recycling Center	**Ellinwood, Kansas** Knop Auto Parts
Claflin, Kansas Behind the Library, 108 Main Street	**Odin, Kansas** Knights of Columbus
Russell, Kansas Comfort Pro	**Gorham, Kansas** Quick Connection
Lyons, Kansas Across from Pizza Hut	**St. John, Kansas** 339 N. US Hwy 281, Next to G&S Motor Co.

4.3. Existing Organizations, Staffing and Facilities

Barton County is responsible for solid waste processing and disposal within the County. County solid waste operations are the responsibility of the Solid Waste Department, under the general direction of the policymaking, five-member Board of County Commissioners.

5. Planning Challenges

5.1. Legislative / Regulatory Review

National policy on environmental concerns has been established by Congress in a series of laws to safeguard the American public health and environment by controlling specific forms of pollution. These laws, as developed by the US Environmental Protection Agency (USEPA) and other federal departments and agencies, formulate the guidelines by which government, business and the public must conduct themselves to safeguard our natural resource today, and for the future.

State governments, required to act in the national and local interest, either adopt the Federal Regulations or develop similar legislation designed to address the specific needs and circumstances of the State and its constituency. This results in situations where states enact rules, regulations, guidelines, and criteria, generally drafted by state regulatory

and enforcement agencies, designed to carry out legislation custom tailored to the needs of the State. Counties and cities complete the environmental regulatory network using local rules, regulations, ordinances, orders and zoning, designed to be very specific about local concerns.

The following sections summarize the Federal, State, and Local Rules and Regulations, as it relates to solid waste management. These rules and regulations define some of the constraints directly affecting the Barton County Solid Waste Management Plan.

5.1.1. Federal Legislation / Regulation

Solid and Hazardous Waste

The principal federally administered legislation affecting solid waste management is the Resource Conservation and Recovery Act (RCRA) of 1976 and later amendments. RCRA is intended to provide for complete regulation of municipal solid waste and hazardous waste management and encourage the conservation of material resources and energy by means of recovery, recycling, and reuse. Subtitle D of the Act, "State or Regional Solid Waste Plans," pertains specifically to municipal solid waste. The Hazardous and Solid Waste Amendments (HSWA) of 1984 directed the USEPA to consider the disposal of household hazardous waste and hazardous waste produced otherwise by small quantity generators which enter the municipal solid waste stream. The Water Quality Act of 1987 amended the Clean Water Act of 1972 to require USEPA to account for the co-disposal of sewage treatment plant sludge with municipal solid waste in landfills.

On October 9, 1991, USEPA published final regulations for the implementation of RCRA Subtitle D, Section 4004, which takes into account the 1984 and 1987 legislative mandates described. The purpose of the Subtitle D rules and regulations is to establish minimum national criteria for municipal solid waste landfills, including those used for co-disposal of sewage treatment plant sludge. These standard criteria include:

- Location restrictions with respect to airports, wetlands, floodplains, unstable areas, seismic impact zones, and geologic fault areas
- Design criteria including bottom liners and leachate collection and disposal.
- Operating criteria to include disposal prohibition for certain waste items and landfill gas collection.
- Groundwater monitoring for detection of releases.

- Financial assurance instruments for funding of closure and post-closure.
- Closure and post-closure care requirements.

A municipal solid waste landfill that does not meet the Subtitle D criteria within a specified time frame is considered to be an "open dump" in violation of Section 4005 of RCRA.

All existing and new landfills and lateral expansions to existing landfills in operation on October 9, 1993 (or April 9, 1994, if extended) must comply with all provisions of Subtitle D. Landfills which closed prior to that date were subject to the Subtitle D closure requirements only. The state of Kansas adopted the Federal Subtitle D regulations by reference in temporary regulations (KAR 28-29-98 and 28-29-99) on August 16, 1993. KDHE received primacy from USEPA for administration of the Subtitle D regulatory permit system prior to October 9, 1993.

Air Pollution Control

Solid waste management is substantially impacted by the Clean Air Act of 1970 and the Clean Air Act Amendments of 1990. The original 1970 Act required New Source Performance Standards (NSPS) which were intended for the control of particulates emitted by municipal waste combustors (MWC) or incinerators. MWCs were one of the first industrial emissions source categories to be regulated for heavy metal and toxic organic pollutants. The Clean Air Act Amendments of 1990 have mandated even more stringent emission controls on existing and new MWCs, requiring the use of "maximum achievable control technology" to reduce dioxin, furan, sulfur dioxide, hydrogen chloride, cadmium, lead, mercury, and oxides of nitrogen in emissions. The 1990 legislation calls for the state to permit programs as a method to control acid rain production, prevent significant deterioration of existing air quality, and regulate hazardous air pollutants.

The Federal Register of May 30, 1991, proposed rules and guidelines to implement the requirements of Section 111 of the Clean Air Act of 1970 pertaining to emissions of new and existing municipal solid waste landfills. Certain new landfills will be required to control emissions of non-methane organic compounds (NMOC) to a level achievable using best demonstrated systems for continuous emissions reduction. NMOC emissions are determined by calculations and depend on the total landfill capacity, the quantity of solid waste disposed of, and the volume of solid waste in place.

Water Pollution Control

The Clean Water Act of 1977 amended the Federal Water Pollution Control legislation as amended in 1972. Section 402 requires a National Pollution Discharge Elimination Program (NPDES) permit program. The permit system is designed to improve water quality by requiring compliance with minimum discharge standards. Sanitary landfills, subject to RCRA, Subtitle D, are required to have an NPDES permit for discharge of the stormwater runoff collection system (channel, conduit, pipe, ditch, etc.) to a managed water area (40CFR 122). Facilities involved in recycling of materials such as metal scrap yards, battery reclaimers, salvage yards, and automobile junk yards are also required to have NPDES stormwater permits. A point source NPDES permit as defined in the regulations is required for landfills which have leachate collection and/or treatment facilities on site which discharge to a managed water area.

Reclaimed Rubber

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 addresses the use of recycled tire rubber as a highway pavement additive. The law includes a requirement that each state certify annually as meeting a minimum utilization requirement for asphalt pavement containing recycled rubber. Section 1038 of the law ties federal funding of asphalt road construction to an annually increasing minimum use of scrap tire rubber.

5.1.2. State of Kansas Legislation / Regulation

Solid and Hazardous Waste

Solid waste management legislation is contained in the Kansas Statutes Annotated (KSA), Chapter 65 - Public Health, Article 34 - Solid Waste. The Kansas Department of Health and Environment (KDHE) administers the solid waste management statute through Kansas Administrative Regulations (KAR) Article 29, which details requirements and procedures. In addition, KDHE develops guidelines and technical standards on specific issues. Kansas administrative rules and regulations parallel their EPA counterpart documents, as USEPA - Subtitle D regulations. The Subtitle D regulations were adopted by the state on August 23, 1994, becoming effective October 24, 1994. House Bill 2801 adopted in 1992 and codified in the KAR in 1993 made substantial changes in the solid waste management planning process.

- Counties are designated as the local government entity responsible for managing solid waste.
- Counties must develop, adopt, and implement a solid waste

management plan, which must be reviewed annually, with a public hearing at least every 5 years.

- Cities can no longer opt out of the county planning and develop separate solid waste management plans; however, cities can carry out the planning process on behalf of the county if so designated.
- Makeup of planning committees may include representatives from Class I, II, and III cities, or be made up of the county commission alone (KAR Title 28, Article 29-76). The committee is limited to 30 members.
- A state solid waste management fund is set up with operation and disbursement procedures specified. The main source of funding is a state tipping fee charge of $1.00/ton of waste disposed.
- Specific goals and timetables must be established by Committees for volume reduction going to landfill for reduction activities.
- Counties may impose a fee of $25/ton on out-of-state solid waste. A county or regional landfill may levy a charge on waste disposal from a source outside the county or counties.

In addition to solid waste management planning, KSA 65-34 also regulates the management of used oil and medical services wastes. Hazardous waste management regulations (Title 28, Article 31) address standards for generators of hazardous wastes. Generators are classified according to the quantity of hazardous waste produced:

- EPA generator - any person generating more than 1,000 kilograms (2,205 pounds) per month and accumulating more than 1,000 kilograms (2,205 pounds) at any time.
- Kansas generator - any person generating more than 25 kilograms (55.1 pounds) but less than 1,000 kilograms (2,205 pounds) per month and accumulating not more than 1,000 kilograms (2,205 pounds) at any time.
- Small quantity generator - any person generating less than 25 kilograms (55.1 pounds) per month and accumulating not more than 1,000 kilograms (2,205 pounds) at any time.

Households are considered small quantity generators and are not subject to the hazardous waste regulation. Household Hazardous Facilities can be either a Kansas or EPA generator depending on quantities collected and quantities accumulated before disposal.

The Kansas Recycling Act of 1990 (SB 310) and implementing regulations (KAR Title 28, Article 29-28 to 29-36) establishes management of waste tires. The waste tire provisions include:

- KDHE requires a permit for waste tire storage sites unless the tires are for retreading.

- Waste tires must be disposed at a permitted facility.
- Whole waste tires can be used in a landfill leachate collection system; cut up tires can be used as daily cover at a landfill.

