SCS ENGINEERS

Heart of Texas Council of Governments
Volume II
Regional Solid Waste Management Plan
2013 Update

Presented to:

HEART OF TEXAS COUNCIL OF GOVERNMENTS
1514 South New Road
Waco, Texas 76711

Prepared by:

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November 2013
File No. 16213039.00

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ADOPTION RESOLUTIONS

To be inserted once SWMP is adopted by HOTCOG SWAC and Executive Board

ACKNOWLEDGEMENTS

Development of this update to the Regional Solid Waste Management Plan for the Heart of Texas was made possible thanks to the valuable support and contributions from the organizations, entities, and individuals recognized below:

- Heart of Texas Council of Governments (HOTCOG)
    - 2013 HOTCOG Executive Officers and Executive Committee
    - Solid Waste Advisory Committee (SWAC) (see Appendix A)
    - Kathy Trimmer , Regional Services Manager
    - Falen Bohannon, Environmental and Air Quality Planner
- Texas Commission on Environmental Quality (TCEQ)
    - Cheryl Untermeyer
- SCS Engineers (SCS)
    - Kevin D. Yard, P.E., BCEE
    - Marc J. Rogoff, Ph.D.
    - Jeffrey Arrington, P.E.

Acronyms and Abbreviations

CCS	Citizens' collection station
C&D	Construction and demolition debris
CHP	Combined heat and power
COG	Council of Government
CTRA	Cooperative Teamwork and Recycling Assistance
FY	Fiscal year
HHW	Household hazardous waste
HOTCOG	Heart of Texas Council of Governments
MSW	Municipal solid waste
NSPS	New source performance standards
RCRA	Resource Conservation and Recovery Act
RFQ	Request for qualifications
SCS	SCS Engineers
SWAC	Solid Waste Advisory Committee
SWMP	Solid Waste Management Plan
TCEQ	Texas Commission on Environmental Quality
TIDRC	Texas Illegal Dumping Resource Center
U.S. Census	United States Bureau of the Census
U.S. EPA or EPA	United States Environmental Protection Agency
WMARSS	Waco Metropolitan Area Regional Sewerage System

1 EXECUTIVE SUMMARY

1.1 POPULATION AND GROWTH PATTERNS

HOTCOG has over 80 member governments made up of: counties, cities, school districts, community colleges, and special districts. Originally established in 1966, HOTCOG serves a geographic area encompassing 5,611 square miles covering Bosque, Falls, Freestone, Hill, Limestone and McLennan counties.

According to the 2000 and 2010 U.S. Census, the population of the HOTCOG region has grown from 323,536 to 351,283 (an 8.6 percent increase in 10 years). The 2000 to 2010 period was a time of expansive growth in the Texas economy and population. However, a general slowdown of the U.S. and the Texas economies occurred in the later part of the 2000 to 2010 decade due to impacts of the Great Recession. This resulted in a slight decline in the future population projections (2000 and beyond) included in the original 1992 and updated Plans.

Recent data collected by the Texas Data Center and the Office of the State Demographer suggest that the Texas economy and population are again showing substantial growth. Nonetheless, these two organizations have recommended using the "0.5 Scenario" for planning purposes because it is unlikely, in their opinion, that such recent trends will continue at the level of the 2000-2010 period for the next 40 years. The "0.5 Scenario" assumes continued growth, but at reduced levels for the region, ranging from 5 to 7 percent per decade. Based on this population growth estimate, HOTCOG is projected to have a population of 446,000 people for the year 2050.

1.2 ECONOMIC ACTIVITY

The HOTCOG region is heavily agricultural, with a strong industrial and commercial center in the Waco MSA, and smaller industrial and commercial centers in Hillsboro and Mexia. Access to health centers is generally good throughout the region, with two major health centers in McLennan County and rural health centers in each of the other counties.

The HOTCOG region has experienced a great amount of positive economic activity during the last 20-year planning period. A significant number of new employers have either relocated into the region or expanded their staff. Economically, the region is generally stable; the unemployment rate is slightly lower than the State average, as are wages. Nonetheless, there is still room for improvements in business development and economic growth for the region. There is a ready workforce with relatively low overall skill level, but robust workforce training providers who can quickly deliver specialized training. There is a need for jobs in the rural counties and a need for jobs, particularly mid-skill level jobs, in McLennan County.

The Heart of Texas Economic Development District has a five-fold strategy for regional economic development:

- Increase innovation and entrepreneurship
- Brand and market the region

- Increase business' access to capital
- Increase economic development readiness among local jurisdictions
- Foster key economic develop catalyst projects

These initiatives are targeted to increase the fertility of the region's economic development environment, so that new businesses are more likely to take root; existing businesses are more likely to expand and multiply; and transplant businesses are more likely to locate and proper here.

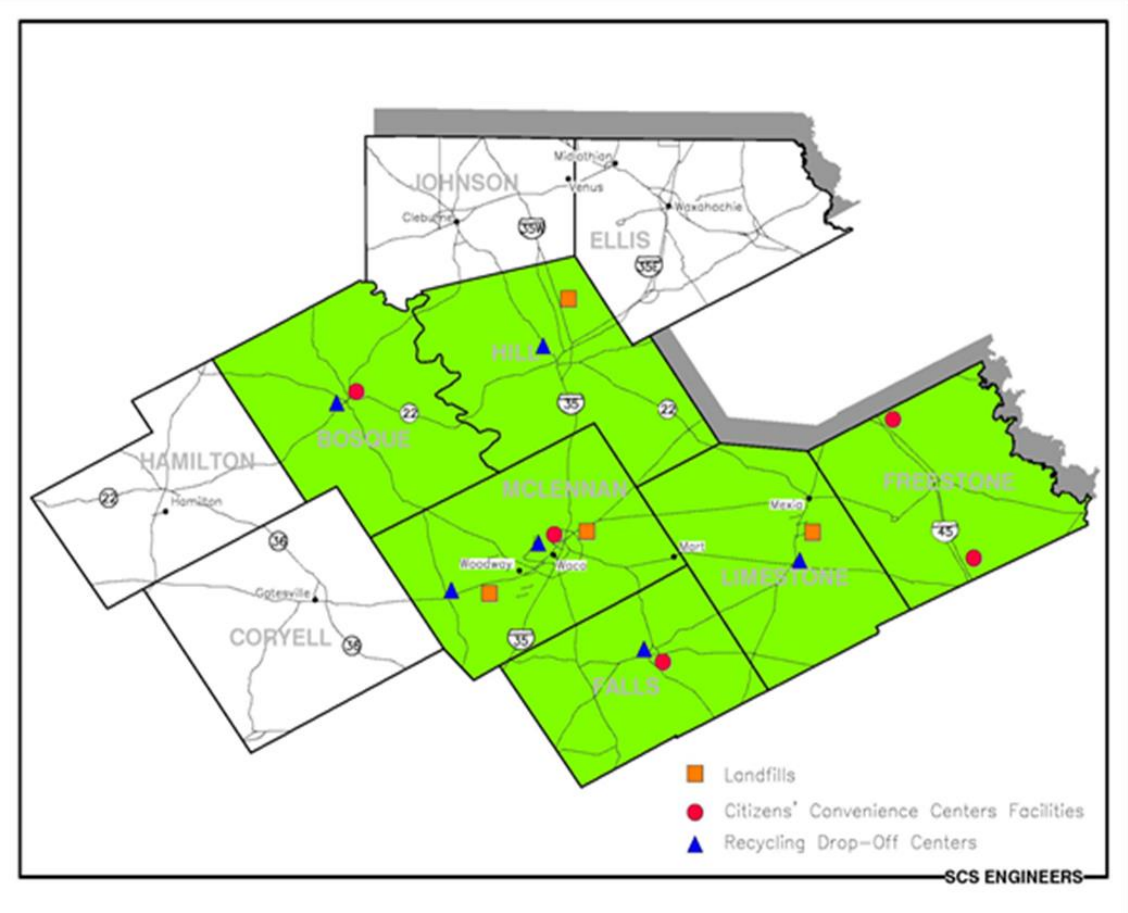
1.3 WASTE GENERATION

Municipal solid waste streams disposed of at permitted landfills in the region derive from residential, commercial and institutional, municipal biosolids, industrial, mining, and agricultural sources. Since the preparation of the 1992 Regional Solid Waste Plan, the HOTCOG region has experienced an estimated 33 percent increase in annual municipal solid waste requiring disposal. Current estimates of waste generation indicate that residents in HOTCOG are generating an average of 6.7pounds of municipal solid waste per person per day requiring disposal. It is estimated that the region will generate a little more than 456,000 tons of municipal solid waste in 2020 and over 500,000 tons of waste in 2040. To minimize use of the region's valuable landfill resources, this suggests an opportunity for residents and businesses in the region to reduce and recycle.

1.4 WASTE MANAGEMENT SYSTEM

Exhibit 1-1 illustrates the locations of landfills, citizens' collection station facilities, and recycling drop-off centers. In addition, these facilities, as well as closed landfills, are shown on the county maps in Appendix D.

Exhibit 1-1 HOTCOG Region – Solid Waste Facilities



1.4.1 Collection Programs

Municipal solid waste is either collected in the region by private haulers, public agencies, or dropped off by residents at rural collection stations. The 2013 Solid Waste Survey, which was conducted for the SWMP update suggests that, in many areas of the region, multiple waste haulers oftentimes collect in the same general vicinity. While this affords residents a variety of waste collection choices, it does reduce potential economies of scale for collection, and potentially drives up waste collection prices. The six-county HOTCOG region has a limited number of citizens' collection stations that will accept some types of solid waste and recyclables. These six citizens' collection stations have been established in several municipalities as well as county governments within the region. These stations typically consist of open top containers that are set up at a convenient location for citizens to access, and are operated by a municipality or county in cooperation with private haulers. Based on discussions with county environmental officers, these facilities are heavily used by residents and those with lower fees are used much more frequently than the other facilities that charge more to dump loads. There are currently no collection stations that serve unincorporated areas in McLennan County, Hill County, Limestone County or Bosque County outside of the City of Meridian.

The largest public collection program in the region is operated by the City of Waco Solid Waste Services Department. Briefly, residents with residential service must use a wheeled 95, 65 or 35-

gallon container for disposing of household trash. As indicated on the City's website, blue (recycling) and green (yard waste) carts will be collected every other week, on alternating weeks. The blue and green carts will continue to be put out on the same days as the trash.

1.4.2 Transport

Based on a review of TCEQ's Annual Report and the results of a 2013 survey, which was undertaken for this plan update, there are no permitted transfer stations nor any facilities that are storing, treating, or processing municipal solid waste in the HOTCOG region.

1.4.3 Recycling Programs

The City of Waco's curbside recycling program started as a pilot scale program for paper and cardboard only in 2000. As interests grew, more households were added. Eventually, the program became a single-stream curbside program which includes all paper products, metals, and all plastics except Styrofoam. The current participation rate is approximately 28.5% of households that voluntarily participate in the curbside program. That program has helped to divert a lot of materials that would have otherwise gone into the landfill and taken up space there.

Participation in the City of Waco Curbside Recycling program is voluntary, not mandated. From a total of 34,559 residential accounts, the total number of participating households is 9,568 (27.7%). On an annual basis, the curbside recycling program collects approximately 3,000 tons of recyclable materials. It has been estimated that the average City of Waco household recycles approximately 520 pounds per year. By weight, the greater Waco MSA residential recycling rate has been estimated to be 16.9%. A total of 79 businesses, 7 residential apartments, 20 public elementary schools, 21 secondary public schools and 4 private schools participate in recycling. A breakdown of the weekly number of households for recyclables and yard/brush collection is presented in Exhibit 1-2 below.

Exhibit 1-2 City of Waco Curbside Recycling

Households Serviced Weekly (2012 Data) Day Week	Households Serviced – Recyclables*	Households Services - Yard/Brush	Total Customers	Average Customers Service/Day
Monday	2,330	533	2,863	550.58
Tuesday	804	194	998	191.92
Thursday	1,075	310	1,385	266.35
Friday	2,050	584	2,634	506.54
Total	6,259	1,621	7,880	378.85

Source: City of Waco, 2013

The Cobbs Recycling Center, also known as the Cobb's Citizens' Convenience Center, is an approximate 1.6 acre facility that accepts recyclable materials, brush and bulky waste from the City of Waco as well as surrounding unincorporated areas and other cities where these services are not currently available. From the time period of August 2011 to July 2012 a total of 24,242 citizens used this facility for the drop off of their recyclables, brush and bulk wastes.

The Cobb's Recycling Center accepts drop off paper (i.e. advertising circulars and junk mail paperboard packaging, cardboard boxes, newspaper magazines and catalogs, phone books, office paper and carbonless paper), glass, metals (aluminum, copper, tin and steel), and both commodity grade and engineering grade plastics with SPI Resin Codes **(**Polyethylene Terephthalate (PETE) #1, High Density Polyethylene (HDPE) #2, Polyvinyl Chloride (PVC) #3, Low Density Polyethylene (LDPE) #4, Polypropylene (PP) #5, Polystyrene (PS) #6 and Polycarbonate #7. The center does not accept Styrofoam.

Outside of the Waco metropolitan area, curbside recycling services are limited in the region. Some of the citizens' collection centers and private facilities in the region accept selected recyclable materials such as paper, plastic, ferrous, aluminum cans, and glass bottles. Other drop-off locations include schools, retail establishments, churches, and public buildings. Further, some of the cities host yard waste recycling programs with mulching or chipper services. However, the main limitations to recycling as a means to waste reduction are:

- Currently limited recycling infrastructure
- Including Waco, there are only four cities with a population over 10,000. This decentralized population creates challenges for cost-effective recycling.
- Availability of relatively low cost disposal at the landfills within the region

1.4.4 Disposal

As of date of this Plan update, the remaining capacity of the landfills in the HOTCOG region is approximately 56.8 million tons, of which 94 percent is controlled by the private sector and six percent by the public sector.

Texas has an abundance of landfill capacity with TCEQ's most recent report in 2011 on statewide disposal practices revealing an overall statewide capacity of 1.8 billion tons. In view of the ability for waste to flow without limitation across region boundaries in Texas, total landfill

disposal capacity does not appear to be a short-term concern, either in the HOTCOG region or in the State of Texas. As such, assessing the need for additional landfill disposal capacity over the 20-year planning period requires consideration of various other factors, including the proximity of the landfills to population centers, the interest of the public sector in maintaining control over a certain portion of the region's landfill capacity, and the cost to transport waste to these landfills.

1.4.5 Household Hazardous Waste

Household hazardous waste (HHW) is managed within the region through periodic collection events. In the past several years, HOTCOG has supported one-day collection events that have included McLennan County cities of Waco, Hewitt, Lorena, Lacy Lakeview, Robinson and Woodway. Most recently, HOTCOG funding was not available for the multi-city event; the 2013 event included Waco, Hewitt, Lorena, Lacy Lakeview and Woodway.

1.5 REGIONAL PLANS

The TCEQ regulations provide guidance for local solid waste plans, as well as regional plans. There are currently no sub-regional or local solid waste management plans in place in the region. The HOTCOG plan is the only adopted plan for the region.

1.6 SUMMARY OF NEEDS AND PROBLEMS

According to the results of the *2013 Solid Waste Survey* and communications with the Solid Waste Advisory Committee (SWAC), illegal dumping and improving collection to underserved areas were issues of major concern for the HOTCOG region. In addition, there is a notable interest in increasing opportunities for recycling. Other concerns identified in the course of the study included maximizing disposal facilities and enhancing public awareness of solid waste issues in the region. Many of these issues were previously identified in the 1992 Plan and various updates and were identified as goals by the SWAC.

1.6.1 Illegal Dumping/Open Burning Not Considered a Problem By Some Residents

While most residents in the HOTCOG region continue to manage their wastes in an environmentally-responsible manner, illegal dumping continues across the region (Exhibit 1-3). There are various reasons for illegal dumping ranging from lack of convenient waste disposal locations in many rural areas to a lack of understanding that illegal dumping poses an environmental and safety threat to their neighbors. The poverty rate and related resource limitations are also believed to be contributing factors.

Exhibit 1-3 Illegal Dumping in McLennan County, Texas

Source: McLennan County Sheriff's Office

1.6.2 Residents and Businesses Are Willing to Take Risks

Some residents and businesses in the HOTCOG region may be aware that dumping of solid waste is illegal, but are willing to risk illegal dumping because they perceive their chances of being caught are still relatively small. While the State has a number of "antidumping" statutes on the books and there are effective county environmental enforcement programs in the HOTCOG region, the reality is it is still *difficult* to catch illegal dumpers.

1.6.3 Convenient Options for Waste Disposal and Recycling

While there are a number of disposal locations in the HOTCOG region, which include citizens' collection centers and landfills, there are many cases where these facilities are inconvenient to rural residents and businesses because they are located at great distances where these residents and businesses are located. It is believed that locating additional citizens' collection centers in the HOTCOG region will alleviate this problem.

1.6.4 Streamlining Collection Options

The *HOTCOG 2013 Solid Waste Survey* showed that solid waste collection services are available throughout each county in the HOTCOG region. However, as the results showed, providing these services in a cost-effective manner in unincorporated areas of the counties is difficult for many solid waste providers due to issues such as inefficient routes, multiple haulers providing services in the same areas, and unpredictable receipts of customer billings. This is a typical solid waste management problem seen in rural areas with low population densities, and oftentimes results in making curbside collection too expensive. Communities across the U.S. have addressed this problem by taking a more coordinated approach to residential collection services in their unincorporated areas, either through standardized collection agreements, franchising, or mandatory collection.

1.6.5 Expanded Public Information/Education on Solid Waste Management

The City of Waco has extensive information regarding the City's multi-faceted solid waste management program available on its website. Furthermore, the City has an outreach program to enhance communications with residents and businesses. However, based on the results of the *2013 Solid Waste Survey*, in many of the communities, particularly in the unincorporated areas of the counties, it appears that while many residents and businesses may have access to collection, disposal, and recycling services, public information (web sites, community fact sheets or flyers, etc.) on these services appears not to be readily available. This suggests that many municipalities and counties may need to improve communications regarding the locations of these facilities or centers as well as access to collection with private waste haulers in the region.

1.7 REGIONAL GOALS AND OBJECTIVES

As approved by the TCEQ in 2007, the overall goals of the RSWMP are as follows:

Goal 1: Promote integrated solid waste management strategies as described in the Waste Management Hierarchy, which are appropriate for the HOTCOG region under state and federal priorities, which assure long-term disposal capacity.

Goal 2: Encourage public education and involvement in integrated solid waste management.

Goal 3: Encourage and promote funding availability to ensure regional and local implementation of this plan.

Goal 4: Encourage the development of household hazardous waste management and diversion programs.

Based on the results of the *HOTCOG 2013 Solid Waste Survey*, and the major needs and problems discussed in the paragraphs above, HOTCOG staff and the consulting team worked with the HOTCOG Solid Waste Advisory Committee (SWAC) to review these goals and the related objectives in the previous RSWMP and to assess the priorities of the various objectives and to develop implementation strategies that reflect current conditions for the next 20-year planning period. The consulting team then worked with the SWAC to categorize these goals and related objectives into the three planning timeframes (a short-term five–year planning horizon, 2013 -2017; an intermediate five-year planning horizon, 2018-2022; and a long-range 10-year planning period, 2023-2032) for accomplishing or implementing these goals. Exhibit 1-4 graphically presents a summary of the regional goals, objectives, and action plan of the RSWMP.

Exhibit 1-4 Plan Goals and Objectives Related to the Planning Horizon

GOALS	OBJECTIVES Short Term (1-5 Years)	Intermediate Term (6-10 Years)	Long-Term (11-20 Years)
1: Promote Integrated Solid Waste Management Strategies	Expand residential collection services to currently underserved areas Improve service to underserved areas through construction of new strategically located citizens' collection stations. Maximize capacity and efficiency of recycling operations Maximize capacity and efficiency of landfills	Continue to address underserved areas as warranted by needs and population growth of the HOTCOG region, e.g., expand citizens' collection stations, as needed Address recycling needs in response to changes in market dynamics of recycled commodities Address capacity issues, as warranted by current capacity of integrated waste management system (e.g., expand landfill(s)) Continue to monitor the development of waste-to-energy and waste conversion technologies and implement, when feasible	Encourage the development of transfer stations, as needed to address efficiencies of transporting MSW to disposal/processing facilities Continue to monitor the development of waste-to-energy and waste conversion technologies and implement when feasible
2: Encourage Public Education and involvement in integrated solid waste management	Develop public education materials about solid waste management and recycling Increase public awareness of the importance of stopping illegal dumping Increase public awareness through clean-up events such as Waste Tire Amnesty Days Encourage community programs through school curricula, advertising campaigns, environmental programs, and volunteer organizations Encourage local efforts to stop illegal dumping Clarify local government responsibilities and encourage use of litter abatement officers with a vision of establishing a regional task force	In view of continuous evolution of the solid waste management system, continue to update the public on proper MSW management	In view of continuous evolution of the solid waste management system, continue to update the public on proper MSW management
3: Encourage and Promote Funding Availability to Ensure Regional and Local Implementation of this Plan	Utilize available grant funds for local plans, illegal dumping enforcement, and development of collection stations Provide updates and distribution of the regional solid waste information system Promote and encourage grant and loan funds from federal, state, and private sector institutions to comply with the plan	Continue to monitor the availability of grants and pursue grant funding consistent with HOTCOG's goals	Continue to monitor the availability of grants and pursue grant funding consistent with HOTCOG's goals
4: Encourage the Development of HHW and Diversion Programs	Encourage public and private partnership efforts Support reduction of HHW	Assess the need, feasibility and public interest of a regional HHW collection facility(s) or mobile facility(s) Recommend the development and use of alternative non-HHW products	

2 PLAN OVERVIEW

2.1 INTRODUCING THE PLAN

The *Heart of Texas Regional Solid Waste Management Plan* was initially developed in 1992 under the *Texas Municipal Solid Waste Management, Resource Recovery and Conservation Act*, which is currently referred to as the *Texas Health and Safety Code*. The Act required that the 24 Councils of Governments (COG) (Exhibit 2-1) develop regional solid waste management plans. The regional plan addresses the following facets of solid waste: municipal wastes, municipal sludges, and other solid wastes generated in the Heart of Texas Council of Governments (HOTCOG) region to the extent the waste has an impact upon municipal operations, systems, or facilities. The regional description, solid waste management system, program evaluation and needs assessments, presentation of alternatives, goals, objectives, priorities, regional recommendations, and an action plan are included in the Plan. The Plan was designed for the planning period between the years 1991 and 2010.

The format was based upon the State's *Content and Format Guide for Regional Solid Waste Management Plans.* Public hearings were held in Bellmead, Mexia, and Hillsboro, at which time written and verbal comments were received. All comments were considered by the Regional Solid Waste Management Planning Council, currently the Solid Waste Advisory Committee, prior to their approval. The Plan was adopted by the HOTCOG Executive Committee on August 27, 1992, and was submitted to the State for acceptance as a formal rule.

2.2 REGIONAL PLAN AMENDMENT REQUIREMENTS

The Regional Solid Waste Management Plan must be amended every four years, in accordance with the *Solid Waste Management in Texas – Strategic Plan 2001-2005* (SRF-40), to comply with the Texas Commission on Environmental Quality (TCEQ) grant contract requirements. Pursuant to this requirement, HOTCOG submitted Plan updates in 1996, 2002, and 2006 in order to coordinate with TCEQ's state plan.

The new Plan, as constituted in this report, is the first major comprehensive update since 1992, As such, the planning period is 2013 through 2033. Upon completion, HOTCOG will present the Plan to its Solid Waste Advisory Committee (SWAC) (see Appendix A). After the SWAC's acceptance, the Plan amendment will be presented to the HOTCOG Executive Committee for review and approval for submission to the TCEQ.

2.3 PLAN PLANNING PROCESS

This plan was developed for the six-county HOTCOG region. The planning units addressed specifically are the six counties including: Bosque, Falls, Freestone, Hill, Limestone, and McLennan Counties and the incorporated cities therein. The planning periods defined within the 20-year HOTCOG plan are the following:

- The Base Year, 2013.
- The Short-Range Planning Period, 2014-2018.

- The Intermediate Planning Period, 2019 to 2023.
- The Long-Range Planning Period, 2024 to 2033.

2.4 METHODOLOGY FOR UPDATING THE RSWMP

Virtually every aspect of the RSWMP was updated using various sources, as described in the individual sections of this document. Developing the database for the update involved various sources, most notably a survey which involved three principal sources of information: cities within the six county HOTCOG region, the six counties, and private waste haulers. Individual surveys were developed for each of these groups and e-mailed to responsible officials within these groups. Appendix B contains the results from this survey developed by SCS. To enhance the responsiveness from the surveyed groups, HOTCOG staff e-mailed the survey using e-mails which were tailored to the individual groups. In addition, HOTCOG staff provided valuable assistance in following up with entities that did not respond to the initial survey. Furthermore, SCS followed up with county enforcement officers to acquire additional information found under the Illegal Dumping section of the report. This survey was deployed using Survey Monkey, which enabled respondents to complete a detailed survey online, which, in turn, was summarized by SCS in Appendix B. The data in this appendix are further discussed in various sections of the RSWMP.

2.5 PUBLIC PARTICIPATION AND EDUCATION

Public participation and education during the planning process included the regular SWAC meetings, which were noticed and open to the public. A public meeting, which included the SWAC, was held on September 12, 2013 to seek further input for the goals and recommended system enhancements included in the Plan, and finalization of the overall plan.

2.6 PLAN ADOPTION BY EXECUTIVE COMMITTEE

As noted above, a public meeting, which was noticed and open to the public, was held on September 12, 2013 on the HOTCOG Plan prior to adoption by the HOTCOG Executive Committee. Comments obtained during that meeting have been incorporated into this RSWMP.

2.7 PLAN SUBMITTAL TO TCEQ

The Plan will be submitted to the TCEQ for approval and adoption consistent with 30 TAC Subchapter O, Regional and Local Solid Waste Management Planning and Financial Assistance General Provisions.

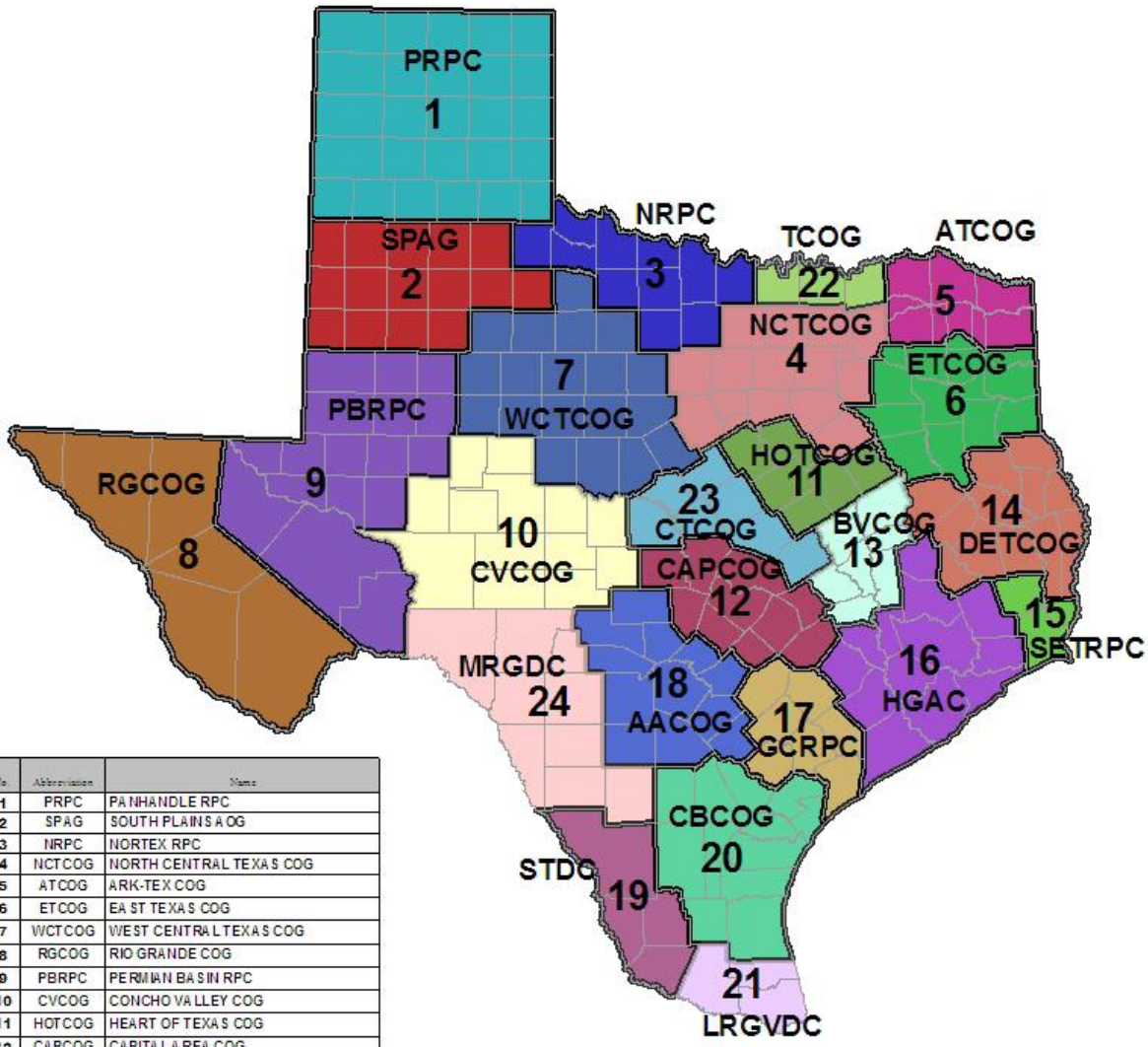
2.8 PLAN IMPLEMENTATION

The Plan will be implemented according to the procedures described in Section 4. HOTCOG and the SWAC will coordinate the aspects of the Plan implementation.

2.9 PLAN EVALUATION, UPDATING AND AMENDMENTS

The Plan will be monitored by SWAC and HOTCOG according to the procedures described in Section 3.0. It will be updated or revised after five years (2018) or sooner, if conditions warrant. Any official amendments will be submitted to the TCEQ for approval.

Exhibit 2-1 Texas Councils of Governments



No.	Abbreviation	Name
1	PRPC	PANHANDLE RPC
2	SPAG	SOUTH PLAINS AOG
3	NRPC	NORTEX RPC
4	NCTCOG	NORTH CENTRAL TEXAS COG
5	ATCOG	ARK-TEX COG
6	ETCOG	EAST TEXAS COG
7	WCTCOG	WEST CENTRAL TEXAS COG
8	RGCOG	RIO GRANDE COG
9	PBRPC	PERMIAN BASIN RPC
10	CVCOG	CONCHO VALLEY COG
11	HOTCOG	HEART OF TEXAS COG
12	CAPCOG	CAPITAL AREA COG
13	BVCOG	BRAZOS VALLEY COG
14	DETCOG	DEEP EAST TEXAS COG
15	SETRPC	SOUTH EAST TEXAS RPC
16	HGAC	HOUSTON-GALVESTON AC
17	GCRPC	GOLDEN CRESCENT RPC
18	AACOG	ALAMO AREA COG
19	STDC	SOUTH TEXAS DC
20	CBCOG	COASTAL BEND COG
21	LRGVDC	LOWER RIO GRANDE VALLEY DC
22	TCOG	TEXOMA COG
23	CTCOG	CENTRAL TEXAS COG
24	MRGDC	MIDDLE RIO GRANDE DC

Abbreviation	Name
RPC	REGIONAL PLANNING COMMISSION
AOG	ASSOCIATION OF GOVERNMENTS
COG	COUNCIL OF GOVERNMENTS
AC	AREA COUNCIL
DC	DEVELOPMENT COUNCIL

Source: TCEQ, 2012.

3 REGIONAL ANALYSIS

3.1 PHYSICAL CHARACTERISTICS

Currently, HOTCOG has over 80 member governments made up of: counties, cities, school districts, community colleges, and special districts. HOTCOG was originally established in 1966 and serves a geographic area encompassing 5,549 square miles covering Bosque, Falls, Freestone, Hill, Limestone and McLennan counties (Exhibit 3-1). The region has a population density of 62.94 residents per square mile, compared to a statewide density of 93.54.

Exhibit 3-1 Location of HOTCOG Region

Source: HOTCOG

3.2 DEMOGRAPHIC CHARACTERISTICS

The 2000 to 2010 period was a time of expansive growth in the Texas economy and population. However, a general slowdown of the U.S. and the Texas economies occurred in the later part of the 2000 to 2010 decade due to impacts of the Great Recession. This resulted in a slight decline in the future population projections (2000 and beyond) included in the original 1992 and updated Plans. Recent data collected by the Texas Data Center and the Office of the State Demographer suggest that the Texas economy and population are again showing substantial growth. Nonetheless, these two organizations have recommended using the "0.5 Scenario" for planning purposes because it is unlikely, in their opinion that such recent trends will continue at the level of the 2000-2010 period for the next 40 years. The "0.5 Scenario" assumes continued growth, but at reduced levels.

As shown in Exhibit 3-2, projections of the population of Texas and each county in the HOTCOG region using the "0.5 Scenario" have been prepared by Texas State Data Center and the Office of the State Demographer staff members. These data show the following regional population increases over the next four decades:

- 2010-2020 7.1%
- 2020-2030 7.0%
- 2030-2040 5.4%
- 2040-2050 5.1%

Exhibit 3-2 Population, HOTCOG Region

Sub Region	County	2000	2010	2020	2030	2040	2050
One	Bosque	17,204	18,212	19,273	20,192	20,574	21,019
	Hill	32,321	35,089	37,828	40,277	41,935	43,643
Two	McLennan	213,517	234,906	252,211	272,216	289,887	307,661
Three	Falls	18,576	17,866	18,665	19,077	19,052	18,851
	Freestone	17,867	19,816	20,920	21,972	22,695	23,426
	Limestone	22,051	23,384	25,136	26,615	27,817	29,134
Region		**321,536**	**349,273**	**400,349**	**402,379**	**421,960**	**443,734**

Source: U.S. Census Bureau, 2010; Texas Data Center, 2013

The Waco Metropolitan Statistical Area, as defined by the United States Census Bureau, is an area consisting of two counties – McLennan and Falls, anchored by the City of Waco. As of the April 2010 census, the MSA had a population of 234,906 (although a U.S. Census 2012 population estimate, released in June 2013, is 256,317). This includes Falls County which was added to the Waco MSA in 2013.

Exhibit 3-2 provides recent population data from the 2010 U.S. Census and population estimates for cities within the HOTCOG region, as developed by the Texas Data Center. Roughly, two-thirds of the HOTCOG region's population is located in McLennan County. The largest city in the MSA is Waco, which has an estimated population of 124,805 according to the June 2013 U.S. Census population estimate. Most of the HOTCOG region is made up of relatively small cities, which have continued to grow slowly over the last few decades. Exhibit 3-3 lists the populations of cities within the HOTCOG region. The following distribution of the populations in the smaller cities (other than Waco) can be observed from this exhibit:

Exhibit 3-3 Population HOTCOG Cities

Population Range of Cities	Number of Cities within Population Range
Greater than 15,000	
10,000 – 14,999	3
5,000 – 9,999	6
2,000 – 4,999	9*
1,000 – 1,999	13**
Less than 1,000	27

* Includes Axtell (unincorporated area)

** Includes China Springs (unincorporated area)

Cities in HOTCOG Counties

	City	Population		City	Population
McLennan	Axtell *	2,284	Hill	Abbott	356
	Bellmead	10,061		Aquilla	109
	Beverly Hills	2,026		Blum	444
	Bruceville-Eddy	1,495		Bynum	199
	China Spring *	1,281		Carl's Corner	173
	Crawford	730		Covington	269
	Gholson	1,078		Hillsboro	8,456
	Hallsburg	516		Hubbard	1,423
	Hewitt	13,767		Itasca	1,644
	Lacy-Lakeview	6,593		Malone	269
	Leroy	342		Mertens	125
	Lorena	1,717		Mount Calm	320
	Mart	2,209		Penelope	198
	McGregor	5,066		Whitney	2,087
	Moody	1,393		**Sum of Cities Pop.**	**16,072**
	Riesel	1,024		**Hill Co. Pop.**	**35,089**
	Robinson	10,509	Limestone	Coolidge	955
	Ross	288		Groesbeck	4,328
	Valley Mills	1,203		Kosse	464
	Waco	126,697		Mexia	7,459
	West	2,807		Tehuacana	283
	Woodway	8,587		Thornton	526
	Sum of Cities Pop.	**201,673**		**Sum of Cities Pop.**	**14,015**
	McLennan Co Pop.	**234,906**		**Limestone Co Pop.**	**23,384**
Bosque	Clifton	3,442	Freestone	Fairfield	2,951
	Cranfills Gap	281		Kirvin	129
	Iredell	339		Oakwood	510
	Laguna Park	1,267		Streetman	247
	Meridian	1,493		Teague	3,560
	Morgan	270		Wortham	1,073
	Walnut Springs	827		**Sum of Cities Pop.**	**8,470**
	Sum of Cities Pop.	**7,919**		**Freestone Co Pop.**	**19,816**
	Bosque Co Pop.	**18,212**			
Falls	Golinda	559		Marlin	5,967
	Lott	759		Rosebud	1,412
	Sum of Cities Pop.				**8,697**
	Falls Co Pop.				**17,866**

* Unincorporated areas

Source of Population Data: Bureau of the Census, American FactFinder

2010 Census Redistricting Data (Public Law 94-171) Summary File

Geographic Area: Texas

www.tsl.state.tx.us/ref/abouttx/popcity12010.html

3.3 ECONOMIC CHARACTERISTICS

Briefly, cities and counties in the region experienced significant economic growth during the last decade, although at a lesser growth rate due to the recent economic recession. Exhibit 3-4 shows the distribution of employment across various sectors in the economy. Exhibit 3-5 is a listing of major employers in the greater Waco area. The following paragraphs briefly summarize *County Business Pattern* reports, published by the U.S. Bureau of the Census for 2010.

On the whole, the HOTCOG region is faring relatively well in terms of employment. Unemployment has dropped over the past year; analysis of 2010 unemployment is included for purposes of comparison between counties. The 2010 regional unemployment rate was 7.5% compared to the State of Texas' rate of 8.2%. McLennan County's unemployment rate was 7.4%. Freestone and Limestone Counties had the lowest unemployment rates in 2010: 6.6% and 6.8%, respectively. Bosque and Hill Counties each had higher than the State's level, with 8.7% and 8.3%, respectively. Falls County had the highest unemployment rate in the region with 9.6%.

The region's economy is largely driven by that of the Waco MSA, which includes the whole of McLennan County. This economy is based on manufacturing, retail trade, business, government, and education. According to the U.S. Bureau of Labor Statistics, total employment consisted of 95,918 jobs as of 2011 with approximately 26% of these in education, health care, and social assistance. A vast majority of these were centered on the growth on the Baylor University campus. Waco's economy is characterized by persistent high poverty, with a median per capita income of $16,369, according to the 2010 American Community Survey, as compared to the national average of $26,059. Waco's low wages and underemployment play a large part in keeping regional incomes low as well.