Air Pollution

KSA 65-3001 and KAR Title 28, Article 19 detail air quality standards and air pollution control regulations which parallel the provisions of the federal Clean Air Act. The standards and regulations pertain to waste incinerator emissions (28-19-40 to 28-17-43) and open burning of waste (28-19-45 to 28-19-47).

Other Legislation

Other legislation and regulations pertinent to solid waste management include the Kansas Non-Game and Endangered Species Conservation Act (KSA 35-501, KAR 23-17-2) which may affect siting of solid waste facilities; and Water Pollution Control (KSA 65-164) which administers the NPDES permit program. Kansas Historic Preservation Act (KSA 75-2716 to 2724) prevents waste management facilities from posing a threat of harm or destruction to irreplaceable historic or archaeological sites.

5.1.3. Barton County Waste Management Ordinances

No county ordinances regulating solid waste management have been enacted, and there are none currently in force.

5.1.4. Local Solid Waste Management Ordinances

Statutory Basis

Each city is authorized by KSA 65-3410 to provide for the storage, collection, transportation, processing, and disposal of solid waste generated within its boundaries. The law empowers cities to purchase, lease, or contract for all necessary equipment, land, and facilities for solid waste management. Fees can be levied on persons receiving services in the jurisdiction. Cities may adopt ordinances, resolutions, regulations, and standards for the storage, collection, transportation, processing, and disposal of solid wastes. Local ordinances must conform to the rules, regulations, standards, and procedures adopted by the Kansas Department of Health and Environment.

Model Ordinance Content

Solid waste management is essential to protect public health, safety, and the environment. Effective local ordinances provide a public service to minimize health hazards and regulate the storage, collection, and transport of solid wastes. Local ordinances can also include minimizing and separating of solid waste generated in the community to encourage volume reduction and recycling.

Such local ordinances should ensure that adequate provisions have been made for the processing, storage, and marketing of materials prior to enacting the ordinance.

In general, local ordinances should address the storage, collection, transportation, processing, and disposal of solid waste.

Storage

Local ordinances should:

- require complete enclosure of solid waste in durable, leak resistant containers that protect the contents from weather, and inhibit the attraction of animals and vectors. Reusable containers must be clean and durable, and single service containers must be durable enough to withstand a single use. Containers to be manually lifted should not exceed 15 gallons in capacity or weigh more than 75 pounds when full.
- require bulk containers, such as those provided by a private contractor for the use of multi-families dwellings or businesses, be regularly cleaned and maintained. Containers provided to local residents for home collection should be maintained by the resident.

Collection and Transportation

Local ordinances must:

- state the type of service available in all portions of jurisdiction and note any differences in areas served by different or alternative types of collection methods.
- provide for the local regulation and control of persons engaged in the business of collecting and/or transporting solid waste.
- state who receives collection services, where the waste is to be collected (e.g., curbside, alley) and the providers for all in the plan area.
- state where residential waste is to be collected (e.g., curbside, alleyway, or highway) and the frequency of collection.
- give specifications for collection/transportation vehicles to be used. Acceptable solid waste vehicles should have covered bodies that are leakproof, cleanable, and prevent scattering of refuse. Also, these vehicles should have the company name, address, phone number, vehicle number, and DOT number, clearly visible on two sides of the

vehicle.

Recognition must be given to potential problems of commercial and industrial waste accumulation. Local ordinances should have provisions requiring routine removal of solid wastes by the property owners/operators and/or special provisions for waste abandoned on private property complete, with relative enforcement provisions. A minimum collection standard of once a week is necessary for waste containing putrescible materials, exceptions can be made for waste which does not cause odors, create a vector problem, pose a fire hazard, environmental problems, is unsightly, or constitutes a nuisance.

Processing and Disposal

Local ordinances should:

- require processing and disposal of residential waste in a manner that will not cause public health and safety hazards, nuisances, air and water pollution, degraded land values, nor unsightliness.
- develop policies to reduce open burning of wood waste through alternative methods (pallet recycling, chipping, mulching, grinding, composting, etc.). Open burning of residential solid waste by residents is an undesirable method of volume reduction in urbanized areas and should be discouraged.
- provide for enforcement of ordinances or regulations prohibiting illegal dumping of solid waste and assure cleanup of all illegal dump sites.

If solid waste is transported to a processing or disposal facility in another county or state, the processor for disposal must have a valid operating permit issued by that state's solid waste regulatory agency.

Management

Local ordinances should:

- specify a municipal office or department responsible for the solid waste management system. This office will be responsible for complaints, enforcement, collection contracts, special/hazardous waste handling, and other problems associated with solid waste management.
- identify all internal governmental entities involved in solid waste management and planning (e.g., committees, commissions, public works, health, and sanitation, planning and zoning agencies, etc.). The nature of their relationship should be explained, and reporting requirements established.

- contain a statement of policy and a section containing definitions of technical terms used in the text to provide clarity of intent.

5.1.5. Analyzing Local Ordinances

The County will analyze local ordinances using the following minimum criteria for local ordinance content:

- Definitions to clarify meanings of terms.
- Putrescible wastes storage containers or bags that restrict access by animals, vectors, and weather.
- Waste storage areas requirements to set cleanliness standards.
- Putrescible solid waste is properly managed or disposed of at a minimum of once per week.
- Disposal of hazardous substances which may adversely affect the health and safety of the solid waste collectors or contaminate the environment is prohibited.
- All processing facilities and disposal areas used will have appropriate local and state permits.
- Vehicles used to collect and transport solid waste are regularly inspected, kept in a clean and sanitary condition, and covered to prevent littering.
- Generators of bulky waste are required to arrange for collection and proper disposal.
- Open burning of garbage and putrescible is prohibited inside incorporate limits.
- Responsible officials are designated, and responsibilities are clearly indicated. Penalty assessments for violations of the local solid waste management ordinances are provided.

5.2. Future Constraints

The following discussion highlights some of the major future constraints which the solid waste system must either adapt to or overcome.

5.2.1. Available Land and Land Use / Zoning

Typical of Kansas, Barton County does not have a shortage of land. There are several population centers where the siting of various solid waste facilities would either be advantageous or unlikely. The county's low population density limits the need and ability for the County to offer a comprehensive solid waste management system. Inherent inefficiencies resulting from providing services to sparsely populated areas will be a

limiting factor. Additionally, a major constraint relating to the land location is the groundwater level. Barton County has large areas where the groundwater table can be 20-40 feet subsurface (northern part) and other areas at 5-10 feet (southern). The current land use for the county ranges from residential (single and multi-family), commercial (retail and service industries), industrial (light and heavy) in the municipalities to agricultural in the unincorporated areas.

5.2.2. Transportation

As discussed in Section Two, Barton County has an extensive road network. Barton County maintains 375 miles of paved roads. The road system serves as connection routes for rural areas and access to incorporated and unincorporated communities. The main roadways within the county can support the travel of solid waste vehicles.

5.2.3. Regulatory Impact

The major regulatory constraint will be the Subtitle D solid waste regulations. Subtitle D restricts location of sanitary landfills, requires the use of composite liner systems, require regular monitoring, and require post-closure care. The result of Subtitle D is the cost for landfilling solid waste will increase significantly over present costs. The number of landfills which exist will be a small fraction of the number that existed in the past, but the need for landfill space will increase. Barton County's Subtitle D landfill meets state and federal standards. The County can continue to operate at the current landfill for the next 60-80 years. New standards could severely limit the number of potential locations where a new landfill facility could be sited at some point in the future.

In addition, Federal solid waste disposal requirements, the State of Kansas statutes, and regulations, requires the proper management of used motor oil, waste tires, medical wastes, special, and hazardous wastes. The Kansas Regulations codify what are becoming standard operational practices for the proper management of these wastes. The major impact of these regulations is that additional environmental and public health safeguards may be required, with the probability of increased costs coming for the management of these wastes.

The air pollution control regulations place significant limits upon the discharge of contaminants through incineration. Additionally, under the proposed rules being promulgated under the Clean Air Act, new landfills may be required to control emissions of landfill-gases. These regulations to control hazardous emissions from the incineration of MSW, have the

impact of making incineration a rather expensive and time intensive prospect because of the emissions control equipment which must be installed and the monitoring requirements. The proposed emission regulations on landfills could have the impact of greatly increasing landfilling costs because of the new emission control requirements, of reducing the size of landfills to avoid the requirements or limiting the types of materials to maximize the volume of waste that can be excepted and come in under the emissions ceiling.

The Clean Water Act, through its NPDES program, requires that the stormwater runoff from any solid waste facility must be managed. This results in the need for extensive surface water control structures. However, these requirements have existed for over 15 years and are now a part of the normal permitting and design process. The various regulations which govern wetlands, non-game and endangered species, and historical and archaeological sites may or may not have an impact on the solid waste system within Barton County. Certainly, a study of these limitations will have to be performed on a site-by-site basis before any major program commitments are made.

5.3. Future Needs of The Planning Area

Barton County has several significant solid waste system needs which must be met in order to provide for the health and safety of its citizens. The county's environmental objective of preserving the environment while at the same time providing for its citizens and promoting economic growth must be the driving force in selecting the solid waste system. The major needs which have been identified for the solid waste system are listed below:

- Provide the means for long-term disposal of solid waste.
- Provide an infrastructure for recycling of various materials commonly found in the solid waste.
- Provide an infrastructure for composting of yard waste and other organic materials to obtain a useable product from the waste stream and an additional means to reduce the volume.
- Provide management systems for household and exempt hazardous wastes and special wastes in an economically and environmentally sound manner.
- Ensure that solid waste collection services are available to all who need or wish to have such services, particularly in rural unincorporated areas.
- Provide an infrastructure for waste reduction and reuse since these alternatives are becoming recognized as the most affordable and environmentally preferred means to manage the waste.

- Ensure that adequate county and local government regulations are in place to help achieve environmental objectives while placing a minimum burden upon citizens and businesses.
- Provide education to community leaders and general public regarding the necessity of participating in solid waste system and the resulting benefits to public health and the environment.
- Provide adequate staffing to achieve environmental goals and assist with the implementation of solid waste management system components.
- Provide adequate financing for implementation of solid waste management system components.
- Continue to divert additional material from the solid waste stream through recycling.

6. SOLID WASTE TECHNOLOGY ALTERNATIVES

6.1. Applicable Component Technologies

6.1.1. Storage Systems

There are several adequate systems available for the on-site storage of solid waste. The goal of the storage system is to manage solid waste at the point of generation in a sanitary manner. Storage should only be for a short period, generally, the time between scheduled trash collections. Different storage types are available for both residential and commercial/industrial solid waste generators. For residential generators, the most common storage systems are:

Plastic trash bags

- Plastic or metallic 20-to-35-gallon containers (trash cans).
- Plastic 90-gallon containers on wheels (curb carts).
- Wet-strength 20-to-30-gallon Kraft paper bags.
- Dumpsters up to five cubic yards (multi-family dwellings use).

In addition to the above, commercial/industrial generators may include such storage systems as:

- Dumpsters up to eight cubic yards.
- Roll-off containers between 10 and 40 cubic yards.
- On-site compactors for dumpsters or roll-offs.
- Balers.

The storage system is generally dictated by the following factors:

- Available vehicle collection equipment.
- Frequency of collection; wastes that create odor problems require more frequent collection.
- Quantity and/or density of waste produced.

Location of the storage system is an additional concern. Common locations include: rear of residences or facilities, curbside, enclosed locations, alleys, or at points of generation. Additional considerations in the location of storage containers include the convenience of placing waste in the container, the ease of collection, and the ability to maintain the area in a sanitary manner.

No matter which system is recommended, the goal is the same: to store the trash in a sanitary manner minimizing insects, rodents, vectors, and the weather, as well as minimizing odor and visual nuisances.

6.1.2. Collection and Transportation

The collection and transportation of solid waste involves movement of the waste from the point of generation to the disposal site (landfill), or a recycling facility. The collection system is important to the types of storage systems that can be used. Collection programs designed with recycling in mind provide the means whereby waste can be segregated into pure source separated recyclables, commingled recyclables, yard waste, and special waste. The location where the trash is collected is a function of the storage system as well as the collection vehicles. Collection equipment frequently includes:

- Rear loading compactors.
- Side loading compactors.
- Front loading compactors.
- Roll-off trucks.
- Flatbed trucks with ramp or lift gates.
- Dump trucks.
- Truck with brush chippers.
- Compartmentalized side loading recycling trucks.
- Compartmentalized recycling trailers.

The frequency of trash collection has a major impact on the type of storage system utilized. Usually, urban areas receive trash collection service at least once per week with rural areas receiving service bi-weekly. Recycling, yard waste, and special waste collections can range from the same frequency to once a month or an on-call basis.

A collection system can be operated by a municipality or a private firm. A variety of operating systems exist including:

- the municipality using its own forces.
- the municipality contracting with a private firm.
- the municipality offering franchises to provide the collection.
- Individual households and businesses contracting directly with private firms.
- self-hauling.

There are several benefits and disadvantages of each operations mode. In reality, the political situation as much as anything determines what type of collection system will be used. In Barton County, there are currently municipal operations, municipal contracts, individual contracts, and self-hauling.

Another collection issue addresses whether the services should be mandatory or voluntary. It is common in urban settings that collection services are mandatory. Provision may allow individuals and firms to take their own waste to the disposal area. While it is typical to find subscribing to collection services voluntary in rural areas. Ensuring collection services are available in small towns and rural areas is of considerable concern in Barton County. Among the solutions available are:

- Mandatory collection services. Each household, multi-family dwellings and business must subscribe to a collection service. The governing body must assure that service is available at reasonable rates.
- Municipal provided service. The municipalities would use in-house forces or contract services to provide collection services.
- Franchise and/or license collection services. The municipality would require all collection services have either franchise agreements or licenses. A provision of approving the franchise/license could be that the collection services must be offered to the rural areas or a portion thereof.
- Community drop-off areas. The municipalities could set up community drop-off areas to consolidate solid waste and recyclables. The ideal situation would set a variable rate for disposal, the more you throw away the more you pay, therefore encouraging recycling.

The object of any rural collection program is that it must be both convenient and reasonably priced. Should centralized locations be selected, the maximum travel that an individual might reasonably be expected to travel should be no greater than ten miles. Ideally,

centralized locations would be where people shop or perform other routine tasks, becoming intertwined with normal activity, not an extra activity.

6.1.3. Processing Systems

In some instances, it is advantageous to process the solid waste to gain an improvement in quality, quantity, economics, health, or nuisance protection. KDHE recognizes the following as some potential biological, chemical, and physical processes:

- Grinding
- Separating
- Shredding
- Reuse
- Baling
- Incineration
- Composting
- Crushing
- Chemical Stabilization
- Source Reduction
- Land Application
- Melting
- Wet Oxidation
- Recycling
- Pyrolysis (chemical decomposition with heat)

For the purpose of this discussion, source reduction, reuse, recycling, and composting will be covered in the next section. Separating, chemical stabilization, melting, wet oxidation, and pyrolysis will be discarded as options, because they are either too expensive or not practical for the situation in Barton County. Grinding and shredding are similar technologies, with the waste material being reduced from a larger sized material to a considerably smaller, more manageable size. These operations tend to be energy and personnel or capital equipment intensive and require considerable maintenance. The smaller material becomes easier to handle and ultimately compact. Shredding is frequently used at incineration facilities to hasten the combustion process.

The principal of crushing and baling is essentially the same, with the idea being to compact the waste materials to an easier, more manageable form. Crushing is usually associated with automobile, glass, oil filter, and tin can recycling. Baling, however, is usually associated with general trash disposal or paper, cardboard, and textile recycling. The baled material is tied with baling wire and becomes more manageable for forklifts and can be containerized for rail or semi-truck trailers or can be loaded on conventional flat-bed semi-truck trailers. Several trash balefills exist throughout the United States, where baled waste is stacked neatly into the landfill. Balefills typically do not require daily cover nor is compaction required at the landfill. The object of crushing and baling is to produce a more compact product which can be shipped or landfilled

more efficiently. The capital cost and operating expense of baling is normally not cost effective for waste being hauled to a landfill except for in cases of long-distance disposal or in areas where landfill space is at a premium.

Considerable interest has been shown in other counties with the feasibility of operating an incineration unit with energy recovery capabilities. It is thought that the economics, public acceptability, the monitoring equipment maintenance, and regulatory hurdles required to site and build a WTE facility make its feasibility and desirability doubtful.

Composting involves the process of biological decomposition and degrading organic matter into a humus like material which can be used as a soil amendment. Yard and food waste are candidates for composting processes. The process can be as simple as reducing the material and placing it into large static piles and turning the piles with equipment such as a front-end loader to prevent molding. A methane containment and extraction cover and perforated pipe aeration systems can be added below the pile to provide oxygen as needed and to remove the methane gas and odors. Other forms of composting include: Windrowing - placing the material in long rows and turning with specialized equipment; Enriched composting - using manure or dewatered sewage or POTW (Publicly Owned Treatment Works) sludge; or Enclosed vessels - to control the environment of the compost. A recent addition to composting is worm-a-culture using enriched compost and worms to enrich and speed up the decomposition of the waste. The composting process requires careful management. Materials going in must be clean of foreign materials and non-toxic vegetation, then carefully mixed to control odor (especially grass) as well as closely monitored for moisture content. The two most common composting practices are the static piles and windrowing.

Land application of waste materials is becoming an increasingly popular way to manage POTW sludges, certain other special wastes, and pelletized paper. There are strict regulations on the quality of material being land applied. The main objective of land application is returning safe, nutrient-rich end products to the soil where they can be of benefit to agriculture.

6.1.4. Source Reduction, Recycling, and Reuse Systems

Recycling and reuse activities are fast becoming recognized as critical components of any solid waste management system. Because of the transport distances in the Midwest and the comparatively low-density

populations, recycling at best is a break-even operation for the community. The original Barton County SWMPC goal of diverting 20 percent of MSW from the County landfill by the year 2005 was achieved in 2002 by recycling and composting activities. However, the Barton County SWMPC would recommend further reduction of solid waste through recycling efforts.