Employment in Bosque County is concentrated on construction, manufacturing, retail trade, education, health care, and social assistance sectors. Total employment is 2,636 persons in 2010. The largest sector is manufacturing, which currently employs 551 persons.

In Hill County, the Outlet Shopping Mall in Hillsboro has experienced a reduction in retail trade; of the 82 stores, over 65% are currently vacant.

The Texas Department of Criminal Justice (TDCJ) is a significant employer in Falls County. According to correspondence with TDCJ, the correctional facilities in Marlin employ over 400 staff and have capacity for over 1900 inmates. Falls County also has a significant number of wholesale and retail trade establishments (60), which account for 410 jobs.

Freestone County has a total of 744 employed in the 80 establishments of the wholesale and retail industry. A significant number of dining and motels have been established along the Interstate Highway 45.

Lastly, Limestone County has seen growth in the activities at Fort Parker Historical Park, which has increased tourism to the area. Countywide, there are a total of 90 retail establishments employing 1,059 persons.

Exhibit 3-4 Industry Profile by County by Percent

Industry	Texas	Bosque	Falls	Freestone	Hill	Limestone	McLennan
Agriculture, forestry, mining	2.9	5.8	7.1	16.6	5.7	9.6	1.2
Construction	8.6	11.2	9.2	7.9	12.1	6.9	6.9
Manufacturing	9.7	12.3	11.2	5.1	11.4	5.6	12.3
Wholesale trade	3.3	2.7	2.1	2.1	2.5	2.4	3.3
Retail trade	11.5	11.1	8.6	11.1	12.4	12.1	12.8
Transportation	5.7	6.2	4.9	6.8	8.4	6.3	4.9
Information	2.2	1.1	0.3	0.3	0.7	0.9	2.3
Finance, insurance, real estate	6.9	5.0	4.8	3.2	4.5	2.7	6.5
Professional, scientific, management	10.5	4.2	3.8	6.5	4.9	5.4	6.8
Education, health care, and social assistance	20.8	26.3	25.7	26.3	20.0	31.6	26.0
Arts, entertainment, food services	8.2	4.9	6.1	4.1	7.5	3.4	8.3
Other services	5.2	4.7	5.4	4.8	5.4	5.0	4.8
Public Administration	4.4	4.4	10.8	5.2	4.4	8.2	4.1

Source: U.S. Bureau of the Census, *American Community Survey*, 2010

Exhibit 3-5 Major Employers, Greater Waco Area

Employer	Employees
Baylor University	2,675
Waco School District	2,500
Providence Healthcare Network	2,397
L-3 Platform Integration	2,400
Hillcrest Baptist Medical Center	1,800
City of Waco	1,600
H-E-B	1,400
Wal-Mart Stores	1,323
Sanderson Farms, Inc.	1,041
Midway School District	1,014
Examination Management Services, Inc.	850
McLennan County	830
McLennan Community College	824
Veterans Administration Medical Center	800
Texas State Technical College	714
Cargill Value Added Meats	685
Veterans Affairs Regional Office	650
Allergan	640

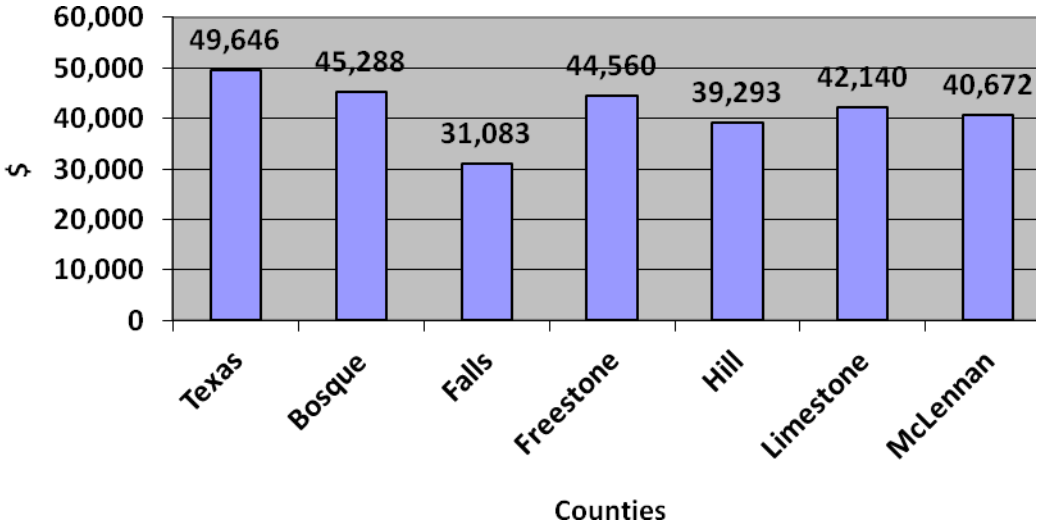
Source: Greater Waco Chamber of Commerce, June, 2013

The *HOTCOG Economic Development Strategy* has established the following key economic development catalyst projects for the region:

- Baylor Research and Innovation Collaborative
- Aerospace Center of Excellence at TSTC
- McGregor Industrial Park Rail Spur
- Falls County Infrastructure Assessment
- Bosque County International Partnership
- Freestone County Additional Airport
- Hill County Water/Sewer Improvements
- Waco Economic Transformation Plan

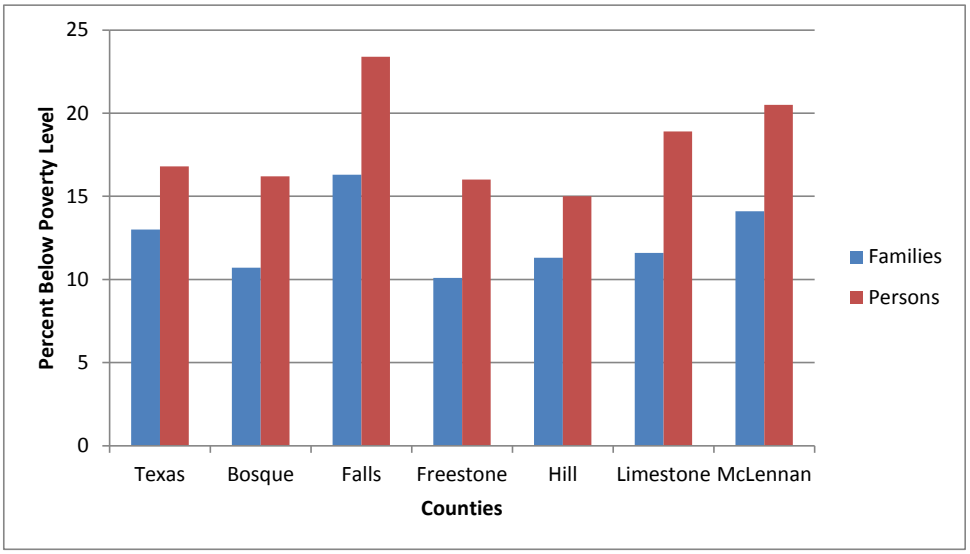
All HOTCOG counties have median household incomes below the State average (Exhibit 3-6). Recent statistics from the U.S. Bureau of the Census suggests that Falls and McLennan Counties have the highest poverty rates in the region with Waco's poverty rate nearly twice as high as the State average (Exhibit 3-7).

Exhibit 3-6 Median Household Income, HOTCOG



Source: U.S. Bureau of the Census, *American Community Survey*, 2010

Exhibit 3-7 Families and Persons Below Poverty Level, HOTCOG Region



Source: U.S. Census Bureau, ACS 2010 Estimates

3.4 WASTE GENERATION AND CHARACTERIZATION

A review of the most recent waste disposal data (2012) indicates that the total amount of waste disposed in landfills within the HOTGOG region is 687,351 tons. Based on the landfill data, a significant portion of this waste comes from outside the HOTCOG region. Without specific knowledge of the waste quantities originated from the six county regions it would not be practical to determine waste generation rates from the disposal data. The best available information on waste generation comes from the most recent Annual Report for the state

prepared by TCEQ. This TCEQ report indicates the statewide average waste disposal rate is 6.4 pounds per person per day. According to this report, the effect of recycling on MSW disposal is difficult to measure. Furthermore, an accurate statewide rate cannot be obtained because there is no requirement to report quantities of materials diverted before reaching the gate at landfills or processing facilities. In addition, there is an unknown number of entrepreneurs who salvage and collect recycled materials and freely transport them for sale to destinations across the region. Nevertheless, utilizing data in this report on ***reported*** tonnage of materials diverted from landfills, transfer stations, and composting facilities results in an estimated statewide recycling rate of five percent. The recycling rate in the HOTCOG region is believed to be more than five percent. However, in lieu of a means to quantify the actual rate, this report has utilized the statewide recycling rate of five percent, which, in turn, results in a total waste generation rate of 6.7 pounds per person per day. We recommend using this rate for future planning purposes to determine the solid waste generated within the HOTCOG region.

Exhibit 3-8 Municipal Solid Waste Generation Projections (tons)

Municipal Solid Waste Generation Projections

Sub Region	County	2000	2010	2020	2030	2040	2050
One	Bosque	20,989	22,219	23,513	24,634	25,100	25,643
	Hill	39,432	42,809	46,150	49,138	51,161	53,244
Two	McLennan	260,491	286,585	307,697	332,104	353,662	375,346
Three	Falls	22,663	21,797	22,771	23,274	23,243	22,998
	Freestone	21,798	24,176	25,522	26,806	27,688	28,580
	Limestone	26,902	28,528	30,666	32,470	33,937	35,543
Region		**392,274**	**426,113**	**456,320**	**488,426**	**514,791**	**541,355**

Solid waste generated and disposed in the HOTCOG region includes residential and commercial solid waste as well as construction demolition waste, industrial non-hazardous waste, wastewater sludge and other types of waste. Other types of waste include a range of other special wastes including tires, grease and grit trap waste and many others. According to the most recent TCEQ state annual report on municipal solid waste, the following percentages apply to solid waste disposed in landfills in Texas:

68% Commercial & residential

17% Construction demolition debris

4% Industrial waste

4% Sludge

15% Other

At this time, the State does not have detailed waste composition estimates for municipal solid waste for the state beyond the broad categories described in the *TCEQ's Annual Report*.

3.5 CURRENT WASTE MANAGEMENT SYSTEM

3.5.1 Roles, Responsibilities and Institutional Arrangements

3.5.1.1 Federal and State Level Agencies

The U.S. Environmental Protection Agency (EPA) is the principal agency involved in solid waste management at the Federal level. As described below, the EPA promulgated broad-sweeping federal rules governing solid waste disposal in 1991. The TCEQ is the environmental regulatory agency over solid waste for the State of Texas. Whereas approval authority for authorizing new or expanded MSW facilities is vested in the TCEQ's MSW Permits Section of the Waste Permits Division in Austin, local inspections for regulatory compliance purposes are carried out by staff located in TCEQ's 16 regional offices. The TCEQ along with the following state agencies: Texas General Land Office, Texas Department of Transportation, General Services Commission and the Department of Economic Development; comprise the Texas Recycling Market Development Board. This Board is responsible for policy recommendations concerning recycling programs at all state agencies.

3.5.1.2 Regional Level

The Heart of Texas Council of Governments (HOTCOG) was established in 1966, as a voluntary association of local governments. HOTCOG is the state designated regional planning agency for solid waste management. The goals and objectives outlined in the SWMP are intended to provide guidance for the continued development and enhancement of solid waste practices of the region. Whereas this plan will provide guidance for the planning period, in view of the dynamic nature of the HOTCOG region and the solid waste management systems serving the region, it is understood that there will be future amendments to the plan, on an as-needed basis.

3.5.1.3 Past Legislation and Regulations

Consistent with directives of Subtitle D of the Resource Conservation and Recovery Act (RCRA), the EPA promulgated 40 CFR 258, commonly known as the "Subtitle D" rules in 1991. The purpose of the Subtitle D rules was to establish minimum national criteria for all municipal solid waste landfills to ensure the protection of human health and the environment.

Since the Subtitle D rules were established to be implemented by the state agencies, in 1991, the Texas Department of Health (which preceded the TCEQ as the state agency responsible for regulating solid waste), revised the state regulatory program governing solid waste to reflect the requirements of Subtitle D. Texas rules governing solid waste, which underwent significant revision in 2006, continue to be contained in 30 TAC, Chapter 330, Municipal Solid Waste Management (MSWM). The implementation of the state Subtitle D rules impacted virtually all regions of Texas by requiring (1) the upgrading of landfills that remained open after the effective date of the rules and (2) the closure of a significant number of disposal sites that were not upgraded. Being designed to protect human health and the environment, TCEQ's Chapter 330 rules impact a broad range of landfill considerations, including the following:

- Restrictions on the location of municipal solid waste (MSW) landfills, including the following: airport safety, floodplains, wetlands, fault areas, seismic impacts zones and unstable areas.

- Standards for operating MSW landfills, including the following: excluding hazardous waste; covering of waste materials; control of explosive gases; storm water management; protection of surface water; restricting liquids and the control of air emissions.

- Design standards for composite liners and leachate collection systems at MSW landfills to ensure the protection of groundwater. See Exhibit 3-9

- Groundwater monitoring to verify the integrity of the groundwater protection systems and provisions for corrective action.

- Closure requirements.

Exhibit 3-9 Construction of composite liner system at City of Waco Landfill

- Requirements for maintaining post-closure care for a period of at least 30 years following cessation of waste filling.

Existing landfills that could not comply with these standards were required to go through the process of closure and post-closure care. As a result of the implementation of these rules, numerous landfills were closed in the HOTCOG region, resulting in the four operating landfills that serve the region at this time. An inventory of closed landfills is included in Appendix E of this SWMP.

3.5.1.4 Current Legislation and Regulations

The EPA has implemented stricter requirements on landfills over the previous decade through the 1990 Clean Air Act. One of these requirements is the control of landfill gas emissions. In

1996, the EPA created New Source Performance Standards (NSPS) and New Emission Guidelines for municipal solid waste landfills. In addition, in 2006, TCEQ revised the state rules to enhance the efficiency of permitting landfill gas to energy projects in Texas.

With the closure of many landfills in the HOTCOG regions, public access to disposal sites has been reduced and disposal costs have increased. Whereas the four landfills have been upgraded to meet the state and federal environmental protection standards, the related changes in the solid waste management system have resulted in an unintended consequence of increased illegal dumping in the region and throughout the state.

3.5.2 Waste Disposal and Capacity

All landfills in the state of Texas are required to submit an annual report to the TCEQ which summarizes various data on waste received for the fiscal year (FY). To obtain information on the active MSW landfills in the HOTCOG region, SCS contacted the TCEQ, which provided the data summarized in Exhibit 3-10. The data in these tables has been derived from the information contained in the TCEQ annual report for FY 2012. The reports for FY 2012 include the period September 1, 2011 through August 31, 2012.

Exhibit 3-10 Permitted Landfills in HOTCOG Region

Landfill Name	County	Waste Received in FY 2012 (tons)	Remaining Capacity (tons)	Remaining Life (1) (years)	Counties Served in FY 2012
Republic Itasca LF	Hill	291,734	46,795,000	160	18
Republic Mexia LF	Limestone	34,638	5,719,000	165	8
Lacy Lakeview LF (3)	McLennan	110,388	1,005,000	8	7
City of Waco LF (4)	McLennan	250,592	3,235,000	13	12
TOTAL		687,352	56,754,000	83(2)	

(1) Remaining life at 2012 tonnage received.
(2) Remaining life based on tonnages received at these four landfills in FY 2012
(3) Operated by Waste Management
(4) Operated by City of Waco

Source: site-specific annual reports for the above landfills as provided by TCEQ

As indicated above, the remaining capacity of the landfills in the region is 56,754,000 tons, of which 3,235,000 tons or six percent is controlled by the public sector and 53,579,000 tons or 94% is controlled by the private sector. Also, 82% of the region's landfill capacity is at the Itasca Landfill, located in the northern part of the HOTCOG region.

As indicated above, the capacity of the City of Waco Landfill, as currently designed and permitted, will be consumed within the next 13 years. As described in Section 3.5.11, Siting and Permitting, a new waste management facility, such as a landfill or waste conversion facility, or expanding an existing landfill can require many years. The City of Waco is planning to address this impending need for capacity as a key aspect in the development of its 20-year comprehensive solid waste management plan, which will be undertaken during fiscal year 2013-2014.

The 2011 TCEQ report on statewide disposal practices noted that 28,817,000 tons of MSW were disposed in the state's MSW landfills in 2010 and that the total remaining capacity of the active MSW landfills in Texas was 1,830,883,000 tons, representing a remaining operating life of 60 years. In view of the ability of waste to flow without limitations across region boundaries, SCS reviewed the landfill capacity of contiguous and nearby COG regions in assessing the future availability of landfill capacity for the HOTCOG region. The remaining landfill capacities of the nearby COG regions are summarized in the following table:

Exhibit 3-11 Summary of Remaining Landfill Capacity of Nearby COG Regions

COG	Population	No of Landfills	Remaining Capacity (Tons)	% of Total	Years
4 North Central Texas COG	8,020,289	21	369,151,624	21.43	46
6 East Texas COG	623,294	4	132,375,768	7.69	212
7 West Central Texas COG	401,091	8	97,398,290	5.66	243
12 Capital Area COG	1,986,713	5	85,510,241	4.96	43
13 Brazos Valley COG	290,875	1	333,025	0.02	1
14 Deep East Texas COG	515,805	4	43,929,829	2.55	85
23 Central Texas COG	413,119	2	8,978,260	0.52	22
Total of 7 nearby COG Regions	**12,251,186**	**45**	**737,677,037**	**42.8**	
Totals (of all 24 COGs)	**25,213,445**	**190**	**1,722,334,000**	**100**	**60**

Source: TCEQ, *Municipal Solid Waste in Texas, A Year (2011) in Review*

Also noteworthy is that seven of the 13 counties that are adjacent to the HOTCOG region have no landfills. However, from a regional perspective, of the seven nearby COG regions, only the Brazos Valley region has limited remaining landfill capacity. As such, at this time, it appears that the total landfill disposal capacity from the "big picture" perspective, is not a ***short-term*** concern either in the HOTCOG region or in the state of Texas. However, in view of the significant time required to develop new disposal capacity, not having an immediate concern should not be construed to suggest "no action" with regard to disposal capacity. As will be discussed in subsequent sections of this report, assessing the need for additional disposal capacity over the 20-year planning period requires consideration of various other factors including the proximity of the landfills to the population centers and the interest of the public sector in maintaining control over a certain portion of the landfill capacity.

3.5.2.1 Types of Wastes

Whereas there are various types of wastes disposed in MSW landfills, primary categories of waste are: residential, commercial, and construction/demolition (C&D) debris. These three waste types make up the vast majority of the waste stream, i.e., 85 percent of the MSW disposed in the state. However, in the HOTCOG region, residential, commercial, and C&D debris made up only 54 percent of the waste stream disposed of in the four landfills in the HOTCOG region in FY 2012.

In reviewing the data from the annual reports of these four MSW landfills, as well as the TCEQ's annual report on solid waste management in the state, a comparison can be made of landfill practices in the HOTCOG region vs. statewide practices, as indicated in Exhibit 3-12.

In reviewing records of brush at the City of Waco landfill over recent years, it has been observed that the City's brush tonnage has more than doubled since 2009 from less than 10,000 to approximately 20,000 tons this year. The City of Waco has an ongoing program that diverts trees and brush from the landfill. Brushy waste is chipped and stockpiled for beneficial use at the City's landfill. The increase in brush is believed to be, at least in part, attributable to the

historic drought that began in Texas in October of 2010 and continues in many areas of the state. This drought has resulted in widespread tree deaths throughout the state. Statewide it is estimated that over 300 million trees were lost in rural areas and as many as five million were lost in urban environments. This phenomenon has resulted in large numbers of dead trees becoming a solid waste management issue for many local governments and citizens. Given that this increase is due primarily to the drought, it is anticipated that elevated levels of brush material will continue to impact the waste stream in the HOTCOG region over the next five to ten year period.