Source reduction and reuse requires education and a change of buying habits of businesses and the public. Public education should utilize the media by means of: advertisements in newspapers, television, social media, and radio, posters, stickers, buying guides, and special newsletters. Additionally, brochures should be available which describe waste reduction techniques.

Community support of source reduction and reuse activities can have a significant impact on the solid waste stream. As discussed in Section 4.2.3., Material Recovery, reuse activities include resale of used clothing, repair of old appliances and clothing, and other salvage activities and are widely practiced in Barton County.

An important sector of source reduction and reuse activities are those in which businesses and industry participate. Most environmental activities in which businesses participate are regulatory driven, i.e., meeting emissions or manifesting requirements. Source reduction can be promoted to business in terms of enlightened money-saving opportunities. The USEPA uses the term "pollution prevention" to describe business and industry participation in source reduction. The key is that when a waste is eliminated, it reduces handling, direct costs, and is a reduction in the cost of disposal, an overhead expense.

It is apparent by the limited use of drop-off recycling facilities, recycling needs to be promoted. A major concern with any recycling system is the type of collection system and MRF required. Two common types of collection systems for consideration are:

- Separate collection of waste and recyclables. The recyclable materials are collected curbside or at centralized locations and are sorted at the point of collection or at a MRF. Processing requirements may include sorting, baling, and crushing of the collected materials. A major drawback to this system is that two or more collection vehicles must travel each route to collect separated recyclables and non-recyclables.
- Co-collection. The mixed recyclable materials are co-collected at the curbside or at central locations. Typical programs include blue bag

collection programs where special colored plastic bags are used for the recyclables. At the MRF, the mixed load is discharged on the tipping floor, and the blue bags are separated from the remaining waste. Then, the mixed contents of the blue bags pass a series of sorting processes which separate the various materials, and the materials are finally prepared for market. A major drawback to this type of system is that an estimated 10 to 20 percent of the blue bags are either damaged or not recovered. This system saves collection expense by only having one collection vehicle to service a route.

Based upon the two collection scenarios, it is easy to see that different style MRFs will be required for different collection schemes. The type of equipment, size, and capital and operation costs differ substantially among different schemes.

6.1.5. Disposal Systems

Early in the planning process, Barton County examined the feasible alternatives for disposal technologies. Five alternatives were identified. These alternatives along with the initial evaluations including estimated tipping fee, estimated development time, technical complexity, regulatory issues, liability issues, applicability for multi-jurisdictional, and private sector participation are presented in Section 6.1.3. It was determined to limit the consideration to only three of the alternatives:

1) Subtitle D sanitary landfill.

2) Transfer station with remote landfill.

3) MRF and transfer station with remote landfill.

Further scenarios developed in the plan about disposal concentrated primarily on these three scenarios. A summary of each technology is included in the subsequent paragraphs. A Subtitle D sanitary landfill would maintain the county's current disposal system. A new cell must have a composite liner of both geomembrane and compacted soil. Additionally, a leachate collection system is required to capture any liquid produced. A composite cap of both geomembrane and compacted soil will be required at the time of closure. Additionally, landfill gas will have to be managed. Finally, an extensive network of monitoring wells for both groundwater and gas migration will be required. This type of facility is consistent with the current county operations. The county appears to own all the necessary equipment and have sufficient trained staff to operate

this new landfill. The liabilities associated with owning a landfill, including maintenance during the post-closure period, become a concern.

A transfer station with remote landfill would allow transport of waste to a low-cost Subtitle D landfill located outside the county. This alternative would involve the construction of a transfer station facility and purchase of equipment to handle the waste prior to being placed into transfer trailers. The value of a transfer station is that collection vehicles can maximize time on route and minimize off route time. Additionally, with all waste consolidated, volume discounts should be available from most landfills. The potential for future liability is reduced because there are more potentially responsible parties. However, Barton County would have little or no control over the landfill design and operation.

A MRF and transfer station with remote landfill provides the same advantages as the regular transfer station along with the benefits of having a MRF as discussed in Section 6.1.4. Major considerations with operating a MRF and transfer station are: similar equipment used in both operations could be shared; collection vehicles would be traveling to a centralized location. An additional advantage to operating a MRF is more control in minimizing waste and saving transportation and disposal costs.

6.1.6. Future Disposal Possibilities

The option of siting a Materials Recovery Facility at the Barton County Landfill was not examined due to the cost and the small population of the county.

6.2. Selection of Options

To select the appropriate options for both consideration and implementation, it is necessary to evaluate the options. Among the factors that must be considered are the following:

- Public acceptance
- Environmental impacts
- Economic impacts
- Social impacts

Public acceptance of any solid waste management system component is a critical measure of its success. Without public support, programs like recycling or composting could not be implemented nor could facilities like a MRF or landfill be built. It will be important to consider

with each alternative the willingness of the public to use and support the alternative.

Each alternative will have the potential for significant positive and negative environmental impacts. It will be necessary to attempt to balance the impacts on all environmental media. Consideration needs to be given to the impacts on air, water, and land. Value judgments will be required to select the alternatives having the least impact on all media.

Each alternative will have an associated cost and benefit. Unfortunately, with most solid waste systems it will be extremely difficult to quantify the benefits with much precision. Therefore, value judgments will be required to determine the point at which the costs outweigh the benefits.

The social impact of any proposed alternative must be considered in terms of how society may change. Although it is possible that an alternative will promote positive societal behavior like increased environmental awareness, it also may promote negative behavior such as illegal roadside dumping. The social impact is very closely related to the public acceptance.

7. SOLID WASTE SYSTEM OPTIONS

This chapter includes descriptions and discussions of the various storage, collection and transportation, processing, recycling and reuse, and disposal system options. Approximate costs for the various options will be discussed. For more detailed cost information on the recommended options, see Section 9.

7.1. Storage Systems

Several potential storage system options were discussed in Section 6.1.1. The most commonly used storage systems for residential generators ranged from plastic trash bags, to curb carts, or dumpsters. For commercial/industrial generators, the most commonly used storage systems ranged from cardboard drums to plastic trash bags, dumpsters or roll-off boxes. The goal must be to store the waste at the point of generation, in a convenient, safe, and sanitary manner with a minimum of environmental impacts.

7.1.1. Storage System Constraints – Measures to Overcome

The constraints associated with storage systems (Section 6.1.1) were as follows:

- Available collection equipment.
- Frequency of collection.
- Quantity of waste produced and/or density of waste generated.

These constraints are determined mainly by the nature of the available collection system and waste generation occurring in the county.

Barton County plans to continue to encourage recycling programs and the possibility of a county-wide collection system. Therefore, the selected storage system option must be flexible enough to accommodate the currently used systems of existing waste generators and projected generators in the County.

7.1.2. Recommended Storage System Option

The recommended storage system for Barton County consists solely of adherence to criteria for on-site solid waste storage discussed in Section 5. It is recommended that all communities adopt local ordinances which meet the minimum criteria of the model ordinance. This is the most practical way of achieving public acceptance along with minimizing the environmental, economic, and social impacts. This allows the free market and local decisions to select the appropriate collection system and the appropriate storage system. Additionally, it is recommended to include the unincorporated areas. The County Commission will need to adopt a resolution which includes these minimum storage requirements and an appropriate enforcement agency. To measure the effectiveness of the recommended system, it will be necessary to monitor the number of complaints and violations. Each community with storage system requirements should be evaluated annually through reporting the number of complaints and violations to the Barton County Solid Waste Management Planning Committee.

7.2. Collection and Transportation System

As discussed in Section 6.1.2, several collection and transportation systems are available. The main variables of the collection and transportation system include:

- Types of materials collected.
- Locations from which wastes are collected.
- Types of collection equipment.
- Frequency of collections.

- Operating agency.
- Mandatory or voluntary participation.
- Servicing small towns and rural areas.
- Collection and transportation of special wastes.

For the purpose of this plan, it will be assumed that the governing body and market forces, to some extent, will determine the location of waste collection, type of collection equipment, frequency of collection and the operating matters. Municipalities may choose to operate their own system, contract for collection, or allow their citizens to select a collection firm on their own. This flexibility will promote some competition and efficiencies which results in an economically sound system. However, as discussed in the recommendations section, minimum sanitary standards will be established, which must be followed by all county residents and all collection entities. Additionally, the types of materials to be collected will be discussed in further detail in Section 7.3.

7.2.1. Collection/Transportation System - Constraints

For public health reasons, it is advantageous to require mandatory waste collection services. By requiring either municipal or private collection services, it is possible to enforce public health regulations. Regarding the issue of mandatory or voluntary collection services, a major constraint is public acceptability. Mandatory requirements tend to be publicly opposed specially by rural residents. In most urbanized areas, residents come to expect their trash will be collected or services be offered to them. Rural residents have more options and would rather decide what type of service works best for them. Generally, these waste generators will use the collective solid waste services only when they feel there is a significant environmental or social reason to do so, or when they feel the economics or extra efforts are not burdensome. Servicing small towns and rural areas will be a difficult task. The major constraints to servicing these people are described below:

- Low population densities. The number of stops collection vehicles make in a given time period is severely limited, resulting in inefficient use of the collection equipment as well as expensive service.
- Limited access on road systems. Unimproved roads make it difficult for collection vehicles to either traverse in a time efficient manner or even travel at certain times of the year.
- Public acceptability. As discussed earlier, rural residents tend to see themselves as self-sufficient and may not wish to participate in solid waste collection services.
- Lack of solid waste collectors. Since privately operated services are

in the business to make money, they may be unwilling to service low population density areas.

7.2.2. Collection/Transportation System - Measures to Overcome Constraints

Collection and transportation constraints can be reduced by allowing flexibility in the system. To overcome these issues, a number of options are available to Barton County. Six options are described below.

- Option 1 – Maintain Status Quo. The current solid waste system has some rural areas being serviced by at least one collection entity. A large portion of rural households are managing solid waste themselves. These people either self-haul to the landfill or handle the waste on their property (i.e. – burning, burying). This option would add no cost to the current system nor any administrative supervision other than enforcing public health regulations.
- Option 2 – Mandatory Collection Service. This would require all waste generators to participate in a solid waste collection program. This would create an increase demand for services, but the cost could exceed the wants or needs of the public. Additionally, public opposition could inhibit implementation. One solution for resistance to mandatory participation may be to allow voluntary participation in rural areas with mandatory requirement in denser areas only. Enforcement of mandatory collection would be a significant duty. Required efforts from personnel may not be justified.
- Option 3 - County Provided Collection Service. By the county either providing or contracting the collection services, they would be able to exert control over how the waste is collected and where disposed. This option could be funded through property taxes, utility bills, or other variation and of universal collection services. By offering the service at "no cost", participation will be higher. The major benefit with this option is the reduced collection truck traffic on roadways. This type of trash service funding is successful in many counties and municipalities.
- Option 4 - License Collection Services. By issuing licenses to haulers servicing Barton County, the County could exert certain control over the haulers. One provision could be to require the hauler to service a certain number of rural residents. Other advantages include requiring the licensee to report a customer base annually, collections vehicle could require inspections and restrict collection procedures. A major disadvantage to this system is having multiple collections vehicles down the same roadway causing excessive wear.
- Option 5 – Franchise Collection Service. By franchising solid waste

collection, the County would designate certain areas where haulers would have exclusive rights to collect the solid waste from generators within that area. Collection entities would be prohibited from servicing outside their designated area, limiting damage to roadways, competition and providing economic advantages. The agencies could be required to annual permitting and inspections as discussed under the licensing option. The major disadvantages are there is no assurance that all persons will in fact receive solid waste collections services; residents' antagonism with the agency assigned to their area; franchisee unwillingness to service unprofitable areas.

- Option 6 – Community Drop-Off Areas. This would involve the establishment of approximately three centralized collection centers. These drop-off stations could be operated anywhere from once a week to daily. Dumpsters could be located at regional gas stations, convenience stores or other places frequented by rural residents. Being that the dumpsters are mobile, they could be located on a rotational cycle in different regions in the county. If manned, a user fee could be collected to make the drop-off operation self-sufficient. Recycling services could also be offered at these drop-off areas. A disadvantage is participation would still be voluntary.

To address the issue of collection of special wastes, it will be necessary to have a multifaceted approach. Since there are a variety of special wastes, separate and different programs will be required for each category of materials.

Abandoned vehicles have not been a significant issue in the county. It appears that the existing infrastructure to handle these vehicles is adequate. The county or local entity assists with the proper disposal of abandoned vehicles by informing the public through various programs about where abandoned vehicles are to be disposed. In the event that abandoned vehicles are being stockpiled on any piece of property and pose a threat to the public health, welfare, or safety, the appropriate agency will notify the property owner to mitigate the problem. Since there appears to be adequate means for collecting and transporting this type of waste, no additional means of collection or transportation is needed.

Agricultural wastes, including dead animals, will continue to be managed in the same manner as they are presently handled by the generator. Since the agricultural community already has sufficient means to collect and transport it's wastes, there is no need for additional means of collection or transportation.

Construction and demolition wastes will continue to be managed in the same manner. Further discussion about the disposal of C & D waste is

included in the next section. Considering on-site management and self-hauling, changes in the way C & D wastes are managed do not appear necessary.

Forestry wastes are not generated in any large quantities, except during major storm events. Currently, these arbor materials are being managed by burning or chipping to reduce volume. It is expected that the county will continue to manage these wastes in the same manner, therefore no additional collection or transportation program will be needed for these materials outside of emergencies.

For the proper management of Household Hazardous Waste, the county operates a HHW facility. This will remain the primary method available to all county residents and residents of counties contracting with Barton County. The facility, with regular and special collections, will collect, package and ultimately ship the HHW collected to licensed facilities for disposal. The continued use of the permanent facility will provide for proper management, including diversion and recycle, of all HHW received.

As discussed in Section 3, a minimal amount of sludges and septage wastes are being land applied or disposed of at the County landfill. The collection and transportation of these special wastes are being handled by their generators or by specialty contractors. There is no need for additional collection or transportation of these wastes.

Collection and transportation of waste tires and white goods are a concern to the County. While outlets are available at the County landfill, the sites are not being fully utilized, either because of disposal costs or transportation difficulties. Many Barton County communities offer an annual city-wide "clean-up" program, where transportation and disposal services are offered for these and other types of wastes. Barton County will continue to provide support to these communities offering such collections by providing reduced rates on disposal fees. Another option may be to include the collection of these materials at the drop-off sites on set schedules such as once a month or quarter, depending on needs and volumes.

The collection and transportation of used motor oil will remain the responsibility of the industrial generators. However, the HHW facility accepts used motor oil for recycling. The county will continue to inform the general public of this service.

7.2.3. Recommended Collection and Transportation System Option

The recommended collection and transportation system option is Option 1 – Maintain Status Quo. This option would add no cost to the

current system nor any administrative supervision other than enforcing public health regulations.

7.2.4. Evaluation Method for Recommended Trans./Collection System

To measure the effectiveness of the recommended system, it will be necessary to monitor the number of households that receive trash collection and where people are unable to have easy access to a trash collection service.

Additionally, it will be necessary to monitor the utilization of the different special wastes and the HHW permanent facility program.

7.3 Disposal Systems

For a clear understanding of the disposal system, one must understand the components of the system: the collection, the processing of recycling/reusing, and disposal, are combined for a complete disposal system. Section 6.1.3 through Section 6.1.5 describes several applicable methodologies and processes for this disposal system. The methodologies employed in any disposal system listed source reduction, recycling, reuse, composting and as a last resort, incineration. The physical processing options used to reduce, reuse, recycle or compost, ranged from separation, to grinding, shredding, baling, crushing and land application. While the chemical or heat processes included: chemical stabilization, wet oxidation, separation, melting, incineration, and pyrolysis. The disposal options were limited to landfilling even though it would be possible to transfer out of county any or all of the waste if the economics made it attractive or if the materials were being shipped to a MRF. The goal of any complete disposal system is to provide a means for handling, processing, and disposing of all solid waste materials.

For the purpose of this discussion, assumptions will be made about the percentage of materials that will be recovered in any source reduction and/or recycling programs. Tables 7-1 through 7-5 show targeted participation and captured rates for the various programs. Participation rates describe the percentage of people or businesses which take part in any program and contribute the particular material. The capture rate describes the percentage of each material that an individual generates which is contributed to the diversion program.

7.3.1 Disposal System Constraints

The major constraint associated with the complete system is providing services at a reasonable cost. An additional concern relates to whether

the required participation rates can be achieved to reach the county's diversion goal.

7.3.2 Disposal System Measures to Overcome Constraints

The key to overcoming the disposal system constraints is to contain cost. The current voluntary recycling program will continue. In addition, residents should be encouraged to participate through a more active public education and outreach program. A major focus of this program could be to point out to residents that the cost of landfilling is considerably higher than to reduce, separate and recycle. In addition, the County has implemented a composting program. Grass clippings and some other small green wastes are composted and either generated into daily material or used in reseed/planting areas. The following costs are for the operation of the current landfill for the next year.

Table 7-6

Current Costs for Barton County Sanitary Landfill (2025)

Site area	**380 acres**
Fill area	**28.6 acres**
Average tipping fee	**$42.00 per ton**
One time closure costs per acre of fill	**$179,956.22 per acre**
Annual long term post-closure costs per acre of fill	**$140,863.43 per acre**

7.3.3 Evaluation Method for Recommended System

It will not be possible to measure the effectiveness of the Subtitle D sanitary landfill. However, the utilization and demand for recovery/recycle facilities will need to be monitored. Additionally, the use and demand for yard waste disposal services will need to be monitored to determine the need for a more sophisticated approach to composting.

Recommended Administration and Operation

In general, the administration and operation of the existing Barton County Solid Waste Management System is adequate. However, the institutionalization of the BCSWMPC and the addition of some county staff area required. The Barton County Solid Waste Department is the primary agency involved in the management of solid waste with support from the following County agencies:

County Engineer (design)

County Counselor (legal support)
County Commission and Administration (budgeting and policies)
County Extension (public education)
Sheriff's Department (enforcement)

Additionally, all incorporated communities have authority to operate or contract for solid waste services and regulate solid waste within their boundaries. It is recommended that the BCSWMPC be made a permanent commission of Barton County which will meet at least annually. The BCSWMPC will maintain a composition prescribed by the state law with members representing incorporated communities, county staff, and other appointed representatives from within the county. The BCSWMPC would meet to perform the following tasks:

- Annual review and updating of solid waste plan.
- Advise the county on solid waste policies.
- Advise the county on solid waste budgets.
- Provide community feedback to the county solid waste managers.