Exhibit 3-12 Summary of Categories of Waste Received at Landfills in HOTCOG Region in FY 2012 (in tons)

Waste Categories	Itasca	Mexia	Lacy Lakeview	Waco	HOTCOG Totals
Municipal (includes residential and commercial)	12,701	25,932	36,169	198,989	273,791
C&D debris	8,769	3,389	20,738	45,479	78,375
Other	230,522	5,317	53,482	6,123	295,444
Total Annual Tonnage	**251,992**	**34,638**	**110,389**	**250,591**	**647,610**

Source: site-specific annual reports for the above landfills as provided by TCEQ.

3.5.2.2 Waste Imported from Other Regions

As indicated in Exhibit 3-13, each of the four landfills in the HOTCOG region provide service to at least four of the counties within the region, as well as various counties outside the region. Waste is imported from seven counties outside of the HOTCOG region.

Exhibit 3-13 Counties Served by Landfills in HOTCOG Region

Landfill	HOTCOG Counties Served						Other Counties Served
	1	2	3	4	5	6	
Itasca Landfill	X	X	X	X	X	X	Bell, Dallas, Denton, Ellis, Hamilton, Hood, Johnson, Leon, Navarro, Parker, Somervell, Tarrant
Mexia Landfill		X	X	X	X	X	Leon, Navarro, Robertson
Lacy Lakeview	X		X	X		X	Bell, Coryell, Hamilton,
City of Waco Landfill	X	X		X	X	X	Bell, Coryell, Ellis, Hamilton, Lampasas, Milam, Robertson

Source: site-specific annual reports for the above landfills as provided by TCEQ
Note: 1: Bosque; 2: Falls; 3: Freestone; 4: Hill; 5: Limestone; 6: McLennan

3.5.3 Waste Transfer, Storage, Treatment, and Processing

3.5.3.1 Waste Transfer Stations

TCEQ regulations (30 TAC §330.3) provide definitions that clarify how various MSW facilities are addressed within TCEQ's regulatory framework. In particular, the following definitions and related TCEQ approval processes are pertinent to waste transfer:

- Citizens' collection station (330.3(20)) is defined as, "A facility established for the convenience and exclusive use of residents (not commercial or industrial users or collection vehicles), except that in small communities where regular collections are not available, small quantities of commercial waste may be deposited by the generator of the waste. The facility may consist of one or more storage containers, bins, or trailers." As stated in 330.11(e)(1), the TCEQ requires a notification for citizens' collection stations.

- Low volume transfer station (330.3(83)) is defined as, "A transfer station used for the storage of collected household waste limited to a total storage capacity of 40 cubic yards located in an unincorporated area that is not within the extraterritorial jurisdiction of a city." As required by 330.11(g), operation of a low-volume transfer station requires notification of the TCEQ and compliance with the following conditions.

  - The operator must own or otherwise effectively control the facility.

  - Prior to notification, the operator must coordinate with the county authority to ensure compliance with all appropriate ordinances.

  - The operator must notify the adjacent landowners, by first-class mail, concurrent with notification of the TCEQ.

  - Collected waste must be sent off-site to an authorized facility at least weekly.

- Transfer station (330.3 (57)) is defined as, "A facility used for transferring solid waste from collection vehicles to long-haul vehicles (one transportation unit to another transportation unit)…"

A transfer station can be authorized by the TCEQ by either a MSW permit or a MSW registration. As provided for in 330.9(b), the registration approval process is somewhat more streamlined than the permitting process, but must comply with at least one of the following restrictions:

- Location with a municipality with a population of less than 50,000.

- Location within a county with a population of less than 85,000.

- The proposed facility will transfer 125 tons per day or less.

- The proposed facility will be located within the permitted boundaries of an MSW Type I or Type IV facility.

As provided for in TCEQ's regulations (330.9(f)), transfer stations that include a material recovery operation may also be approved through the more streamlined registration process if they meet the following requirements:

- A demonstration, satisfactory to the TCEQ that at least 10% of the incoming waste stream will be recovered for reuse or recycling.

- Waste will be transferred to a landfill that is not more than 50 miles from the facility.

Lastly, transfer stations can also be approved as a Type V MSW permitted facility, which is more complex than a registration and, if opposed, could be subject to a contested case hearing.

The *2013 Solid Waste Survey* indicated that cities in the HOTCOG region are being served principally by private waste haulers which are hauling direct to various landfills without using transfer stations. Based on our review of the TCEQ annual report and the results of the 2013 Solid Waste Survey of MSW practices in the region, there are currently no private sector or public sector transfer stations in the HOTCOG region.

3.5.3.2 Waste Storage, Treatment and Processing Facilities

Based on our review of the TCEQ annual report and the results of the *2013 Solid Waste Survey*, there are currently no facilities that are storing or treating municipal solid waste in the HOTCOG region. Recycling facilities are discussed in Sections 3.5.7 and 3.5.8.

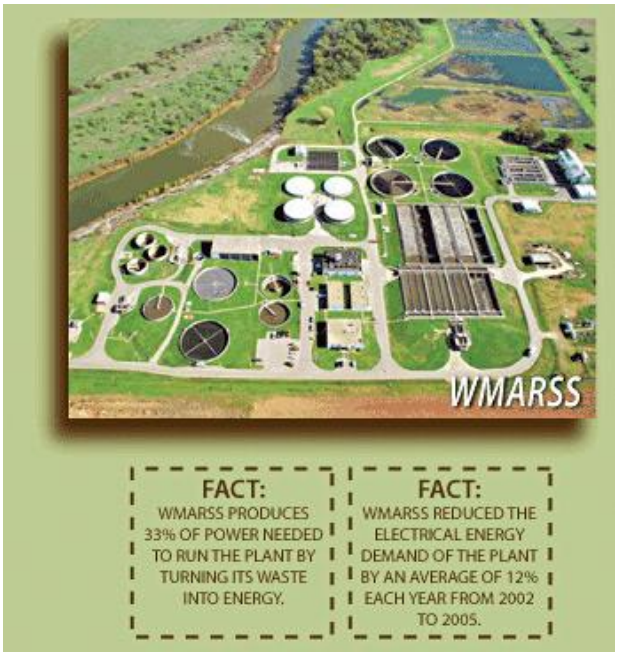
3.5.4 Management of Wastewater Treatment Sludge (Biosolids)

Based on review of the annual reports submitted to the TCEQ from the four MSW landfills in the HOTCOG region, biosolids comprise less than one percent of the waste received at these landfills. The Waco Metropolitan Area Regional Sewerage System (WMARSS) wastewater treatment plant serves approximately 175,000 people from the cities of Waco, Bellmead, Hewitt, Lacy-Lakeview, Lorena, Robinson, and Woodway (Exhibit 3-14).

The biosolids from this plant are processed using anaerobic digestion prior to dewatering using belt filter presses and meet the criteria for "Class A" Biosolids – able to be used for a broad range of applications. The belt press dewatered sludge then is dried to pelletized biosolids, which are used as an agricultural soil amendment. Although a less desirable disposal option, biosolids also may be landfilled.

Methane produced from the biosolids digestion process is utilized in a combined heat and power (CHP) generator which produces a portion of the electrical power required to operate the WMARRS plant. The water jacket heat from the CHP provides heat for the biosolids dryer/pelletized process. Other materials such as food grease, fats, and organic waste from food processors are hauled to the plant and are digested to produce additional methane. Expanded onsite waste-to-energy options are currently being evaluated by staff.

Exhibit 3-14 WMARSS Treatment Plan



Source: WMARSS, 2013

3.5.5 Waste Collection and Transportation Services

The 2013 Solid Waste Survey was conducted of cities and counties within the HOTCOG region to assemble information on the existing solid waste collection practices. Appendix B provides a summary of the data obtained in the survey.

Based on the responses, all of the residential customers located in cities within the region except Waco are served by private haulers. A list of known private haulers based on survey results and follow up discussions with local officials and private haulers is included as Exhibit 3-15.

Exhibit 3-15 List of Haulers in HOTCOG Region

Private Haulers	
Applied Recovery System Waco, TX 76712	C & B Enterprises 236 W. Cours Belmont, TX 76640
Cen-Tex Shred Solutions, LLC Waco, TX 76712	Certi Shred Waco, TX 76701
ECD Waste Services, Inc. Corsicana, TX 75151	Freestone Disposal Oakwood, TX 75855
Himes Service Co., Inc. Waco, TX 76706	Kerr Jimmie Refuse Service China Spring, TX 76633
M. Lipsitz and CO. Waco, TX 76703	Mayne Machinery Co., Inc. Woodway, TX 76712
Midstate Environmental Waco, TX 76705	Owens-Illinois Inc. Glass Recycling Coordinator Waco, TX 76711
Progressive Waste Solutions (IESI) Independent Env. Services Inc. McGregor, TX 76657	Republic Waste Services Allied Waste Services Itasca, TX 76055
Republic Waste Services Olympic Waste Services Corsicana, TX 75151	Republic Waste Services BFI/Trinity Waste Systems Mexia, TX 76667
Republic Services Mexia, TX 76667	Safety-Kleen-Waco Oil Recycling Waco, TX 76712
Star Sanitation Whitney, TX 76692	Sunbright Disposal Services Waco, TX 76712
City of Tehuacana Service Provider Tehuacana , TX 76686	Total Recycling Solutions, LLC Mart, TX 76664
Vermeer Elm Mott, TX 76640	Waco Wood Recycling Woodway, TX 76712
Waste Management (Centex Waste Management) Temple, TX 76504	Wise Recycling LLC's Waco, TX 76706

Source: HOTCOG database

Collection service to residents in these cities is either once or twice weekly with monthly rates ranging from $12.00 to $17.50 per month. Nine respondents or 27% of the responding cities indicated that residents have garbage pick-up twice weekly. Curbside collection is the primary type of service provided to residents; a few cities indicated that service is provided by individual subscription or by drop-off only, such as Streetman in Freestone County. Commercial collection of waste within the cities is provided by private haulers that contract directly with the businesses. Other services identified by some cities include bulky waste pick-up and special yard waste pick-ups ranging from once a week to once per year.

Residential garbage collection in the rural unincorporated areas of the HOTCOG region is provided by private waste haulers through subscription type service. A typical collection service includes a large container 90 gallons or more that is picked up weekly at a fixed monthly cost. Some haulers offer services that involve several residents using a common container that is picked up weekly. Rates vary depending on the location and service, but typically range from 20 to 30 dollars a month. At this time, there is insufficient data on what percentage of residents in

unincorporated areas are being served with collection of solid waste. Based on responses to our local government and county surveys as well as follow up meetings and interviews with county enforcement personnel, there are many areas of the rural unincorporated sections of the six county HOTCOG region that are not served. This often results in problems such as illegal dumping or unauthorized use of disposal containers provided to others.

Yard waste collection is provided to residents in many of the cities in the region and collection and recycling centers in some locations accept yard waste. Based on the information available, there are no large scale composting operations in the HOTCOG region at this time.

Curbside collection of bulky waste items such as furniture is offered by many cities and private haulers on an infrequent basis. Fees for this service vary widely depending on the City and contracts with private haulers. Collection of special items such as refrigerators, electronics and other large items is handled by one or more of the citizens' collection and recycling facilities in the region.

The largest public collection program in the region is operated by the City of Waco's Solid Waste Department. Exhibit 3-16 is a brief summary of the solid waste residential collection services provided by the City. Briefly, residential collection is conducted using a system of automated trucks and rolling carts (Exhibit 3-17). The Department only collects materials generated by residents, defined as those who occupy a home and pay for solid waste services via their water bill. If materials are generated by commercial sources (i.e., contractors and businesses), from tenant evictions, or are on vacant lots, the Department will collect items only if the property owner agrees to pay for collection services.

The Department also offers solid waste and recycling services for businesses in Waco. A variety of services are offered and options are available to fit their needs and budget (e.g., various sized dumpsters, roll off containers, and frequency of collection).

Exhibit 3-16 Solid Waste Collection Services, City of Waco

Weekly	Every Other Week	At Customer's Request
Curbside collection of one grey trash cart	The blue (recycling) and green (yard waste) carts are collected on alternating weeks on the same collection day as the trash.	Curbside Bulky Waste Collection: Residential Solid Waste Services include the free pickup of one 5'x 4'x 4' (maximum) bulky waste pile. Charges apply to larger piles. Collection of materials generated by commercial sources (i.e., contractors and businesses), from tenant evictions, or vacant lots, is done for an additional fee.
A second trash cart is available for an extra charge of $4/month	Residents are provided, at their request, one 95 gallon blue (recycling) and one green (yard waste) carts at no extra charge.	Curbside Brush Collection: Residential Solid Waste Services include the free pickup of one 5'x 4'x 4' (maximum) brush waste pile which was generated by residents, defined as those who occupy a home and pay for solid waste services via their water bill.
	A second recycling or yard waste cart is available for an extra charge of $4/month.	

Source: City of Waco, 2013

Exhibit 3-17 Automated 95-gallon Rollout Cart Provided to Waco Residents

Source: City of Waco, 2013

3.5.6 Citizens' Collection Stations

Citizens' Collection Stations (CCS) are defined by TCEQ rules as stationary facilities that may be established by local governments or other entities to allow citizens to dump trash and other solid waste materials for later transport to permitted disposal facilities. These types of facilities do not require a permit or registration from TCEQ provided they do not allow waste collection vehicles to dump their loads at the station. Collection stations typically consist of open top containers that are set up at a convenient location for citizens to access, and or operated by a municipality or county in cooperation with private haulers.

The six county HOTCOG region has a limited number of collection stations that accept some types of solid waste and recyclables. These facilities have been established by several municipalities as well as by county governments within the region.

Exhibit 3-18 below provides a brief summary of the CCS locations and materials that are availability to residents and cost for a typical citizen's load. This list only includes collection stations that allow citizens to bring solid waste to the station for disposal. Recycling facilities are listed separately in a later section. Collection stations are not considered transfer stations as they are not allowed to receive waste from waste collection trucks.

Freestone County has two stations that are available to residents in the northernmost city of the county, Streetman and the southern end of the county near the town of Dew. These stations each have enclosed containers to receive household garbage and open top containers for bulky wastes. A tire trailer is also onsite to accept tires. Fees range from $1.00 per bag for trash to $5.00 for a pick-up load. Separate charges apply for tires. Both collection facilities are open several days per week and are staffed by the county. (See Exhibit 3-19.)

Falls County has one collection station located in the City of Marlin that is open to City and County residences. The station is open on Saturdays and has a fee schedule that charges

residents $3.00 per trash bag up to $30.00 for a pick-up load and non- residents $4.00 per bag up to $40.00 per pick-up load. Tires are also accepted at this collection station. Disposal rates at the Marlin site are significantly higher than other collection facilities in the region. (See Exhibit 3-18.)

Exhibit 3-18 City of Marlin / Falls County Citizens' Collection Station

McLennan County has one collection station that is located in Waco and operated by the City. This facility is primarily a recycling center but does accept some types of solid waste including bulky items and white goods. Tires are not accepted at any of these stations. The Bosque County collection station is located in Meridian and is limited to residents of the City of Meridian only. This CCS accepts most types of solid waste and recyclables. The facilities typically charge a flat rate for a typical pickup load of garbage or debris. Proof of residency is required.

Exhibit 3-19 Citizens' Collection Stations in HOTCOG Region

County	Name	City	Operator	Type	Types of Waste Materials Accepted	Recyclables Accepted	Cost (4)	Availability to Residents in HOTCOG
McLennan	Cobbs CCS	Waco	City of Waco	R/SW	(2)	Yes	None	Available to all
	Waco LF CCS	Waco	City of Waco	SW/R				
Freestone	Streetman CCS	Streetman	Freestone County	SW	(1),(2),(3)	No	Varies	County
	Dew CCS	Dew	Freestone County	SW		No	Varies	County
Falls	Marlin CCS	Marlin	City of Marlin	SW/R	(1),(2)	Yes	$3-$5/ load	City and County
Bosque	Meridian	Meridian	City of Meridian		(1),(2)	Yes	None	City of Meridian

(1) Household Garbage
(2) Bulky Waste
(3) C & D Materials
(4) No cost to City of Waco residents. Other sites have rates based on residency within the city or county.

As indicated above, there are currently three CCSs that are located in the HOTCOG region available to receive solid waste directly from the citizens of the municipalities and three of the six counties within the region. Two are located in Freestone County and one in Falls County. Based on discussions with county environmental officers, these facilities are heavily used by residents and those with lower fees are used much more frequently than the other facilities that charge higher fees to dump loads. There are currently no collection stations that serve unincorporated areas in McLennan County, Hill County, Limestone County or Bosque County outside of Meridian. As previously stated, the Cobbs facility located in Waco accepts a wide range of recyclable materials as well as some bulky waste and white goods. Household garbage is not accepted at the site, but the City of Waco landfill has a citizens' collection site at the landfill that accepts the full range of solid waste accepted at the landfill.

3.5.6.1 Collection Events

Many local governments within the region offer collection events within the county to provide an alternative to county residents for disposal of large quantities of solid waste. Freestone County holds two collection events in cooperation with the local ISD in Fairfield. These events are open to county residents to dispose of most solid waste materials, including a variety of bulky items and recyclables. Meridian provides residents with a special collection twice per year for bulky items. Waco Solid Waste Services supplies roll-off dumpster service at three Neighborhood Clean ups each year. Two of the cleanups are held on predetermined dates that coincide with

Baylor's Steppin' Out (community volunteering days). The other date can be chosen by the Neighborhood Association and is coordinated with Keep Waco Beautiful. Many cities within the region also offer special collection of specific items that are not typically collected with normal pick up.

3.5.7 Recycling Services and Facilities

In addition to the Citizens' Collection Stations (CCS), there are a number of facilities within the region that are involved in recovering materials from the waste stream and diverting them from being disposed in the landfills. These range from drop-off centers that collect separate materials for recovery to facilities that purchase specific materials such as metals and cardboard. Several cities within the region have curbside collection of recyclables that are processed by local recycling facilities in Waco. According to the 2013 Solid Waste Survey from local governments, Waco, Hewitt, Woodway and Lacy Lakeview provide curbside collection of recyclables. In addition to this, there are numerous schools, businesses and other private entities that have recycling programs to collect paper and other materials that are collected and distributed to recycling facilities both inside and outside the region. A list of these facilities is included in HOTCOG's database. There appears to be one major recycling facility that processes single stream materials from the various curbside collection programs and other sources within the COG region. Sunbright Recycling is located in Waco and provides service to the HOTCOG region as well as other areas of central Texas. There are several facilities that receive metals for recycling including Lipsitz and CMC.

The City of Waco's curbside recycling program started as a pilot scale program for paper and cardboard only in 2000. As interests grew, more households were added. Eventually the program became a single-stream curbside program which includes all paper products, metals, and all plastics except Styrofoam. The current participation rate is approximately 28.5% of households that voluntarily participate in the curbside program. That program has helped to divert a lot of materials that would have otherwise gone into the landfill and taken up space there.

Participation in the City of Waco Curbside Recycling program is voluntary, not mandated. From a total of 34,559 residential accounts the total number of participating households is 9,568 (27.7%). On an annual basis, the curbside recycling program collects approximately 3,000 tons of recyclable materials. It has been estimated that the average City of Waco household recycles approximately 520 pound per year. By weight, the greater Waco MSA residential recycling rate has been estimated to be 16.9%. A total of 79 businesses, 7 residential apartments, 20 public elementary schools, 21 secondary public schools and 4 private schools participate in recycling. A breakdown of the weekly number of households for recyclables and yard/brush collection is presented in Exhibit 3-20 below.