The responsibility for county solid waste management will remain within the Department of Solid Waste. The Solid Waste Director is responsible for the administration, management, and coordination of the Subtitle D landfill and HHW facility, special waste disposal, public relations and any other programs developed through this plan. In addition, the Department of Solid Waste would be responsible for public education, public health regulations, permit compliance and other regulatory activities.

Barton County Counselor will continue to be involved with drafting any solid waste regulations and offer opinions required regarding solid waste. The employees are accountable. They will oversee all aspects of the solid waste system and set all solid waste policies. The Sheriff's Department will be requested to issue citations and other legal documents when individuals are violating county regulations. The Extension Office will be utilized for public education and informational programs. County staff will be used as required in solid waste management system operations, including the Barton County Road and Bridge to assist with maintenance of equipment and provide additional personnel and equipment when required.

Cities will continue to have home-rule authority and administer their own programs and take local actions as necessary for their solid waste system. Privately owned entities such as trash haulers and recyclers will remain responsible for their own administration and operation. These independent organizations will be called upon to help the county meet the goals of this plan.

Overall, the administration and operation of the Barton County Solid Waste Management System will require teamwork among many different organizations. It will ultimately be the responsibility of the Solid Waste Director, acting on behalf of the County Commissioners, to ensure the county's solid waste is being managed in the best interest of its citizens.

7.4 Evaluation Method for Recommended Systems

The following criteria from the KDHE draft Outline for Kansas Solid Waste Management Plans, March 1993, will be used during the plan's revisions to evaluate effectiveness of the recommended systems.

Resource Conservation. How effective the solid waste system encourages source reduction, recycling, and other similar programs.

- Aesthetics. How effective the solid waste system will minimize the sensory perception of the solid waste system, including such factors as unsightliness, odors, and noise, during all phases from storage to disposal.

- Economics. Measures the real cost of providing the solid waste services in terms of both direct costs which a citizen pays as well as the indirect costs for services which a citizen must provide but is not reimbursed for. The criteria include such things as monthly service charges, bulky waste collection, and revenues from recovery operations.

- Flexibility. Measures the ability of the system to conform to changing needs of the community. Factors such as population growth, shifts in population centers and changes in commercial and in industrial area locations; changes in the characteristics of the refuse; and adaptability of new technologies. In addition, this criteria includes the ability of the system to adapt to future social and political changes without significant degradation of services or increases in costs.

- Health and Safety. Measures the degree to which the system removes or eliminates the health and environmental risks associated with the storage, collection, transportation and disposal of solid waste and the safety of those employees involved with the handling of solid waste. This criterion includes consideration of disease

vectors, customer and employee safety in lifting and handling refuse, and traffic safety in the collection and transportation of wastes.

- Implement ability. Measures the ease or difficulty that may be associated with putting the solid waste system into practice. This criterion includes
  political and legal obstacles that may be imposed, the financial problems that may be associated with the system. In addition, this criteria should reflect the compatibility of the proposed system with the existing system.

- Customer Service. Measures the amount of service the solid waste system provides beyond the minimum required to remove refuse. The criterion includes the amount of effort required by citizens, the collection frequency, the collection point (curb, yard, etc.), and the dependability of the system.

- Quality of the Environment. Measures the degree to which the system reduces the pollution problems associated with refuse storage, collection, processing, and disposal. Includes all factors that may affect air, water, and land pollution.

As the system is implemented, the BCSWMPC will revisit these criteria to determine how effectively each one is met. Public surveys and other forms of public input will be used to determine how effective the community perceives the criteria being met. Over time, the BCSWMPC may wish to develop a matrix scoring system to evaluate the systems using the criteria as a guide.

8. Public Education and Information

8.1 Introduction

This section outlines how Barton County plans to increase public awareness, participation, and education of existing and proposed waste diversion programs. Education and public informational activities should be designed to increase awareness about solid waste management issues and encourage changes in behavior. Awareness in the community should increase support and involvement in diversions programs. In undertaking these activities, Barton County hopes to

expand awareness not only in the residential sectors but also in the institutional, commercial, and industrial (ICI) sectors. Barton County hopes to establish emphasis on the importance of cost-effective management through source reduction, reuse, and recycling (3R's). Several activities proposed in this section include but are not limited to; continued support and enhancement of current recycling education for the residential sector; and encouragement of waste separation; and design and implementing source reduction education through advertisement, public service announcements, brochures, and press releases.

8.2 Present Efforts

Effective public outreach and communications are vital to the successful implementation of the waste reduction program. The following sections summarizes public education and information activities, programs and projects that have been or are currently conducted in Barton County.

8.2.1 Communication Objectives

An important aspect of solid waste management is for the people to understand why this management program is necessary. Public education and outreach efforts have included; information on how to use the landfill recycling sites and other recycling programs established in the area and importance of environmental issues. As discussed in earlier sections the landfill offers metal recycling, waste tire recycling, and mattress recycling. The cities of Great Bend, Hoisington, Claflin, and Ellinwood currently support permanent recycling programs. Sunflower Recycling Center provides an annual Shredding Day in Ellinwood and Larned as a professional courtesy and an opportunity to educate the public of the importance of recycling. Barton County distributes brochures listing the location and materials accepted at all recycling locations.

8.2.2 Target Audiences

The effort toward the public education and outreach objectives needs to be directed to specific target audiences. Key target groups

include schools, town, and rural residents, industrial/commercial/institutional (ICI) generators, special interest groups and residents of counties contracting with Barton County.

8.2.3 Communications Implementation

Communication activities are directed by the Barton County Solid Waste Director and the support staff. The major areas addressed include:

- Signage. Signs at recycling and waste management sites are simple, clear instructions and standardized.
- Media. Local media is utilized for public service announcements as needed for special events such as city cleanup programs, school recycling contests, waste tire drives, and HHW collections.
- Brochures. Publications are available at several key locations throughout the county. Subject matter includes HHW, recycling, and other environmental concerns.

8.3. New Public Education and Communication Programs

The possibilities for new public education and communication seem incessant. The following is a representative list of suggestions. This list is not all-inclusive and other programs should be added as the need arises.

- Printed Materials. The County can expand current brochures available to include announcements, fact sheets, mass mailings and flyers to include the following types of information: home waste reduction, types of recyclables, recycling locations, HHW education, current/changing regulations and "how to" publications. The County could also implement a new logo campaign. A contest could be held to generate ideas. The winning logo could be distributed by printing on bumper stickers, door-hangers, and advertisement.

- Slide and Video Presentations. Schools and special interests groups are ideal targets for slide and video presentations. Subject matter can include the 3R's, HHW education and environmental concerns to describing goals and intentions of the SWMP. Video could be

purchased or produced locally with the cooperation of a local television station or the community college.

- On-site Technical Assistance and Workshops. Staff from Barton County Solid Waste Department could provide community presentations at local community centers. Workshops could include composting, recycling, source reduction techniques and HHW education.

The staff would also be available on request from small businesses for on-site assistance and advising ICI groups for waste reduction ideas. Public hearings could be held to address public questions and solicit input.

8.4. Evaluation and Monitoring

It is recommended that Barton County implement an evaluation and monitoring system. The following methods could be used to monitor effectiveness of the public education efforts.

Reliable recordkeeping will be the key component in measuring how information is reaching the public. Request for material, speakers, workshops, etc. must be documented to monitor interest in the various subjects. Participants should be asked to complete a short evaluation of the service provided. Included in the questionnaire should be the appropriateness and quality of the materials presented, relevance and general responsiveness of the participant. Periodical surveys targeting residents to assess awareness, participation in and availability of public education material and programs. Criteria for evaluation efforts should include; participation rate, level of public satisfaction, waste reduction effectiveness and flexibility of program components. Efforts should be made to develop a progress report that summarizes the data gathered from the evaluation and monitoring system. The information could be presented to county commissioners, BCSWMPC and published in local newspapers.

9. COST OF RECOMMENDED SYSTEM

9.1. Administrative Requirements

The Barton County Solid Waste Director will coordinate the County's solid waste efforts, with supporting functions being provided by various County departments and agencies.

9.2 Costs

9.2.1. Capital

To implement the complete solid waste program recommended in Chapter 7, minimal acquisition of new capital facilities and equipment will be required. Table 9 – 1 describes the total capital cost for each program. A description of the equipment requirements is in Section 9.5.

9.2.2. Operations

The annual projected operating expenses for conducting each of the programs recommended in Section 7 are described in Table 9 – 2. These costs include personnel, supplies, maintenance, and other routine costs expected during the operations of these programs. The administrative costs for each of these programs is described separately in Section 9.2.4.

9.2.3. Monitoring

The operation of many solid waste facilities and programs, specifically the sanitary landfill, will require monitoring to ensure that all necessary standards are met. For example, the new Subtitle D cell will have to routinely monitor its groundwater, storm water run-off, and landfill gas migration. For the purpose of this plan, the costs for monitoring have not been broken out of the operations and administrative budgets, since they are considered a routine part of solid waste management system operations.