Exhibit 3-20 City of Waco Curbside Recycling

Households Serviced Weekly (2012 Data) Day Week	Households Serviced – Recyclables*	Households Services - Yard/Brush	Total Customers	Average Customers Service/Day
Monday	2,330	533	2,863	550.58
Tuesday	804	194	998	191.92
Thursday	1,075	310	1,385	266.35
Friday	2,050	584	2,634	506.54
Total	6,259	1,621	7,880	378.85

Source: City of Waco, 2013

Recycling drop-off centers are located in several cities the within the region. There are drop-off facilities available to citizens in McLennan, Limestone, Hill and Bosque counties. These facilities accept a variety of recyclable materials from residents of the cities and county where they are located. A brief description of these facilities along with information on their availability to residents is provided in the following paragraphs.

3.5.7.1 Cobbs Recycling Center

The Cobbs Recycling Center, also known as the Cobbs Citizens' Convenience Center (Cobbs), in Waco serves as a citizens' collection station as well as a recycling drop-off center. Cobbs is an approximately 1.6 acre facility that accepts recyclable materials, brush and bulky waste from the City of Waco as well as surrounding unincorporated areas and other cities where these services are not currently available.

Exhibit 3-21 Cobbs Recycling Center

The Cobb's Recycling Center accepts drop off paper (i.e. advertising circulars and junk mail paperboard packaging, cardboard boxes, newspaper magazines and catalogs, phone books, office paper and carbonless paper), glass, metals (aluminum, copper, tin and steel), and both

commodity grade and engineering grade plastics with SPI Resin Codes **(**Polyethylene Terephthalate (PETE) #1, High Density Polyethylene (HDPE) #2, Polyvinyl Chloride (PVC) #3, Low Density Polyethylene (LDPE) #4, Polypropylene (PP) #5, Polystyrene (PS) #6 and Polycarbonate #7. The center does not accept Styrofoam. The City of Waco operates a citizen's convenience center at the City's Landfill. At that location materials such as metals and cardboard are diverted from landfill disposal. See Exhibit 3-22

Exhibit 3-22 Citizens' Convenience Center at Waco Landfill

3.5.7.2 Baylor University's Recycling Program

Baylor University has an aggressive recycling program that is managed by the Office of sustainability at the university. In 2012 the University diverted 440 tons of recyclable materials form the campus including paper, cardboard and plastics. This equates to a diversion rate of 26 percent by weight.

3.5.7.3 Other Recycling Programs in the Region

Local ISDs, the TSTC and many other businesses have active recycling programs that collect recyclable materials. Although the volumes are not tracked, it is believed that these programs make a significant contribution to the annual volume of materials diverted from the MSW landfills in the HOTCOG region.

3.5.7.4 Groesbeck Recycling Facility

The City of Groesbeck operates a recycling drop-off and processing center for residents of the City of Groesbeck and Limestone County. The facility has been in operation for several years. It serves Limestone County as well as the City of Groesbeck. Materials accepted include paper plastic and cardboard. The Groesbeck Recycling Facility receives and compacts these materials using a baler. The materials are stored on site until sufficient amounts are accumulated to make full loads for shipping to end users. They do not charge residents of the county to drop-off materials and are open five days a week for half a day. The Groesbeck facility is an excellent

example of how recycling in rural areas can offer a sustainable recycling service to citizens at a low cost. This facility has operated for many years and continues to provide good service to the citizens of the county.

Exhibit 3-23 City of Groesbeck /Limestone County Recycling Center

3.5.7.5 Bosque County

Bosque County has a recycling drop-off center in Meridian Texas at the Citizens' Collection Station. This location will accept paper, plastics and metals. The facility is serviced by private haulers that transport materials to a processing center.

3.5.7.6 Hill County

Hill County has a recycling drop-off bin located outside the courthouse in Hillsboro. It accepts a limited number of recyclable materials.

3.5.7.7 Private Facilities

As mentioned above, a number of private companies, retailers, schools, religious groups and other entities are involved with recycling in the HOTCOG region. These efforts are effectively removing substantial quantities of paper, metals and other materials from the solid waste stream and recovering the material for reuse.

3.5.7.8 Private and Non-Profit Profit Recycling Programs

Foremost among the many private and non-profit educational and beautification programs in the HOTCOG region are the programs undertaken by Keep Waco Beautiful and McLennan Master Gardeners Program. Both of these programs are briefly discussed in the paragraphs below.

Keep Waco Beautiful is an affiliate of Keep Texas Beautiful and Keep America Beautiful. What once started as a small committee dedicated to beautifying the community is now a non-profit organization with over 13,000 volunteers and a plethora of activities yearly. The organization's mission is to help make Waco a cleaner, healthier, safer and more beautiful place to live, work

and play. It has supported concentrated cleanup, beautification and anti-litter programs (Exhibit 3-24) and is dedicated to teaching people in the greater Waco area to take responsibility for enhancing their community environment through action, education, and involvement (Exhibit 3-25).

Exhibit 3-24 Neighborhood Cleanup Sponsored by Keep Waco Beautiful

Source: Keep Waco Beautiful, 2013

Exhibit 3-25 Educational Program of Keep Waco Beautiful

Source: Keep Waco Beautiful, 2013

One of the largest recycling events in Waco is an annual recycling fashion show, "Project Greenway." The program encourages making stylish fashion out of reused garments and renewable resources. Designers and fashion students create clothes and handbags with fun and creative mediums such as newspapers and garbage bags, and the results are judged by a panel of Baylor students and members of the Waco community. The program allows students and volunteers to organize into teams and create an original style design for the show.

Exhibit 3-26 Project Greenway, Waco

Source: Project Greenway, 2013

Exhibit 3-27 McLennan Master Gardeners Program

Source: McLennan County Master Gardeners Program, 2013

3.5.8 Commercial Recycling Facilities

There are several major recycling facilities that operate in the region receiving and processing recyclable materials. The primary facilities serving the region include Sunbright, Lipsitz and CMC.

Sunbright Recycling Facility in Waco receives and processes paper, cardboard and plastics from a variety of sources. It is the designated processing facility for the curbside recycling programs within the HOTCOG region including Waco, Woodway, Hewitt and Lacy Lakeview. Sunbright operates a single-stream processing facility with capacity to process up to 110 tons per day based on the current single shift operations. Sunbright's Waco facility has the capacity to service the

entire HOTCOG region as well as communities outside the six county area. Sunbright also receives materials from other counties within the HOTCOG region from private haulers, individuals, and businesses. Sunbright representatives have indicated that their Waco facility has excess capacity and with the addition of a second shift could increase production to 250 tons per day. Furthermore, Sunbright could add equipment or personnel to handle much larger volumes of recycled materials, as demand requires.

Lipsitz is a commercial metals recycler that has been operating in Waco for almost 100 years. The facility receives both ferrous and non-ferrous metals including aluminum cans. The City of Waco sends scrap metal to Lipsitz, as do other cities and businesses within the region. Lipsitz also provides hauling services for scrap metals.

CMC is a commercial metals recycling company with a facility is Waco that provides services to Waco and surrounding areas. CMC collects both ferrous and non-ferrous metals from the surrounding areas, including Waco ISD.

Green Fiber, Inc. processes paper to create insulation and other products. The Waco facility is actively seeking recycled material to use as feedstock at this facility. They have recently added hauling services to increase the quantity of materials received for processing at this facility.

These facilities based in the region have the capacity to process current and future recyclable materials that could result from expanded recycling programs within the region. A summary table of the major recycling facilities serving the region and the materials that they receive and process is included in Appendix G.

3.5.9 Household Hazardous Waste Management Programs

Whereas landfills, transfer stations, material recovery facilities which manage MSW are regulated by the MSW Permits Section of TCEQ, the Pollution Prevention and Education branch of TCEQ provides oversight of Household Hazardous Waste (HHW) activities. In 2008, the TCEQ promulgated new regulations (30 TAC, Chapter 335, Subchapter N) addressing the management of household hazardous wastes (HHW). In addition to defining various HHW management activities (e.g., HHW point-of-generation pick-up service, HHW mobile collection, HHW collection events, HHW aggregation, HHW permanent collection center, etc.), Subchapter N includes requirements for managing HHW area also defined. These requirements include:

- Notifying the TCEQ of HHW activities prior to conducting those activities, using forms and procedures defined by TCEQ.
- Developing and following a completed operational plan, which will include numerous details such as provisions for staffing, description of HHW materials that can be received, plans for disposition of HHW, evidence of competency, health and safety plan, provisions for inclement weather, etc.
- Staff training requirements.
- Storage limitations.

- Shipment of aggregated HHW only to facilities approved by TCEQ for the management of HHW.
- Transportation of aggregated HHW by registered hazardous waste transporters.
- Maintaining records and reporting to the TCEQ annually.
- Financial assurance for HHW permanent collection centers operated by the private sector.

HHW is managed within the HOTCOG region through collection events. Currently, no permanent facilities that are equipped to handle HHW operate in the region. The City of Waco Solid Waste Services Department holds one HHW annual collection event that has accepted the following: latex and oil based paints, paint thinners, household batteries, anti-freeze, motor oil and tires. Liberty Tire Recycling, a national tire recycler with operations based in Midlothian, Texas, provides the transport and recycling services for used tires. Previous household hazardous waste collection events were conducted through partnerships between the cities of Waco, Woodway, Hewitt, and McGregor.

Exhibit 3-28 Joint City Household Hazardous Waste Collection Event (Waco, Woodway, Hewitt, Lorena and Lacy Lakeview)

Source: KXXV, May 18, 2013

3.5.10 Illegal Dumping

Based on responses to the *2013 Solid Waste Surveys* as well as follow up meetings and interviews with county enforcement personnel, the issue of illegal dumping remains an important solid waste challenge for the HOTCOG region. Programs for addressing illegal dumping have been in place for many years in each of the six counties within the HOTCOG region. These programs include enforcement, education and amnesty events. The enforcement programs are

run by the environmental control officers for each county. Dumping cases are generally characterized into one of the following categories:

- Household garbage
- Construction demolition
- Tires
- Oil related
- Other including medical waste, oil exploration related waste, and wastewater

Most of the dumping involves the first two categories with tires being reported as significant problem as well. Trends in McLennan, Limestone, Freestone and Hill counties indicate that case loads are steady with some increases being seen in Hill and Freestone as access to disposal sites is limited. A general overview of illegal dumping problems for four of the counties is provided in the following table:

Exhibit 3-29 Illegal Dumping Data and Observations

County	Number of Cases Reported in 2013	Comments
Limestone	31 (partial total)	Transitioning the enforcement responsibilities for illegal dumping has likely impacted the database on illegal dumping. 3 of the reported cases in 2013 involved more than 500 pounds.
Hill	64 (31 tons)	Waste materials include construction, household garbage and tires. The county data indicates that there may be underreporting of dumping in at least one precinct so the actual number of dumping cases is most likely higher than the reported 64 cases.
Freestone	1185 (solid waste)	Also, 164 cases involving liquids, including oil field waste. Recently, the hours Citizens Collection Stations (CCS's) have been cut back from six days to three with limited hours. In addition, construction waste is no longer accepted at the CCS's and prices have recently been increased for all waste materials accepted at both CCS locations. These actions are expected to place additional pressure on the illegal dumping enforcement program.
McLennan (City of Waco)	578	431 tons. This includes 8671 tires and a total cleaned up of 837,300 pounds. The City and County cooperate to address the dumping problem and have been involved together in this effort for over nine years.
Falls		General information indicates that there are similar concerns regarding illegal dumping in Bosque and Falls Counties
Bosque		

McLennan County, outside of the City of Waco, also has successfully reduced illegal dumping cases to fewer than 20 per year and most of these are small in volume. This success is the result of many years of implementation of a very aggressive enforcement program. The county has recently reduced the amount of resources dedicated to illegal dumping as a result of this more than decade long effort to reduce and eliminate illegal dumping activity.

The current programs in place have been effective in removing large dump sites and reducing the incidence of dumping in the counties. However, illegal dumping is still occurring, and dump locations are being documented and cleaned up as they are discovered by individuals or officers. Based on our discussions with the Solid Waste Advisory Committee and the environmental control officers, the programs for addressing illegal dumping need to be continued or enhanced.

In 2004, John Ockels, Ph.D., formerly of the Texoma COG, developed a manual, "Local Control of Illegal Dumping", to assist local governments with illegal dumping. This manual is a valuable resource that is being used by local governments to develop and implement effective enforcement programs within cities and counties. Dr. Ockels also established the Texas Illegal Dumping Resource Center (TIDRC) to provide training and resources to local governments to fight illegal dumping in their jurisdictions.

The HOTCOG, in cooperation with TIDRC, has held training sessions for local officials in each of the counties to address updated laws and procedures for effective control of illegal dumping. Penalties associated with illegal dumping are summarized in Appendix C. The six county HOTCOG region has made significant improvements since the last update of regional solid waste plan by implementing effective enforcement and providing some limited facilities for collection of solid waste from individuals in unincorporated areas. However, in view of the continuation of illegal disposal practices and the related need to improve access to solid waste disposal services in certain areas of the region, it is clear that these enforcement programs need to continue.

Used and Scrap Tire Disposal

Scrap tires in the HOTCOG region are managed primarily by collection at various tire and auto services businesses within the region. These companies typically charge customers for collection and disposal of scrap tires. Fees for scrap tires are charged by the landfills for accepting scrap tires from residents or businesses. TCEQ maintains a scrap tire vendor database for companies that collect or handle scrap tires. Even though these programs are available for proper waste tire management, tire dumping remains an ongoing problem for counties and municipalities. County environmental officers indicated that they have identified several properties within their jurisdictions that have accumulated waste tires and have difficulty with cleanup once they become established due to the cost of disposal. Scrap tires are also collected periodically at amnesty events. HOTCOG recently conducted a series of tire amnesty events within the region in each of the six counties. Liberty Tire was contracted to provide the trailers to collect and remove scrap tires.

3.5.11 Siting a Waste Management Facility

As indicated in the section on Waste Disposal and Capacity, the existing landfills in the HOTCOG region have significant long-term capacity. The great majority of the long-term capacity is located in a privately owned landfill near the extreme northern border of the HOTCOG region. Transfer of collected waste from points of origin within the region would require a significant investment in either transfer station facilities or large capacity transfer truck-trailers not currently in operation in the region. This could potentially result in higher costs of solid waste collection. However, in consideration of the locations of the existing landfills and

the interest of the public sector in having capacity under its direct control, planning to increase the landfill capacity in the HOTCOG region is consistent with the RSWMP goal of Maximizing the Capacity and Efficiency of Landfills in the region. Siting and permitting a new waste management facility, such as a landfill or waste conversion facility, or expanding an existing landfill, can require many years. As such, in view of the duration and complexity of the permitting process and developing a new or expanded landfill, beginning the process of siting a landfill in the near future appears warranted in the near future.

Modern waste management facilities have many components. Depending on the area served and the overall waste management system, an integrated waste management facility may include the following components: landfill, wood waste management (which may include composting), maintenance facility, gatehouse and related access facilities, etc. Also, a landfill gas-to-energy plant should be reflected in the initial site layout, even though landfill gas control may not be required in the initial years of landfill operations. In addition, it may be appropriate to plan on co-locating a waste hauling operation and a materials recovery facility (MRF) at the same site. Siting a waste management facility generally entails a multi-stage process in consideration of many diverse selection criteria, including the following:

- Physical criteria
  - Geographic area (proximity to waste generation)
  - Access to transportation routes
  - Acreage – generally a minimum of 200 acres for an integrated waste management facility
  - Easements on property

- Cost considerations
  - Total cost of acquiring property
  - Cost per acre
  - Available property to acquire without requiring exercise of eminent domain
  - Support of the host community and/or county

- Environmental siting criteria and considerations
  - Floodplains and setback from streams
  - Wetlands
  - Depth to groundwater
  - Recharge zones of sole source aquifers
  - Fault zones
  - Seismic impact zones
  - Unstable areas
  - Habitat of rare and endangered species
  - Archaeological and historic resources
  - Setback from highways
  - Coastal zones (not applicable in HOTCOG region)

- Land Use Compatibility
  - Confirm absence of zoning restrictions
  - Confirm absence of other land use restrictions
  - Review nearby land use for compatibility issues
  - Proximity to residential areas
  - Proximity to schools, churches, parks, recreational areas

3.5.12 Closed Landfill Inventory

The inventory of closed municipal solid waste landfills in the region that was originally created by the TCEQ for the entire state in accordance with 363.064 of the health and safety code has been maintained and updated periodically by the HOTCOG. This inventory has been reviewed and updated again for this revision to the solid waste plan using the TCEQ central registry data base for closed municipal solid waste landfills. A summary of the closed landfills inventory for HOTCOG is included as Appendix E. This data will be reviewed and updated along with the next SWMP update.

3.5.13 Local Solid Waste Management Plans

Chapter 330, Subchapter O of the TCEQ's MSW regulations provides guidance for local plans as well as regional plans, such as the HOTCOG plan. There are currently no sub-regional or local solid waste management plans in place in the HOTCOG region. However, the City of Waco issued a request for qualifications (RFQ) for a 20-Year Solid Waste Master Plan Project. It is our understanding that the City plans to review submittals from qualified consultants and authorize this project within the next few months.

4 REGIONAL GOALS, OBJECTIVES AND ACTION PLAN

This section summarizes the HOTCOG region's solid waste concerns and recommends actions such as projects which address the identified problems. As required by the TCEQ, the Action Plan details short, medium, and long-range steps that all stakeholders in the HOTCOG can pursue. Stakeholders include volunteer organizations, business and commercial groups, waste haulers, waste disposal providers, and local, county, regional and state governments.

A comprehensive solid waste survey instrument was prepared by SCS (*2013 Solid Waste Survey*) and deployed by HOTCOG staff in order to gather data and information required for the development of this Plan. Surveys were sent to municipalities, counties, and private waste service providers in the HOTCOG region. After receipt of these surveys, HOTCOG and SCS followed up with the respondents to answer questions, and field work to gather additional data and information. In addition, SCS and HOTCOG staff provided encouragement to non-respondents to complete the survey to enhance the database addressed in the survey. This information was then used by SCS, HOTCOG staff, and the SWAC to assist in identifying critical needs and to identify the need for new goals, objectives, and new projects as a means of addressing these regional needs.

4.1 SUMMARY OF NEEDS AND PROBLEMS

According to the results of the *2013 Solid Waste Survey* (Appendix B), illegal dumping, improved collection programs, and increased opportunities for recycling were issues of major concern for the HOTCOG region. Other concerns identified in the course of the study included maximizing recycling and disposal facilities and enhancing public awareness of solid waste issues in the region. Many of these issues were previously identified in the 1992 Plan and various updates and were identified as goals by the SWAC.

4.1.1 Illegal Dumping/Open Burning Not Considered a Problem by Some Residents

While most residents in the HOTCOG region continue to manage their wastes in an environmentally-responsible manner, there continues to be a small group that continues to rely on illegal dumping and burning as a preferred method of waste disposal. There are various reasons for this behavior ranging from lack of convenient waste disposal locations in many rural areas to a lack of understanding that illegal dumping and open burning poses an environmental and safety threat to their neighbors. The poverty rate and related resource limitations is also believed to be a contributing factor.

4.1.2 Residents and Businesses Are Willing to Take Risks

Some residents and businesses in the HOTCOG region may be aware that dumping of solid waste is illegal, but are willing to risk illegal dumping because they perceive their chances of being caught are still relatively small. While the State has a number of "antidumping" statutes on the books and there are effective county environmental enforcement programs in the HOTCOG region, the reality is that is still *very difficult* to catch illegal dumpers.

4.1.3 Convenient and Affordable Options for Waste Disposal and Recycling

While there are a number of disposal locations in the HOTCOG region, which include citizens' collection centers and landfills, there are many cases where these facilities are inconvenient to rural residents and businesses because they are located at great distances where these residents and businesses are located. There may be a need to locate additional citizens' collection centers in the HOTCOG region to alleviate this problem. Cost of disposal is also a factor. Tipping fees and disposal fees at citizens' collection stations are potentially deterring their use by rural residents.

4.1.4 Streamlining Collection Options

The *HOTCOG 2013 Solid Waste Survey* showed that solid waste collection services are available throughout each county in the HOTCOG region. However, as the results showed, providing these services in a cost-effective manner is difficult for many solid waste providers, particularly in the rural areas due to issues such as inefficient routes, multiple haulers providing services in the same areas, and unpredictable receipts of customer billings. This is a typical solid waste management problem seen in rural areas with low population densities, and oftentimes results in making curbside collection too expensive. Communities across the U.S. have addressed this problem by taking a more coordinated approach to residential collection services in their unincorporated areas, either through standardized collection agreements, franchising, or mandatory collection.

4.1.5 Expanded Public Information/Education on Solid Waste Management

The City of Waco has extensive information regarding the City's multi-faceted solid waste management program available on its website. Furthermore, the City has an outreach program to enhance communications with residents and businesses. However, based on the results of the *2013 Solid Waste Survey*, in many of the communities – particularly in the unincorporated areas of the counties, it appears that while many residents and businesses may have access to collection, disposal, and recycling services, public information (web sites, community fact sheets or flyers, etc.) on these services appears not to be readily available. This suggests that many municipalities and counties may need to publicize the locations of these facilities or centers as well as access to collection with private waste haulers in the region.

4.2 GOALS AND OBJECTIVES

As approved by the TCEQ in 2007, the overall goals of the RSWMP are as follows:

Goal 1: Promote integrated solid waste management strategies as described in the Waste Management Hierarchy, which are appropriate for the HOTCOG region under state and federal priorities, which assure long-term disposal capacity.

Goal 2: Encourage public education and involvement on integrated solid waste management.

Goal 3: Encourage and promote funding availability to ensure regional and local implementation of this plan.

Goal 4: Encourage the development of household hazardous waste management and diversion programs.

Based on the results of the *HOTCOG 2013 Solid Waste Survey*, and the major needs and problems discussed in this updated plan, HOTCOG staff and the consulting team worked with the HOTCOG Solid Waste Advisory Committee (SWAC) to review these goals and the related objectives in the previous RSWMP, and to develop implementation strategies that reflect current conditions. The consulting team then worked with the SWAC to categorize these goals and related objectives into the three planning timeframes (a short-term five–year planning horizon, 2013 - 2017; an intermediate five-year planning horizon, 2018 - 2022; and a long-range 10-year planning period, 2023-2032) for accomplishing or implementing these goals. Exhibit 4-1 graphically presents a summary of the regional goals, objectives, and action plan of the RSWMP.

Exhibit 4-1 Plan Goals and Objectives Related to the Planning Horizon

GOALS	OBJECTIVES Short Term (1-5 Years)	Intermediate Term (6-10 Years)	Long-Term (11-20 Years)
1: Promote Integrated Solid Waste Management Strategies	Expand residential collection services to currently underserved areas Improve service to underserved areas through construction of new strategically located citizens' collection stations. Maximize capacity and efficiency of recycling operations Maximize capacity and efficiency of landfills	Continue to address underserved areas as warranted by needs and population growth of the HOTCOG region, e.g., expand citizens' collection stations, as needed Address recycling needs in response to changes in market dynamics of recycled commodities Address capacity issues, as warranted by current capacity of integrated waste management system (e.g., expand landfill(s)) Continue to monitor the development of waste-to-energy and waste conversion technologies and implement, when feasible	Encourage the development of transfer stations, as needed to address efficiencies of transporting MSW to disposal/processing facilities Continue to monitor the development of waste-to-energy and waste conversion technologies and implement when feasible
2: Encourage Public Education and Involvement in Integrated Solid Waste Management	Develop public education materials about solid waste management and recycling Increase public awareness of the importance of stopping illegal dumping Increase public awareness through clean-up events such as Waste Tire Amnesty Days Encourage community programs through school curricula, advertising campaigns, environmental programs, and volunteer organizations Encourage local efforts to stop illegal dumping Clarify local government responsibilities and encourage use of litter abatement officers with a vision of establishing a regional task force	In view of continuous evolution of the solid waste management system, continue to update the public on proper MSW management	In view of continuous evolution of the solid waste management system, continue to update the public on proper MSW management
3: Encourage and Promote Funding Availability to Ensure Regional and Local Implementation of this Plan	Utilize grant funds for local plans, illegal dumping enforcement, and development of collection stations Provide updates and distribution of the regional solid waste information system Promote and encourage grant and loan funds from federal, state, and private sector institutions to comply with the plan	Continue to monitor the availability of grants and pursue grant funding consistent with HOTCOG's goals	Continue to monitor the availability of grants and pursue grant funding consistent with HOTCOG's goals
4: Encourage the Development of HHW and Diversion Programs	Encourage public and private partnership efforts Support reduction of HHW	Assess the need, feasibility and public interest of a regional HHW collection facility(s) or mobile facility(s) Recommend the development and use of alternative non-HHW products	

4.3 ACTION PLAN

4.3.1 Projects and Programs

The following section discusses some of the many short-term projects or programs, which the SWAC plans on implementing as part of the RSWMP.

4.3.1.1 Waste Minimization, Reuse, and Recycling

Waste reduction, reuse, and recycling programs have been slow to begin in most of the region, with a few exceptions. Part of the problem has been continued low market prices during the recent recession to suppress the development of local recycling programs. With prices recently climbing, more analysis needs to be done to identify how smaller, rural communities in the HOTCOG region can enter the regional recyclables market. Further, there is limited curbside recycling programs in the region, other than provided in the Waco metro area and a few other communities, as well as recycling drop-off areas at the few citizens' collection centers.

In the short term, one possible answer would be for HOTCOG communities to partner with Cooperative Teamwork & Recycling Assistance (CTRA), which is a 501(c)(3) nonprofit organization based on the concept of cooperative marketing. Today, CTRA consists of 60 rural recycling cooperatives representing more than 500 public, private and nonprofit entities in Texas. The organization's mission is to provide cooperative marketing of recyclable commodities, to promote the development of end-markets for recyclables in Texas and to promote education about recycling.

CTRA provides technical assistance to communities or groups interested in recycling. It serves as their liaison between the public and private sector by negotiating contracts with haulers and end-market at competitive prices. The collection, transport and sale of recyclables, especially for smaller communities and remote areas, are coordinated by CTRA through their contractors. The CTRA also helps community recycling programs to effectively increase the amount and quality of collected recycled materials as well as maximize the efforts of those already recycling. Quality control at the cooperative level can impact the processor or the mill's willingness to negotiate contracts. CTRA charges no membership dues or fees; the only charge is a 10% administrative fee on all recyclable sales.

4.3.1.2 Collection

In order to reach the RSWMP's objective of expanding collection services to underserved areas in the region, the Action Plan supports two projects or programs for solid waste collection in the short term planning period.

4.3.1.2.1 Develop Standardized Collection Bid Documents

As the *2013 Solid Waste Survey* indicated, many communities or community organizations, such as homeowners associations, desperately need assistance in helping implement viable and cost-effective waste collection programs. To assist this effort, HOTCOG and the HOTCOG counties may want to consider supporting a project with the objective of developing standardized solid waste collection bid documents or franchise agreements, which can then be utilized to provide valuable guidance in solid waste collection procurements. Furthermore, programs should be

developed to educate residents, businesses, construction companies, property owners, governmental institutions, and businesses on waste collection practices through providing information on the HOTCOG website and periodic training classes and brochures.

4.3.1.2.2 Develop a Model Design for a Rural Citizens' Collection Stations

The SWMP also recommends the implementation of a program to be developed in the short-term planning period, which would be designed to provide standardized designs and siting criteria for citizens' collection centers. The objective of this project would be to develop a "model design" for citizens' collection station, which would address key functionality issues (e.g., site layout, fencing and security, signage, utilities, placement of the collection dumpsters and recycling collection containers, waste transfer, etc.) as well as providing guidance on operational needs and costs. The development of a standardized Pro Forma economic model would prove to be most useful for local governments in evaluating the construction and operational costs for these facilities, grant funding offsets, and cost of service.

4.3.1.3 Reduce Illegal Dumping

In order to reach the RSWMP's objective of minimizing illegal dumping in the region, the Action Plan supports projects or programs for solid waste collection in the short-term planning period.

4.3.1.3.1 Continued Regional Training

HOTCOG has utilized TCEQ grant funds to provide training opportunities on illegal dumping issues for law enforcement, prosecutors, judges, policy makers, and interested citizens that provide professional continuing education credits and meets state certification programs. The RSWMP recommends that these valuable training programs continue in the short-term planning period.

4.3.1.3.2 Continued Support of the Illegal Dumping Enforcement Programs

As discussed in Section 3 of this report, illegal dumping remains a notable concern in the HOTCOG region. As such, the programs involving the environmental control officers, who routinely address illegal dumping incidents, need to be continued and enhanced, as funds are made available.

4.3.1.3.3 Develop Public Educational Materials

Informing the public of the costs and health concerns associated with environmental crimes and illegal dumping helps to draw increased attention to this regional problem. The RSWMP will support a short-term project to develop a media kit on illegal dumping, including a "Stopping Illegal Dumping" website, develop HOTCOG-specific messages such as slogans and emblems, signs, and brochures, and publicizing successes in stopping illegal dumping in stopping illegal dumping. It is understood that the development of such educational materials will be addressed on a prioritized basis with other programs and that such programs will not result in an increase in litter.

4.3.1.4 Waste-to-Energy and Waste Conversion

Waste-to-energy and waste conversion continues to be studied by local governments throughout the country as a means to potentially expand long-term waste disposal capacity. Appendix F provides a brief overview of waste-to-energy and waste conversion.

Producing and utilizing energy from the combustion of solid waste is a concept which has been practiced in Europe since the turn of the last century. Prompted by a concern for groundwater quality and the scarcity of land for 1andfilling, many European countries and Japan embarked on massive construction programs for waste-to- energy (WTE) programs in the 1960's. Transfer of this technology to the United States first began in the late 1960's and early 1970's. In addition, many other projects utilizing American technology in the area of shredded and prepared fuels were constructed. Most of these projects were problematic, however, because they were unable to overcome materials handling and boiler operations problems. It was these failures that made local government leaders initially cautious in funding construction of WTE projects.

Nevertheless, several WTE projects were developed in the mid to late 1970's in communities such as Saugus, Massachusetts; Pinellas County, Florida; and Ames, Iowa which were experiencing severe landfill problems. Success of these projects helped the WTE industry gain acceptance by local government leaders, and the financial community. Tax incentives made available by the federal government for WTE projects attracted private capital investment in such projects assisting in the maturing of this industry in the United States and sparked the development of many new projects. Over the 1980s and 1990s, there were nearly 100 WTE plants constructed in the United States, primarily in regions with high landfill tipping fees, difficulties with landfill siting, and high resale rates for electricity or steam.

As of the writing of the RSWMP, there are about 1,300 WTE facilities worldwide which are estimated to provide almost 600,000 metric tons per day of disposal capacity. Large numbers are located in Europe (440), primarily because of the European Union's (EU) directive that requires a 65% reduction in the landfilling of biodegradable MSW. Given the EU's directive on landfilling, estimates of new WTE facility construction range from 60 to 80 new plants by 2020. Scandinavian counties (Denmark and Sweden) are significant proponents of WTE.

Asian countries (Japan, Taiwan, Singapore, and China) have the largest number (764) of WTE facilities worldwide. All of these countries face limited open space issues for the siting of landfills and high urban populations. For example, Japan has addressed its solid waste issue by processing about an estimated 70 percent of MSW in WTE facilities.

In the United States, there has been a downturn in WTE plant construction since the early 1990s due to the high costs for plant construction, difficulties in siting, and competition from landfill operators offering low tipping fees. Until last year, no new WTE plant was constructed in North America since 1992. Then, last year, construction was announced on a new $650 million WTE plant for Palm Beach County, Florida, and three large WTE plants in Canada, one in Ontario, Alberta, and British Columbia.

Given the rising cost of power and fuel in recent years, there has been an increase in developers proposing a "new" type of solid waste disposal facility, one that is based on "waste conversion"

technology. Waste conversion has become synonymous with technologies that employ thermal-chemical, bio-chemical or hybrid processes to convert waste into energy. They have become popular because of the combination of several factors; the perception that conventional WTE plants and landfills are problematic from an air emissions health perspective, the desire for sustainable new sources of energy with fewer emissions, and the demand for plants that can produce usable by-products.

In the past, the issue of WTE has been addressed in previous RSWMPs with support for continued research and development in this area. Recently, the City of Waco issued an RFP to developers of waste conversion technologies. The City is continuing on that process with the objective of identifying the costs and potential revenues from a waste conversion project. Should these efforts prove fruitful, other communities in the HOTCOG region may have an opportunity to participate in this project.

4.3.1.5 Household Hazardous Waste

The RSWMP continues to support the development of household hazardous waste collection and diversion programs through the entire 20-year planning period. Historically, HOTCOG communities have encouraged this goal through sponsorship of periodic cleanup events or working with local landfill operators and private organizations. Household hazardous waste collection programs are rapidly evolving in the United States. Many communities are finding that mobile collection facilities are more cost effective than the development of permanent collection centers. Some communities are even experimenting with curbside collection of these materials. Time will tell if these programs become cost-effective for implementation for rural areas existing in HOTCOG. Consistent with the Subtitle D rules, landfills in the region have been designed with composite liners which provide for the management of household hazardous waste without environmental impact. Such environmental protection is a valid consideration in assessing the need for separate facilities for the management of household hazardous waste. In view of competing demands for resources for enhancements to the solid waste management system, the SWMP recommends that the need for mobile or permanent centers be evaluated in future SWMP updates.

4.3.2 Plan Conformance and Permit Review

As the State's designated planning agency, HOTCOG is responsible for reviewing municipal solid waste management facility permit applications for the region. The SWAC reviews applications submitted to TCEQ for conformance to the Plan, required under 363.066 of the Texas Health and Safety Code and the TCEQ rules (30 TAC Chapter 330, Subchapter O). The Committee's findings will be submitted to the TCEQ for consideration when the TCEQ decides whether or not to grant the permit or registration request. Consistent with the role of TCEQ permitting procedures, as defined in 30 TAC Chapter 330, Subchapter B, Permit and Registration Application Procedures, the implementation and role of HOTCOGs in the permitting process is as follows:

- HOTCOGs will review Parts I and II of the application to verify the accuracy of the information provided and assess the consistency of the proposed project with the overall goals of the RSWMP.

- The SWAC will meet to discuss the proposed facility plans.
- The applicant will be provided with an opportunity to meet with the SWAC and HOTCOG to make a presentation regarding its proposed project, particularly with regard to its consistency with the RSWMP.
- HOTCOG will submit a letter of conformance or of non-conformance along with the list of considerations in support of its decision to the MSW Permits Section, TCEQ, for review and insertion in the Commission backup material for agenda.
- The TCEQ directs that "a lack or need for, a particular facility should not be a factor in the plan conformance review."
- As noted in 30 TAC 330.61(p), plan conformance review letters from the COGs are not prerequisites to a final determination on a permit or a registration application.

4.3.2.1 Voluntary Pre-Application Review

A potential permit or registration applicant may request to meet with HOTCOG staff to discuss the conformance factors of the permitting process. The Plan conformance and review process will be explained to the applicant, who will be advised of the current HOTCOG review process, including a current plan conformance checklist, as available.

4.3.2.2 Preliminary Review

It is the applicant's responsibility to demonstrate conformance with the RSWMP. A request for review of a registration or permit application will be accomplished by submitting the following information to HOTCOG:

- A copy of Parts I and II of the permit application forms.
- A copy of the current SWMP Conformance Checklist, as available.
- A cover letter identifying the facility type and providing contact information for: the applicant, and the applicant's engineer.
- A map illustrating the location of the proposed or existing facility.

The request and submission of documents for review shall be submitted or delivered to:

Heart of Texas Council of Governments
Attn: Environmental Development Planner
1514 South New Road
Waco, Texas 76711

4.3.3 Grant Funding Plan

The Regional Solid Waste Grants Program Funding Plan outlines the following items: RSWMP priorities, project categories, allocation and priorities and the project section process. The RSWMP project priorities consist of the four goals of the RSWMP:

- Coordination of integrated solid waste management strategies, as described in the waste management hierarchy, which are appropriate for the HOTCOG region, which assure long-term disposal capacity.
- Provide for public education and involvement on integrated solid waste management.
- Encourage and promote funding availability to ensure regional and local implementation of the RSWMP.
- Encourage the development of recycling and diversion programs.

Through the use of TCEQ grants funds, various cities and counties in the HOTCOG region have been able of implement the following projects and programs over the past 20 years:

- Illegal dumping training/education program – This has involved the use of a statewide trainer to offer classes to citizens, agencies and Litter Prevention Officers.
- Development and implementation of countywide Litter Abatement Programs.
- Purchase of brush chippers.

4.3.3.1 Regional Solid Waste Management Plan Priorities

The SWAC for the HOTCOG region has determined the following funding priorities for the eligible project categories for this grants program as per TCEQ guidelines. There are no maximum funding limits for any category. However, the project award funding minimum that can be requested is $5,000.

4.3.3.1.1 Funding Category 1: Local Enforcement

These are projects which contribute to the prevention of illegal dumping of municipal solid waste, including liquid waste. These projects may include programs that investigate illegal dumping problems, educate the public on illegal dumping laws, and prosecute violators.

4.3.3.1.2 Funding Category 2: Litter and Illegal Dumping

Funded activities may include: waste removal; disposal or recycling of removed materials; fencing and barriers; and signage. Placement of trash collection receptacles in public areas with chronic littering problems may also be funded. Reuse or recycling options should be considered for managing the materials cleaned up under this program, to the extent feasible. Funds may also be used for periodic community collection events, held not more frequently than twice per year, to provide for collection of residential waste materials for which there is not a readily-available collection alternative, such as large and bulky items that are not picked up under the regular collection system.

4.3.3.1.3 Funding Category 3: Local Solid Waste Management Plans

Projects funded under this category include activities to develop or amend a local solid waste management plan and have it adopted by the TCEQ, in accordance with Subchapter D, Chapter 363, Texas Health and Safety Code, as implemented by TCEQ rule, 30 TAC Chapter 330, Subchapter O.

4.3.3.1.4 Funding Category 4: Citizens' Collection Stations, "Small" Registered Transfer Stations and Community Collection Events

This category includes projects to construct MSW collection facilities in areas that are underserved by collection services or lack public access to proper disposal facilities. Projects funded under this category includes citizens' collection stations, as these facilities are defined under the TCEQ's MSW regulations (30 TAC Chapter 330.3(20). These stations may consist of one or more storage containers, bins, or trailers." As stated in 330.11(e)(1), the TCEQ requires a notification for citizens' collection stations. In view of the need for CCCs at various locations in the HOTCOG region, a cost-effective approach to implementing CCCs may entail developing a standardized design and bid document package that could be readily adapted to specific locations across the region.

4.3.3.1.5 Funding Category 5: Hazardous Household Waste Management

This category includes projects that provide a means for the collection, recycling, reuse, or proper disposal of household hazardous waste, including home chemicals and other materials. This category may also include events conducted under TCEQ's Texas County Cleanup Program. Projects may include periodic collection events, consolidation and transportation of collected materials, recycling and reuse of materials, proper disposal of materials, and education and public awareness programs.