Table 9 – 1

Capital Cost Summary

PROGRAM	CAPITAL COST
Storage Systems	$0
Collection and Transportation	$0
Household Hazardous Waste	$2,500
Processing, Recycling, Reuse, Disposal	$2,500
Source Reduction/Education	$1,000

TOTAL CAPITAL COSTS	**$6,000**

Table 9 – 2

Operations Cost Summary

(New Costs Only)

PROGRAM	**ANNUAL OPERATION COST**
Storage Systems	$0
Collection and Transportation	$0
Household Hazardous Waste	$15,000
TOTAL ANNUAL OPERATIONS COSTS	**$15,000**

9.2.4. Administration

A key component to the implementation of any program is an efficient and effective administrative system. The elements of the administrative system were highlighted in Section 9.1. Table 9 – 3 allocated the administrative cost to implement each of the recommended programs. Additionally, not all these costs will be directly attributed to the county solid waste budget, as staff persons from various departments may be helping with a solid waste program but charging their time to their department budgets or to the county's general fund.

Table 9 – 3

Administrative Cost Summary

(Incremental New Costs)

PROGRAM	**ANNUAL ADMINISTRATIVE COST**
Storage Systems	$0
Collection and Transportation	$0
Household Hazardous Waste	$2,000
Processing, Recycling, Reuse, and Disposal	$0
Waste Diversion Programs	$11,400
TOTAL ANNUAL ADMINISTRATIVE COSTS	**$13,400**

9.2.5. Closure

The funds for the closure and post-closure of the landfill will be budgeted in the annual county solid waste budget.

9.2.6. Public Education and Information

The public education plan detailed in Section 8 assumes the use of existing programs to provide much of the necessary public education. Additionally, the solid waste manager will coordinate many of the new educational and informational programs. Therefore, the costs for these programs are included in the administrative costs detailed in Section 9.2.4.

9.3. Human Resources Requirement

To implement the recommended solid waste management system, it will be necessary that county staff be permanently assigned to the solid waste program as is now the case. Below is a listing of personnel that are expected to be required for implementation of the Plan by the Department of Environmental Health and Solid Waste.

1 – Solid Waste Director

2 – Scale Operators

5 – Equipment Operators

This list of personnel does not include any of the staffing required at the municipal level to implement the individual solid waste management programs, nor does it include any labor input from private companies or volunteer organizations.

9.4. Land Requirements

No new land will be required to implement the selected program options.

9.4.1. Subtitle D Cell Improvements

The new Subtitle D cell will be constructed at the existing county landfill and the county will continue to use existing landfill property for any future

lateral landfill expansions. Therefore, it is assumed that there will be no new additional land acquisition costs for future landfill expansions.

9.5. Equipment Requirements

To maintain the various recommended solid waste programs, existing equipment will be upgraded. The following table summarizes the required major equipment items for each program and estimated costs.

Table 9 – 4

Equipment Requirements

SUBTITLE D CELL	COST
Misc. Monitoring Equipment	$0
Misc. Equipment Upgrades	$80,000
EQUIPMENT COSTS	**$80,000**

10. SYSTEM FINANCING

10.1. Capital Improvement Budget

Based upon the recommended program components, no additional capital improvement budget is required beyond that already committed to by the county in its operating budget.

10.2. Operating Budget

The operating budget has been prepared to indicate the major expenditures expected to result from the specifics of the implementation of the selected program elements. This operating budget includes both county expenses from the solid waste program as well as limited expenses from the municipalities. The budget is only a planning budget and should not be used for actual determination of appropriations, as it is based on the estimated costs contained throughout the plan. As the plan is

implemented, the appropriate manager will have to determine a more precise based on actual labor, equipment, land, construction, and other costs as well as the cost of money for financing instruments such as loans and bonds. The appropriate manager will also have to include public education costs in the operating budget.

10.3. Financing Mechanism

Several mechanisms are available to the county for funding both the capital and operational costs associated with the solid waste system. Among the financial alternatives available for capital costs are:

- General Obligation Bonds
- Revenue Bonds
- Tax exempt municipal lease
- Leaseback
- Lease purchase bonds
- Tax increment financing
- Tax and revenue anticipation notes or warrants
- Tax exempt commercial paper
- Private financing

For the operating costs, several alternatives are also available.

- User fees
- Volume-based fees
- Uniform fees
- Property tax
- Sales tax
- Municipal utility tax
- Special tax levies

The county is currently funding its solid waste programs through a user fee system. This system ensures that the costs are allocated throughout the entire population base of the county that uses the solid waste system, with people who use the system pay for a larger portion of what they use. It has been found that user fees are a strong incentive to encourage waste reduction. However, they can also have the adverse impact of increasing illegal dumping.

It is recommended that user fees continue to be the means of funding capital and operating costs, since it assigns the costs directly to the waste generators.

11. SOLID WASTE VOLUME REDUCTION PLAN

11.1. Objective

The reduction of the quantity and toxicity of the solid waste in Barton County is one of the elements of this solid waste management plan. A solid waste diversion goal of 20 percent by the year 2030 is a reasonably attainable goal. This means that the efforts of the county will focus on reducing by 20 percent the amount of solid waste which is disposed of through a combination of measures, including source reduction, recycling, composting and special waste programs. These programs collectively are referred to as waste diversion.

11.2. Program Development

11.2.1. Source Reduction

The source reduction program will need to provide motivation for changes in manufacturing and packaging, as well as consumption and disposal habits. To be comprehensive and effective, the county can utilize a combination of the following program elements: public education and information, procurement, financial incentives, and regulations. The source reduction and reuse elements will be discussed as they relate to each generator type such as consumers, local governments, schools, businesses, and industry. The county will work with city governments to implement the source reduction and reuse plan.

Public Education and Outreach

The county's comprehensive public education and outreach program will target consumers, businesses, and schools. Each of these groups merit specific attention due to their unique characteristics. The public education and outreach program will be targeted to addressing the needs and interests of various groups and subgroups to be more successful. The county can minimize the potential generation of additional waste in its waste reduction education program by encouraging residents to save, reuse and recycle the printed information they receive. The county should develop and distribute materials in a way that reflects the principles of waste reduction and recycling. The public education program for waste reduction will focus on changing the values and behavior patterns of individuals and organizations. Some values that will be considered include environmental protection and pollution prevention; cost effectiveness; and energy and resource conservation. Several types of public education and information programs have proven to be effective with consumers. Among these are the "environmental

shopper" or "buy recycled" campaigns. Barton County could promote this type of program by sponsoring a contest for a new campaign slogan or logo. This type of programs provides consumers with suggestions or tangible examples in support of waste reduction goals. An "environmental shopper" campaign might include a booklet containing the following advice for consumers:

- Purchase items in reusable, recyclable or minimal packaging
- Avoid purchasing single use or disposable items
- Avoid waste – buy only the amount of produce you need
- Write or call manufactures to encourage them to shift toward environmental production and packaging
- Ask the following questions while shopping: Is the item durable, reusable, recyclable, biodegradable? Is the item over-packaged? Does the item contain recycled materials?

Waste reduction themes may be conveyed by using various media outlets. Several examples include public service announcements, buttons, posters and handouts. The campaign should concentrate on avoiding over-packaging, disposable products, repairing broken items, purchase durable reusable goods and purchase in bulk when justified.

Support of Reuse Activities

Reuse activities, such as donating used clothing / items, repairing broken items, and buying used items may also be targeted as part of the public education program through the following actions:

- Provide lists of non-profit organizations accepting donation items
- Provide lists of consignment shops, swap meets and rummage sales
- Provide lists of businesses / individuals providing repair or refurbishing services

Businesses may be encouraged to develop reuse programs in which retail stores give discounts to customers for utilizing reusable containers or commercial suppliers using returnable shipping containers or pallets.

Local Government Programs

Government departments may be encouraged to continue recycling and waste reduction to provide leadership in the community. Other activities to encourage include: using recycled materials, using electronic media, minimize photocopies and double-sided copies. They should also be encouraged to set policies and procurement specifications for equipment, vehicles, supplies, furniture, parts, and materials to ensure

systematically and visibly buying durable, reusable, recycled and recyclable products.

Promotion for Business and Industry

Companies may be encouraged to adopt waste reduction as an explicit goal. Voluntary corporate waste reduction initiatives will be promoted in several ways, including informing businesses of the community's waste reduction campaign, providing technical assistance, and helping to publicize waste reduction efforts and accomplishments by businesses.

To the extent resources are available, the county may assist businesses by conducting waste reduction audits. This service will only be made available, for instance, to those companies or organizations that agree to submit detailed information on waste reduction and recycling programs to the county on a regular basis. The county may try to use local institutions of higher education to provide this service.

Industrial Waste Exchanges

The county may encourage local industries to participate in industrial waste exchanges. Regional industrial waste exchanges are gaining in popularity among manufactures throughout much of the country. Industrial waste exchanges are link manufacturers that have unusable industrial by-products with manufacturers who can utilize those by-products. These materials include inorganic and organic chemicals, oils and waxes, textiles, wood, and metals. Several of these materials are hazardous or bulky; preventing or delaying their final disposition reduces potential environmental hazards and the generation of solid waste. The county may also encourage local industries to reuse equipment and other materials aside from those typically covered by industrial waste exchanges.