4.3.3.1.6 Funding Category 6: Technical Studies

This category includes projects for the collection of pertinent data, analysis of issues and needs, evaluation of alternative solutions, and identification of recommended actions to assist in making solid waste management decisions at the local or regional level. Projects under this category may also include research and investigations to determine the location, boundaries, and contents of closed old and abandoned MSW landfills, and to assess the possible risks to human health or the environment associated with those landfill or sites.

4.3.3.1.7 Funding Category 7: Education and Training Projects

This category is intended for educational projects or training events dealing with a variety of solid waste management topics, but with a particular focus on the following:

- Environmental and public health concerns and costs of illegal dumping.
- Benefits of recycling and waste diversion.
- The need for a comprehensive approach to addressing waste management issues, which includes waste reduction, recycling, waste collection, and proper management of the remainder of the waste stream in permitted landfills.

4.3.3.2 Allocation Priorities and the Project Selection Process

An open competitive process will be used to request projects for targeted funds available from TCEQ. Each project funding cycle will be advertised in local newspapers, and direct mail notices sent to all eligible entities in the HOTCOG region. The SWMP will be utilized as a basis for selecting and funding implementation projects. Also the "Request for Projects" and project applications will be available on the HOTCOG Internet Web site. Notification will be sent to all known private sector contacts. HOTCOG staff will provide all administrative support for logging, sorting, batching, and processing all project applications.

The SWMP establishes the priorities for funding by HOTCOG for implementation projects, and such projects must be consistent with the SWMP. The SWMP includes strategic goals, with key objectives, and the actions recommended to accomplish these directives. For each funding cycle, the project selection process will begin with the completion of a full project application by an applicant, along with a resolution from the local government entity.

4.3.3.2.1.1 Screening

HOTCOG staff, working with the SWAC will screen applications for completeness, and that all application requirements and procedures have been followed. Proposed projects must conform to eligible category standards, eligible recipient standards, and allowable expense and funding standards, under all applicable laws and regulations. The applicant must agree to document the results of the project as required by HOTCOG. The proposed project must be technically feasible, and there must be a reasonable expectation that the project can be satisfactorily completed within the required time frames. The proposed project activities and expenses must be reasonable and necessary to accomplish the goals and objectives of the project. One factor in determining reasonableness of expenses will be whether comparable costs are proposed for comparable goods and services. Proposed projects must be consistent with applicable goals, objectives, and recommendations of the RSWMP.

4.3.3.2.1.2 Scoring

HOTCOG staff will then log, sort, batch applicant packets and prepare an individualized score sheet for each SWAC member. Conflict of interest situations will be taken into consideration. Each SWAC member will individually review each project application, using his or her best professional judgment. SWAC members may seek further clarification on specific projects by forwarding requests through HOTCOG staff during the comment period. Staff will then seek responses from local government entities as well as any comments received from the public review process and compile these for SWAC reference. Finally, SWAC members will independently score each application, subject to the conflict of interest provisions. Scores will be forwarded to the HOTCOG staff for compilation. The highest and lowest scores received for each application will be dropped, and the remaining scores averaged.

4.3.3.2.1.3 Ranking

All eligible applications are then placed into descending ranked order by HOTCOG staff. Projects will all be ranked into a single list. The SWAC members will be asked a "yes/no" question on whether the application should be funded. These will be compiled and serve as the first tiebreaker for applications with identical scores. Any ranked projects without a majority of "yes" responses will require negotiation and resubmission to the SWAC for approval.

SWAC members will convene for a special meeting to review the rank order results for the funding cycle. Total available funds will be awarded to the top-ranked projects until all funds are allocated. Unallocated funds will be carried over into the next funding cycle. The rankings and allocations will then be recommended to the HOTCOG Executive Board for approval.

The process will be repeated beginning with each planning cycle.

4.3.4 Local Solid Waste Management Plans

There are no local solid waste management plans currently in place in the HOTCOG region. It is the responsibility of HOTCOG to ensure that local solid waste management plans will follow the guidelines listed in Chapter 330, Subchapter O: *Regional and Local Solid Waste Management planning and Financial Assistance General Provisions,* to receive grant funding. TCEQ rules (30 TAC §330.641(a)) provide that local governments coordinate with the appropriate council of governments and ensure that a local plan is consistent with any regional solid waste management plan in effect for the region, if a regional plan has been approved by TCEQ.

4.3.5 Regional Coordination and Planning

HOTCOG is the designated regional solid waste management planning agency for the HOTCOG planning region, and the State of Texas has set specific goals and objectives for municipal solid waste management. As such, HOTCOG administers a regional solid waste coordination, planning, and implementation program under the TCEQ. These coordination and planning activities include: maintaining the RSWMP; maintaining a solid waste advisory committee (SWAC); providing technical assistance and informational programs pertaining to solid waste management; serving as a central point of contact for solid waste management outreach, education, and training programs; and reviewing permit and registration applications for municipal solid waste facilities in conformance to the RSWMP.

HOTCOG also conducts solid waste management data collection efforts and analyses to maintain current data and information concerning the status of municipal solid waste management activities in the six-county HOTCOG region.

4.4 REFERENCES

1. City and County Websites
2. Greater Waco Chamber of Commerce, *Waco At A Glance*, June 2013.
3. Heart of Texas Economic Development District, *Heart of Texas Economic Development Strategy*, May 15, 2013.
4. HOTCOG, *Heart of Texas Regional Solid Waste Management Plan 1991-2010*, March 2007.
5. HOTCOG, *Heart of Texas Regional Solid Waste Management Plan 1991-2010,* Update 23 March 2000.
6. HOTCOG, *Heart of Texas Regional Solid Waste Management Plan 1992*, May 1992.
7. Illich, Paul, *HOTCOG P-20 Service Area Profile*, Presentation before the Greater Waco Community Education Alliance, September 19, 2012.
8. North Central Texas Council of Government, *Rural and Underserved Area Disposal Needs Study,* August 2003.
9. Rogoff, Marc, *Waste-to-Energy Technologies and Project Implementation*, Elsevier, London, 2012.
10. Rogoff, Marc J., et. al, *Solid Waste Rate Setting and Financing Guide: Analyzing Cost off Services and Designing Rates for Solid Waste Agencies*, American Public Works Association, Kansas City, 2007.
11. SCS Engineers, *Solid Waste Consulting Services for Updating the HOTCOG Regional Solid Waste Plan*, Status Report, August 8, 2013.
12. SCS Engineers, *Heart of Texas Solid Waste Management Plan for the Heart of Texas Region*, Presentation for the SWAC, HOTCOG, August 7, 2013.
13. SCS Engineers, *2013 Solid Waste Surveys*, Prepared for the Heart of Texas Council of Governments, August 2013.
14. SCS Engineers, *Recycling and Solid Waste Management Plan for the Borough of Skagway, Alaska*, Prepared for the Borough of Skagway, Alaska, April 2013.
15. Texas Commission on Environmental Quality, *Municipal Solid Waste in Texas: A Year in Review, FY 2011 Data Summary and Analysis,* AS-187/12, Revised November 2012.
16. Texas Commission on Environmental Quality, *Municipal Solid Waste in Texas: A Year in Review, FY 2012 Data Summary and Analysis,* AS-187/13, October 2013.
17. Texas Illegal Dumping Resource Center, www.tidrc.com, John H. Ockles, Ph.D., Director
18. Texas State Data Center, http://txsdc.utsa.edu/Data/TPEPP/Estimates/Index.aspx, Accessed August 19, 2013.
19. Texas State Data Center, *Projections of the Population of Texas and Counties in Texas by Age, Sex, and Race/Ethnicity for 2010-2050*, November 2012.
20. U.S. Bureau of the Census, *American Community Survey*, 2010.
21. Site-specific annual reports for the four landfills located in the HOTCOG region as provided by TCEQ
22. Marc J. Rogoff, *Solid Waste Recycling and Processing, Planning of Solid Waste Recycling Facilities and Programs*, 2nd Edition, William Andrew/Elsevier, 2013.
23. SWANA Applied Research Foundation, "The Long-Term Environmental Risks of Subtitle D Landfills", June 2011.

24. SWANA Applied Research Foundation, "The Long-Term Management and Care of Closed Subtitle D Landfills", December 2010.
25. US Environmental Protection Agency. Municipal Solid Waste Generation, Recycling and Disposal in the United States: facts and figures for 2010, < http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw_2010_rev_factsheet.pdf > ; 2011.
26. Los Angeles County Solid Waste Committee/Integrated Waste Management Committee. Task Force Adopts Key Definitions And New Solid Waste Paradigm, MSW Management, October 31, 2012
27. MacKerron C. Unfinished business: the Case for Extended Producer Responsibility for Post-Consumer Packaging, As You Sow; 2012.
28. SAIC. Evaluation of Extended Producer Responsibility for Consumer Packaging, Produced for the Grocery Manufacturers Association; 2012.
29. EUROPEN. Packaging and Packaging Waste Statistics in Europe: 1998–2008, the European Organization For Packaging And The Environment; 2011.
30. US Environmental Protection Agency, <http://www.epa.gov/epawaste/conserve/tools/cpg/index.htm>.
31. INFORM. Greening Garbage: Trends in Alternative Fuel Use, 2002–2005, New York; 2005.
32. Kessler Consulting, Inc. Materials Recovery Facility Technology Review, Prepared for Pinellas County Department of Solid Waste Operations; 2009.
33. Ross D. Rolling out single stream, resource recycling; 2013. p. 18–26.
34. Carroll J. New York City Plans Apartment E-Waste Collection, Waste And Recycling News; 2013.
35. SWANA Applied Research Foundation. Options for Recycling Source-Separated Organics, Solid Waste Association of North America; 2012.
36. Yepsen R. Residential Food Waste Collection In The US Biocycle; 2012.
37. SWANA Applied Research Foundation. Collection of Organic Wastes from High-Rise Buildings and Apartment Complexes, Solid Waste Association of North America; 2012.
38. Cal Recycle. Food Waste Recovery: A Model for Local Government Recycling and Waste Reduction; 2010.

APPENDICES

Appendix A
HOTCOG Solid Waste Advisory Committee

HEART OF TEXAS COUNCIL OF GOVERNMENTS
REGIONAL SOLID WASTE ADVISORY COMMITTEE

Bosque County	
James Finley	Environmental Crime
Kent Harbison	County Commissioner
Debbie Tolman	Ph., D. Environmental Science

Freestone County	
Bill Madding	Environmental Crime
Nicole Crawford	Fairfield ISD

Limestone County	
James Maxey	Environmental Crimes

Hill County	
John Miller (Chair 2012-2013)	Environmental Crimes
Susan Haney	Corps of Engineers

Falls County	
James Maxey	Environmental Crime, Constable

McLennan County	
Chuck Dowdell	City of Waco Solid Waste Services
Natalie Edwards	City of Wooodway
Shirley Blanton	Concerned Citizen
Rob Thomas	Master Naturalist
Anna Dunbar	City of Waco Solid Waste Services

Falls County	

Private Services	
Trey Buzbee	Brazos River Authority
Gregg Hill	CMC Recycling
Tim Henderson	Progressive Waste Solutions

Non-Profit/Educational	
Leonard Englander (Vchair)	Keep Waco Beautiful (KWB)
Sherri Street	Keep Waco Beautiful (KWB)
Rob Thomas	Master Naturalist/Composter

Ex-Officio	
Ms. Polly Porter	TCEQ - Waco

members of RSWMP Subcommittee

By-Laws state a minimum of 19, max of 27
1/3 of members be present for a quorum

Appendix B
2013 Waste Survey Results

County	City	Collection					Recycling		Yardwaste			Underserved Areas		Illegal Dumps	Comment	Website Information Available
		Service	Frequency (per week)	Cost (monthly)	Public/Private	Name of Provider	Service	Location of Recycling Drop-off Center	Service	Frequency	Location	Y/N	Comment	Y/N	Y/N	
Bosque	Clifton	Curbside	2	$ 15.01	Private	-	Paper Only	GreenFibre Locations 614 S Ave G, 900 FM 3220, 1800 W 9th ST.	Drop-off	1/month	-		N	-	N	Y
	Merdian	Curbside	1	$ 13.00	Private	IESI (Progressive)	Drop-off	Bosque County Recycling Center	Drop-off	-	315 W. River, Meridian	Y	Y	N	N	Y
	Cransfills Gap	Curbside	1	$ 15.34	Private	Progressive	None		None	-	-	-	N	N	N	N
	Iredell	-	-	-	Private	IMC	-	-	-	-	-	-	N	N	N	N
Falls	Golinda	Curbside	1	$ 22.65	Private	TES	None	-	None	-	-	-	N	N	N	N
	Rosebud	Curbside	1	$ 16.69	Private	Progressive	None		Drop-off		Stallworth Street	N	N	N	N	Y
	Marlin	Curbside	2	$ 14.70	Private	Progressive	None		Curbside	1/month		N		N		
	Lott	Curbside	1	$ 12.41	Private	Progressive	Drop-off	Volunteer Fire department collects cans at 313 E. Gassaway	Curbside	-	-	-	-	N	-	N
Freestone	Fairfield	Curbside	1		Private	Progressive	Drop-off	Fairfield HS - Post Oak Rd	Drop-off		300 Cotton St	N	N	N	N	N
	Streetman	Drop-off	n/a	$ 10.00	Other	Paid by Freestone Co.	Drop-off	Streetman Transfer Point	-	-	-	N	N	N	N	N
Hill	Blum	Curbside	1	$ 15.55	Private	Progressive	-	-	-	-	-	-	N	N	N	N
	Mount Calm	Curbside	1	$ 11.96	Private	Republic	None	-	-	-	-	-	N	N	N	N
	Hubbard	Curbside	1	$ 16.93	Private	-	None	-	None	-	-	Y	N	Y	Y	N
	Bynum	Curbside	1	$ 15.90	Private	Republic	None	-	Curbside	-	-	N	N	N	N	N
	Hillsboro	Curbside	1	$ 13.68	Private	Republic	Curbside		Curbside	1/month		N	N	N	N	Y
	Whitney	Curbside	1	$ 10.21	Private	Republic	None	-	Curbside	1/month	-	-	N	N	N	N
Limestone	Mexia	Curbside	2	$ 13.00	Private	Allied (Republic)	-	-	-	-	-	-	N	-	N	N
	Coolidge	Curbside	1	-	Private	Allied (Republic)	None	-	None	-	-	-	N	N	N	N
	Groesbeck	Curbside	1	-	Private	Progressive	-	Groesbeck Recycling Center, 309 N. Rusk St, Groesbeck, Texas 76642	Curbside	1	-	-	N	N	N	Y
	Tehuacana	Curbside	1	$ 12.00	Private	-	None	-	None	-	-	-	N	N	Y	N
	Thornton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N
McLennan	Bellmead	Curbside	2	$ 12.00	Private	Waste Mgt.	-	-	-	-	-	-	N	N	N	N
	Beverly Hills	Curbside	2	$ 17.50	Private	Waste Mgt.	None	-	-	-	-	-	N	N	N	Y
	Bruceville-Eddy	Curbside	1	$ 14.30	Private	Progressive	None		None					Y	Y	
	Hewitt	Curbside	1	-	Private	Allied (Republic)	Curbside	-	Drop-off	1week/month	750 Ritchie Rd.	-	-	-	-	Y
	Lacy Lakeview	Curbside	2	$ 12.98	Private	Waste Mgt.	Curbside	-	None	-	-	-	N	N	N	N
	Leroy	Curbside	1	$ 14.74	Private	Progressive	None	-	None	-	-	-	N	N	N	N
	Lorena	Curbside	1	$ 17.50	Private	Waste Mgt.	Curbside	-	Drop-off	2/week + 1/month	708 S Front Street	N	N	N	N	N
	McGregor	Curbside	2	$ 16.77	Private	Progressive	Drop-off	Jefferson and 3rd	Curbside	1/month	-	-	N	N	N	Y
	Valley Mills	Curbside	2	$ 14.28	Private	Waste Mgt.	None	-	Curbside	1/year	-	None	N	N	N	N
	Waco	Curbside	1	$ 14.20	Public	-	Curbside & Drop-off	Cobbs Recycling Center	Curbside	1/2weeks	Cobbs Recycling Center	N	N	Y	N	Y
	Mart	Curbside	1	$ 17.34	Private	-	None		Drop-off	-	Dumpster at City Hall	N	N	Y	N	N
	Woodway	Curbside	2	$ 16.00	Private	Progressive	Curbside	-	Curbside	1/week	-	-	N	Y	Y	Y

Appendix C
Resource Materials on Illegal Dumping Enforcement
Provided Courtesy of Texas Illegal Dumping Resource Center

1. Criminal Health Nuisance Violations

ENFORCEMENT OPTIONS

(a) Municipal code enforcement	**Local Code Enforcement Officers**
(b) Administrative rule violations	TCEQ staff
(c) Criminal law violations	**Local law enforcement;** TCEQ Special Investigations; Other state agencies
(d) Civil enforcement	Attorney General (TECQ support); **Local government** (TWC 7.351)

Texas Health & Safety Code Chap 341 Minimum Standards of Sanitation and Health Protection Measures

Application: Everywhere

Use this criminal law to address health issues throughout Texas, both inside cities and in unincorporated areas. Every day is a separate violation.

General Nuisance Violations

Sec 341.011. NUISANCE. Each of the following is a public health nuisance:

(1) a condition or place that is a breeding place for flies and that is in a populous area;

(4) a place, condition, or building controlled or operated by a state or local government agency that is not maintained in a sanitary condition;

(5) sewage, human excreta, wastewater, garbage, or other organic wastes deposited, stored, discharged, or exposed in such a way as to be a potential instrument or medium in disease transmission to a person or between persons;

(6) a vehicle or container that is used to transport garbage, human excreta, or other organic material and that is defective and allows leakage or spilling of contents;

(7) a collection of water in which mosquitoes are breeding in the limits of a municipality or a collection of water that is a breeding area for Culex quinquefasciatus mosquitoes that can transmit diseases regardless of the collection's location other than a location or property where activities meeting the definition of Section 11.002(12)(A), Water Code, occur;

(9) a place or condition harboring rats in a populous area;

(11) the maintenance of an open surface privy or an overflowing septic tank so that the contents may be accessible to flies; and

(12) an object, place, or condition that is a possible and probable medium of disease transmission to or between humans.

Note: If the above conditions exist, see Sec. 341.012 for the required abatement process, which involves actions by local health authorities and prosecutors. The time to abate is set by the local health authority and depends on the situation.

Specific Violations: Trash

THSC Sec. 341.013. GARBAGE, REFUSE, AND OTHER WASTE.

(a) Premises occupied or used as residences or for business or pleasure shall be kept in a sanitary condition.

(b) Kitchen waste, laundry waste, or sewage may not be allowed to accumulate in, discharge into, or flow into a public place, gutter, street, or highway.

(c) Waste products, offal, polluting material, spent chemicals, liquors, brines, garbage, rubbish, refuse, used tires, or other waste of any kind may not be stored, deposited, or disposed of in a manner that may cause the pollution of the surrounding land, the contamination of groundwater or surface water, or the breeding of insects or rodents.

(d) A person using or permitting the use of land as a public dump shall provide for the covering or incineration of all animal or vegetable matter deposited on the land and for the disposition of other waste materials and rubbish to eliminate the possibility that those materials and rubbish might be a breeding place for insects or rodents.

(e) A person may not permit vacant or abandoned property owned or controlled by the person to be in a condition that will create a public health nuisance or other condition prejudicial to the public health.

Specific Violations: Sewage

From THSC Sec. 341.014. DISPOSAL OF HUMAN EXCRETA.

(a) Human excreta in a populous area shall be disposed of through properly managed sewers, treatment tanks, chemical toilets, or privies constructed and maintained in conformity with the department's specifications, or by other methods approved by the department. The disposal system shall be sufficient to prevent the pollution of surface soil, the contamination of a drinking water supply, the infection of flies or cockroaches, or the creation of any other public health nuisance.