Some exchanges publish a newsletter or catalog to assist industries in the exchange of industrial wastes. The system resembles a highly specialized classified advertisement service, in which suppliers and recipients can place and scan listings for materials available and in demand.

Legislation

The county has statutory authority to perform activities such as passing resolutions and adopting policies to promote waste reduction by residents, as in the following examples:

- The county may pass a resolution endorsing restricted access to solid waste disposal facilities for certain types of materials in an effort promote
  reduced use, reuse, substitution with recyclable products and recycling. While primarily used to stimulate recycling, such bans could also play a part in promoting waste reduction.

- The county may adopt a policy encouraging local governments to limit by ordinance the number of containers or bags (up to a certain size) that generators may place at the curb. A county policy of this type might help to encourage waste reduction.

- The county may work with other regional and state organizations and governments to lobby for and coordinate greater product regulations, which could include mandated waste reduction in products or packaging, product initiation fees, product bans and others.

The county may consider policy-making steps to promote waste reduction by businesses and institutions including the following examples:

- Through policymaking, the county may encourage the restriction of the use of disposable, non-recyclable products or packaging in government sponsored activities.

- The county may work with other regional and state organizations and governments to support efforts to regulate certain aspects of product manufacturing and packaging.

- The county may support efforts to restrict access to solid waste disposal facilities for certain types of materials, such as HHW, in an effort to promote reuse and reduced generation of waste.

- The county may encourage modification of local zoning and permitting requirements to encourage physical and site layout changes that will result in greater waste reduction.

State and National Activities

Economic incentives or disincentives to promote waste reduction within the commercial sector usually are more effective if initiated at the state or national levels than the local level. The county may to the extent resources allow, initiate, or support economic incentives or disincentives to promote commercial section waste reduction at the state or national level. These measures may include subsidies, rebates, tax credits, advanced disposal fees, taxes on virgin materials, elimination of economic incentives for use of virgin materials and waste generation quotas.

Program Elements

Effective waste reduction and reuse programs rely on a combination of public education and information, economic incentives, and regulations. Waste reduction efforts in the county may, as indicated in the previous section, consist of several multifaceted approaches. Noticeable changes will result from the myriad of small actions to be taken by producers, distributors, consumers, and government instead of a single, major program. The following waste reduction programs and policies chosen have several benefits for the overall solid waste system:

- Synergy with recycling, composting and Household Hazardous Waste programs
- Relative ease of implementation
- Relative low cost of implementation
- Community acceptance
- Reduced strain on solid waste facility capacity
- Reduced collection and off-site handling of materials, resulting in lower system costs

The implementation of this program does not require the construction of new public facilities. New private and expanding existing facilities may include additional drop-off donation bins, repair shops and space for swap meets and other material exchanges. Some reduction will occur at the source and result in a lower quantity of materials needing off-site handling by the disposal system or the reuse and recycling network. Aspects of this program will be updated and improved as data is collected and analyzed and waste reduction and reuse strategies are further defined and improved.

By implementing the waste reduction and reuse programs described below, the county will endeavor to achieve a goal of three to five percent reduction in the quantity of waste generated. These programs were

selected because they may help to reduce the weight, volume, and toxicity of materials in the waste stream, increase recyclability of materials and extend the life of materials. To the extent that county resources are available, the following programs may be implemented:

- Develop and distribute waste reduction education materials
- Develop a campaign to encourage the public to make environmentally sound purchasing decisions and donate used material for reuse
- Work with schools to integrate expanded waste reduction and reuse, recycling and composting topics into existing school curricula and activities
- Work with local community groups to support reuse programs in several ways, including the following actions:
    - Helping nonprofit organizations to locate material drop-off donation sites
    - Publicly endorsing donation programs that assist in meeting basic human needs
    - Sponsoring periodic swap meets
    - Assembling a directory of local shops that purchase or sell used items.
    - Providing assistance in developing appliance repair programs at local technical or trade schools, sheltered workshops, senior citizen organizations and similar institutions.
    - Providing assistance to nonprofit organizations primarily involved in enabling materials reuse

- Analyze the feasibility of implementing a volume or weight-based user fee system for garbage collection
- Develop and publicize model policies to encourage waste reduction and reuse in local government offices
- Encourage modifying procurement practices of consumers, businesses, institutions, schools and local governments to promote the purchase of durable, reusable, recycled and recyclable products with a minimum of packaging.

11.2.2. Recycling

The Sunflower Recycling Program will continue to be a voluntary program. The public can drop-off recyclables at the location in Great Bend and commercial/industrial businesses are provided with on-site collection services for fiber materials. Sunflower Recycling is currently being expanded with recent improvements including facilities and

equipment upgrades, marketing practices for cost effectiveness and development of a public education center.

In 2013, the Barton County Commission established a community recycling grant funded annually through the Solid Waste Fund. Those eligible to apply for the grant include any Barton County department, agency, organization, recycling center, city, school district or community college located in Barton County, Kansas. Grant funds can be used for the following allowable costs:

- Purchase and/or repair of equipment used to recycle materials.
- Produce, print, and distribute awareness materials.
- Site improvements directly related to program/project.
- Purchase tools and supplies necessary to implement a recycling program/project.
- Material disposal fee.
- Establish new projects that would expand the types of recyclable materials accepted by local recycling businesses or expand uses for recycled materials already being collected.
- Support advertising or community education projects that promote recycling efforts.

The current funding amount for the community recycling grant is $15,000.00.

11.2.3. Composting

As discussed in the recommendations, a composting facility will not be built at the Barton County Landfill at this time. Several communities in Barton County will continue to operate burn sites and yard waste sites. The cities of Hoisington, Great Bend and Ellinwood have currently developed composting sites. Backyard composting has been encouraged throughout the County by implementation of a yard waste ban. Backyard composting is the process of managing decomposition of organic material on the generator's premises. This results in the creation of a usable soil amendment. Residential yard waste can be successfully composted by households easily with minimal negative environmental effects. This approach works well, provided that the process is properly managed. Composting kits and other retail products assisting in starting a home composting program are easily available at many retail stores. The Barton County Extension and other sources have "how-to" handouts available at no charge on starting a composting unit.

12. Implementation Schedule

A key consideration in the development of this Solid Waste Management Plan is the order and priority for implementation of various system components. Limited resources, both personnel and financial, were considered in the development of the schedule. Barton County plans financing of the various source reduction programs with K.D.H.E. and other grant programs. A timeline figure was developed to show a timeline progression for implementation of the major components of the Solid Waste Management Plan.

2022
Annual review SWMP

2023
Annual review SWMP

2024
Annual review SWMP

2025
Annual review SWMP

2026
5-year review SWMP

2027
Annual review SWMP

2028
Annual review SWMP

2029
Annual review SWMP

2030
Annual review SWMP

2031
5-year review SWMP

RESOLUTION 2000-23

A RESOLUTION BANNING YARD WASTE AT THE
BARTON COUNTY MUNICIPAL SOLID WASTE LANDFILL

WHEREAS, the Barton County Solid Waste Management Plan provides for the segregation of yard waste from municipal waste; and

WHEREAS, on September 7, 2000, the Barton County Solid Waste Management Committee approved a recommendation to the Board of County Commissioners of Barton County, Kansas, that there be a ban of yard waste at the Barton County Municipal Solid Waste Landfill.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Barton County, Kansas, based on the recommendation of the Barton County Solid Waste Management Committee, that:

1. As of January 1, 2001, yard waste will no longer be disposed of in the Barton County Municipal Solid Waste Landfill; and

2. That yard waste shall mean grass, leaves, decorative rocks, dirt and Christmas trees. Additionally, for the purpose of composting, yard waste may also include grass and leaves in combination with chipped trees and branches and other organic material collected as a result of the care of ornamental plants, lawns, shrubbery, vines and gardens; and

3. That citizens are encouraged to dispose of yard waste at composting sites operated throughout the County and that these sites are generally operated free of charge to the citizens of the cites; and

4. That the ban of yard waste is in compliance with the Barton County Solid Waste Management Plan; and

FURTHER, that the Secretary of the Barton County Solid Waste Management Committee is hereby directed to make such revisions in the Barton County Solid Waste Management Plan and to establish a manner for tracking this and future revisions to said Barton County Solid Waste Management Plan; and

FURTHER, that the Board of County Commissioners and the Barton County Solid Waste Management Committee will continue to seek alternative methods of disposal of recyclable materials in an effort to extend the life of the Barton County Municipal Solid Waste Landfill.

MOTION MADE, SECONDED AND ADOPTED this 2nd day of October, 2000.

BOARD OF COUNTY COMMISSIONERS

Patty Linsner, Chairman

Pat Keenan, Commissioner

Kirby Krier, Commissioner

ATTEST:

Donna Zimmerman, County Clerk

BARTON COUNTY KANSAS SEAL COUNTY CLERK

APPROVED AS TO FORM:

Richard A. Boeckman, County Counselor