THSC Sec. 341 Penalties

From THSC Sec. 341.091 CRIMINAL PENALTIES

First Violation

An offense under this section is a misdemeanor punishable by a fine of not less than $10 or more than $200.

Subsequent Conviction Within 1 Year

If it is shown on the trial of the defendant that the defendant has been convicted of an offense under this chapter within a year before the date on which the offense being tried occurred, the defendant shall be punished by a fine of not less than $10 or more than $1,000, confinement in jail for not more than 30 days, or both.

Provided courtesy of the
Texas Illegal Dumping Resource Center
tidrc.com

Texas Health & Safety Code Chap 343 Abatement of Public Nuisances

Application: Unincorporated Areas Only

Use this criminal law to address health issues in unincorporated areas of Texas. Every day is a separate violation. Does not apply to land classified on tax rolls as agricultural or a site having a permit/license by a state agency.

Specific Violations: Trash

From THSC Sec. 343.011. PUBLIC NUISANCE.

(a) This section applies only to the unincorporated area of a county.

(b) A person may not cause, permit, or allow a public nuisance under this section.

(c) A public nuisance is:

(1) keeping, storing, or accumulating refuse on premises in a neighborhood unless the refuse is entirely contained in a closed receptacle;

(2) keeping, storing, or accumulating rubbish, including newspapers, abandoned vehicles, refrigerators, stoves, furniture, tires, and cans, on premises in a neighborhood or within 300 feet of a public street for 10 days or more, unless the rubbish or object is completely enclosed in a building or is not visible from a public street;

(3) maintaining premises in a manner that creates an unsanitary condition likely to attract or harbor mosquitoes, rodents, vermin, or disease-carrying pests;

(4) allowing weeds to grow on premises in a neighborhood if the weeds are located within 300 feet of another residence or commercial establishment;

(5) maintaining a building in a manner that is structurally unsafe or constitutes a hazard to safety, health, or public welfare because of inadequate maintenance, unsanitary conditions, dilapidation, obsolescence, disaster, damage, or abandonment or because it constitutes a fire hazard;

(12) discarding refuse on property that is not authorized for that activity.

Read the other nuisances defined there, too!

THSC Sec. 343 Penalties

From THSC Sec. 343.012. CRIMINAL PENALTY

First Violation

An offense under this section is a misdemeanor punishable by a fine of not less than $50 or more than $200.

Subsequent Conviction Ever

Punishable by a fine of not less than $200 or more than $1,000, and/or confinement in jail for not more than six months.

2. Illegal Dumping Onto Land or Into Water

Texas Health & Safety Code Chap 365
Litter Abatement Act

Key Definitions

From Section 365.011

"Approved solid waste site" means:
(A) a solid waste site permitted or registered by the Texas Natural Resource Conservation Commission;
(B) a solid waste site licensed by a county under Chapter 361; or
(C) a designated collection area for ultimate disposal at a permitted or licensed municipal solid waste site.

"Commercial purpose" means the purpose of economic gain.

"Commercial vehicle" means a vehicle that is operated by a person for a commercial purpose or that is owned by a business or commercial enterprise.

"Dispose" and **"dump"** mean to discharge, deposit, inject, spill, leak, or place litter on or into land or water.

"Litter" means:
(A) decayable waste from a public or private establishment, residence, or restaurant, including animal and vegetable waste material from a market or storage facility handling or storing produce or other food products, or the handling, preparation, cooking, or consumption of food, but not including sewage, body wastes, or industrial by-products; or
(B) nondecayable solid waste, except ashes, that consists of:
(i) combustible waste material, including paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, or similar materials
(ii) noncombustible waste material, including glass, crockery, tin or aluminum cans, metal furniture, and similar materials that do not burn at ordinary incinerator temperatures of 1800 degrees Fahrenheit or less; and
(iii) discarded or worn-out manufactured materials and machinery, including motor vehicles and parts of motor vehicles, tires, aircraft, farm implements, building or construction materials, appliances, and scrap metal.

"solid waste" means:
garbage, rubbish, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations and from community and institutional activities. The term:
(A) does not include:
(i) solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows, or industrial discharges subject to regulation by permit issued under Chapter 26, Water Code;
(ii) soil, dirt, rock, sand, and other natural or man-made inert solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements; or
(iii) waste materials that result from activities associated with the exploration, development, or production of oil or gas or geothermal resources and other substance or material regulated by the Railroad Commission of Texas under Section 91.101, Natural Resources Code; and
(B) does include hazardous substances, for the purposes of Sections 361.271 through 361.277, 361.280, and 361.343 through 361.345.

"Motor vehicle" has the meaning assigned by Section 541.201, Transportation Code.

Violations

From Section 365.012

*(a) A person commits an offense if the person **disposes** or **allows or permits the disposal** of litter or other solid waste at a place that is not an approved solid waste site, including a place on or within 300 feet of a public highway, on a right-of-way, on other public or private property, or into inland or coastal water of the state.*

*(b) A person commits an offense if the person **receives** litter or other solid waste for disposal at a place that is not an approved solid waste site, regardless of whether the litter or other solid waste or the land on which the litter or other solid waste is disposed is owned or controlled by the person.*

*(c) A person commits an offense if the person **transports** litter or other solid waste to a place that is not an approved solid waste site **for disposal at the site**.*

*(j) The offenses prescribed by this section include the **unauthorized disposal** of litter or other solid waste in a **dumpster** or similar receptacle.*

Penalties

From Section 365.012 (d) - (g)

Non-Commercial Dumping

(a) 5 pounds or less; 5 gallons or less	Class C Misdemeanor
(b) 5 pounds but under 500 pounds; 5 gallons but under 100 c.f.	Class B Misdemeanor
(c) 500 pounds but under 1,000 pounds; 100 cubic feet but under 200 c.f.	Class A Misdemeanor
(d) Over 1,000 pounds; Over 200 cubic feet	State Jail Felony

Commercial Dumping (See definition of "Commercial Purpose")

(a) 5 pounds or less; 5 gallons or less	Class C Misdemeanor
(b) 5 pounds but under 200 pounds; 5 gallons but under 200 c.f.	Class A Misdemeanor
(c) Over 200 pounds; Over 200 cubic feet	State Jail Felony

Dumped for Any Reason (Commercial or Non-Commercial)

(a) Any amount of waste in a closed drum or barrel	State Jail Felony

Beware "Class C Trap"

Filing everything as a Class C with the JP? Work with local prosecutors to create ways to file Class A and B Misdemeanors and felonies appropriately.

Limits to Dumping on Your Own Land

From Section 365.012

(l) This section does not apply to an individual's disposal of litter or other solid waste if:
(1) the litter or waste is generated on land the individual owns;
(2) the litter or waste is not generated as a result of an activity related to a commercial purpose;
(3) the disposal occurs on land the individual owns; and
(4) the disposal is not for a commercial purpose.

Break for Farmers

From Section 365.014

(a) This subchapter does not apply to farmers:
(1) in handling anything necessary to grow, handle, and care for livestock; or
(2) in erecting, operating, and maintaining improvements necessary to handle, thresh, and prepare agricultural products or for conservation projects.

Break for Builders

From Section 365.012

(o) For purposes of a prosecution under Subsection (g), a generator creates a rebuttable presumption of lack of culpable mental state if the generator of the solid waste to be disposed of secures, prior to the hauler's receipt of the solid waste, a signed statement from the hauler that the solid waste will be disposed of legally. The statement shall include the hauler's **valid Texas driver's license number**.

Break for Absentee Landowners

From Section 365.014

(c) It is an affirmative defense to prosecution under Section 365.012 that:
(1) the storage, processing, or disposal took place on land owned or leased by the defendant;
(2) the defendant received the litter or other solid waste from another person;
(3) the defendant, after exercising due diligence, did not know and reasonably could not have known that litter or other solid waste was involved; and
(4) the defendant did not receive, directly or indirectly, compensation for the receipt, storage, processing, or treatment.

Temporary Storage Exemption

From Section 365.012

(k) This section does not apply to the temporary storage for future disposal of litter or other solid waste by a person on land owned by that person, or by that person's agent. The commission by rule shall regulate temporary storage for future disposal of litter or other solid waste by a person on land owned by the person or the person's agent.

3. Criminal Water Pollution and Automobile-Related

Texas Water Code Chapter 7
Enforcement
Subchapter E: Criminal Offenses and Penalties

Definitions

From TEXAS WATER CODE SEC. 26.001 DEFINITIONS

(5) "Water" or "water in the state" means groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the state or inside the jurisdiction of the state.

(19) "To discharge" includes to deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release or dispose of, or to allow, permit, or suffer any of these acts or omissions.

(13) "Pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any water in the state. The term:
(A) includes:
(i) tail water or runoff water from irrigation associated with an animal feeding operation or concentrated animal feeding operation that is located in a major sole source impairment zone as defined by Section 26.502; or
(ii) rainwater runoff from the confinement area of an animal feeding operation or concentrated animal feeding operation that is located in a major sole source impairment zone, as defined by Section 26.502; and
(B) does not include tail water or runoff water
from irrigation or rainwater runoff from other cultivated or uncultivated rangeland, pastureland, and farmland or rainwater runoff from an area of land located in a major sole source impairment zone, as defined by Section 26.502, that is not owned or
controlled by an operator of an animal feeding operation or concentrated animal feeding operation on which agricultural waste is applied.

(6) "Waste" means sewage, industrial waste, municipal waste, recreational waste, agricultural waste, or other waste, as defined in this section.

(12) "Other waste" means garbage, refuse, decayed wood, sawdust, shavings, bark, sand, lime, cinders, ashes, offal, oil, tar, dyestuffs, acids, chemicals, salt water, or any other substance, other than sewage, industrial waste, municipal waste, recreational waste, or agricultural waste.

(14) "Pollution" means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(21) "Point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants or wastes are or may be discharged into or adjacent to any water in the state.

Felony Water Pollution

TEXAS WATER CODE SEC. 7.145. INTENTIONAL OR KNOWING UNAUTHORIZED DISCHARGE.

(a) A person commits an offense if the person, acting intentionally or knowingly with respect to the person's conduct, discharges or allows the discharge of a waste or pollutant:
(1) into or adjacent to water in the state that causes or threatens to cause water pollution unless the waste or pollutant is discharged in strict compliance with all required permits or with an order issued or a rule adopted by the appropriate regulatory agency; or
(2) from a point source in violation of Chapter 26 or of a rule, permit, or order of the appropriate regulatory agency.

Individual:	$1,000 to $100,000 and/or five years confinement;
Person other than individual:	$1,000 to $250,000

Misdemeanor Water Pollution

TEXAS WATER CODE SEC. 7.147. UNAUTHORIZED DISCHARGE.

(a) A person commits an offense if the person discharges or allows the discharge of any waste or pollutant into any water in the state that causes or threatens to cause water pollution unless the waste or pollutant:
(1) is discharged in strict compliance with all required permits or with valid and currently effective order issued or rule adopted by the appropriate regulatory agency; or
(2) consists of used oil and the concentration of used oil in the waste stream resulting from the discharge as it enters water in the state is less than 15 parts per million following the discharge and the person is authorized to discharge storm water under a general permit issued under Section 26.040.

(b) An offense under this section may be prosecuted without alleging or proving any culpable mental state.

Individual:	$1,000 to $50,000 and/or one year confinement;
Person other than individual:	$1,000 to $100,000

Lead-Acid Batteries

TWC 7.185. KNOWING OR INTENTIONAL UNAUTHORIZED DISPOSAL OF LEAD-ACID BATTERIES. (a) A person commits an offense if the person knowingly or intentionally disposes of a lead-acid battery other than as provided by Section 361.451, Health and Safety Code.

Class A Misdemeanor

Tip

Texas Water Code Chapter 7(E) contains many felony laws that focus on such topics as water pollution, hazardous waste, medical waste and illegal burning. Do yourself a favor sometime and read all of Subchapter E.

Reckless Discharge and Endangerment

TEXAS WATER CODE SEC. 7.154. RECKLESS UNAUTHORIZED DISCHARGE AND ENDANGERMENT.

(a) A person commits an offense if the person, acting recklessly with respect to the person's conduct, discharges or allows the discharge of a waste or pollutant into or adjacent to water in the state and by that action places another person in imminent danger of death or serious bodily injury, unless the discharge is made in strict compliance with all required permits or with a valid and currently effective order issued or rule adopted by the appropriate regulatory agency.

Individual:	$1,000 to $100,000 and/or one year confinement;
Person other than individual:	$1,000 to $250,000

Used Oil

TWC 7.176. VIOLATIONS RELATING TO HANDLING OF USED OIL.
(a) A person commits an offense if the person:

(1) intentionally discharges used oil into:
(A) a sewer or septic tank; or
(B) a drainage system, surface water or groundwater, a watercourse, or marine water unless the concentration of used oil in the waste stream resulting from the discharge as it enters water in the state is less than 15 parts per million following the discharge and the person is authorized to discharge storm water under a general permit issued under Section 26.040;

(2) knowingly mixes or commingles used oil with solid waste that is to be disposed of in landfills or directly disposes of used oil on land or in landfills, unless the mixing or commingling of used oil with solid waste that is to be disposed of in landfills is incident to and the unavoidable result of the dismantling or mechanical shredding of motor vehicles, appliances, or other items of scrap, used, or obsolete metals;

(3) knowingly transports, treats, stores, disposes of, recycles, causes to be transported, or otherwise handles any used oil within the state:
(A) in violation of standards or rules for the management of used oil; or
(B) without first complying with the registration requirements of Chapter 371, Health and Safety Code, and rules adopted under that chapter;

(4) intentionally applies used oil to roads or land for dust suppression, weed abatement, or other similar uses that introduce used oil into the environment;

(5) violates an order of the commission to cease and desist an activity prohibited by this section or a rule applicable to a prohibited activity; or

(6) intentionally makes a false statement or representation in an application, label, manifest, record, report, permit, or other document filed, maintained, or used for purposes of program compliance.

Person:	$1,000 to $50,000 and/or five years confinement;
Previous Conviction:	$1,000 to $100,000 and/or fifteen years confinement

4. Criminal Outdoor Burning

Outdoor Burning Overview

There are two categories of illegal outdoor burning: felony and misdemeanor. Both types are criminal violations of the Texas Water Code.

(1) **Felony** illegal burning is simply a violation of the elements listed at TWC Sec. 7.182 or TWC Sec. 183.

(2) **Misdemeanor** illegal burning is always a criminal violation of TWC Sec. 7.177(a)(5). The "elements" are listed in the various sections of the Texas Outdoor Burning rule [30 Texas Administrative Code Sec. 111(b)].

Felony Outdoor Burning
Intentional/Knowing + Knowing Endangerment

TWC Sec. 7.183. INTENTIONAL OR KNOWING EMISSION OF AIR CONTAMINANT AND KNOWING ENDANGERMENT.

(a) A person commits an offense if the person intentionally or knowingly, with respect to the person's conduct, emits an air contaminant with the knowledge that the person is placing another person in imminent danger of death or serious bodily injury unless the emission is made in strict compliance with Chapter 382, Health and Safety Code, or a permit, variance, or order issued or a rule adopted by the commission.

Individual:	$2,000 to $500,000 and/or five years confinement;
Person other than individual:	$5,000 to $1,000,000

Felony Outdoor Burning
Reckless

TWC Sec. 7.182. RECKLESS EMISSION OF AIR CONTAMINANT AND ENDANGERMENT.

(a) A person commits an offense if the person recklessly, with respect to the person's conduct, emits an air contaminant that places another person in imminent danger of death or serious bodily injury, unless the emission is made in strict compliance with Chapter 382, Health and Safety Code, or a permit, variance, or order issued or a rule adopted by the commission.

Individual:	$1,000 to $250,000 and/or five years confinement;
Person other than individual:	$2,000 to $500,000

Use this one ... its easier!

Misdemeanor Outdoor Burning

It is a special misdemeanor ($1,000 to $50,000 and/or six months confinement for an individual; $1,000 to $100,000 for a person other than an individual) to violate the Texas Outdoor Burning Rule [30 TAC 111(b)].

TWC Sec. 7.177. VIOLATIONS OF CLEAN AIR ACT.
(a) A person commits an offense if the person intentionally or knowingly, with respect to the person's conduct, violates:
(5) an order, permit, or exemption issued or a **rule adopted under Chapter 382, Health and Safety Code.**

The Texas Outdoor Burning Rule was adopted under Chapter 382 on **September 3, 1996** (published in Texas Register on that date). Your prosecutor will need this information to tie a "violation of the rule" to a "criminal violation of TWC Sec. 7.177(a)(5)."

Individual:	$1,000 to $50,000 and/or six months confinement;
Person other than individual:	$1,000 to $100,000

Texas Outdoor Burning Rule

Violations of the provisions of this rule are both:

(1) An ADMINISTRATIVE violation that may be handled by the TCEQ; and,

(2) A CRIMINAL violation to be handled by the local jurisdiction.

For criminal enforcement, just treat the various sections as sets of elements.

Outdoor Burning Generally Prohibited

From Rule Sec. 111.201 General Prohibition

No person may cause, suffer, allow, or permit any outdoor burning within the State of Texas, except as provided by this subchapter or by orders or permits of the commission.

Recreational/Ceremony/Cooking/Warmth Fires OK

Summary of Rule Sec. 111.207 Exception for Fires Used for Recreation, Ceremony, Cooking, and Warmth

These types of fires OK unless a county burn ban or local emergency declaration is in effect.

The following material cannot be burned: Electrical insulation, treated lumber, plastics, non-wood construction/demolition materials, heavy oils, asphaltic materials, potentially explosive materials, chemical wastes, and items containing natural or synthetic rubber.

Fire-Fighting Training Fires OK

Summary of Rule Sec. 111.205 Exception for Fire Training

Fire departments can conduct fire-fighter training with notice and permission of TCEQ regional offices. Notice requirements vary with size of department. Permission will be lost for doing demolition fires as "fire-fighter" training.

Some Disposal Fires OK

Summary of Rule Sec. 111.209 Exception for Disposal Fires

(1) OK to burn domestic waste, from a single residence (not housing over three families) when the local government (city or county) doesn't "provide or authorize" waste collection services at the residence.

(1a) Which means that commercial waste cannot be burned without a TCEQ permit; and,

(1b) Waste from multi-family residents cannot be burned without a TCEQ permit.

"Domestic waste" does NOT include: such things as tires, non-wood construction debris, furniture, carpet, electrical wire, and appliances.

(2) OK to burn diseased animal carcass burning when burning is the most effective means of controlling the spread of disease.

(3) OK for veterinarians to burn animal remains in accordance with Texas Occupations Code, §801.361, Disposal of Animal Remains.

(4) OK to burn plant growth waste on the property where it grew, in counties where air quality meets National Ambient Air Quality Standards. This applies to all unincorporated areas and inside cities too, UNLESS the city prohibits such burning by ordinance. Counties cannot prohibit this burning, except during burn bans. In urban areas where the air is poor (i.e., NAAQS not met), onsite plant growth burning is OK only for very limited reasons and only when there are no feasible alternatives (and there always are).

(5) OK to have consolidated plant growth burn sites in counties under 50,000, as long as they are outside the city and each burn is supervised by a full-time professional fire-fighter. Other site management rules apply.

(6) OK to burn crop residue, if done in accordance with the safety rules.

(7) OK for cities, in counties of any size, to burn brush every couple of months at a site they own outside the city limit, with TCEQ's prior approval.

Prescribed Burns OK

Summary of Rule Sec. 111.211 Exception for Prescribed Burn

Prescribed burning for forest, range and wildland/wildlife management purposes (any county), and coastal salt-marsh management burning (in selected counties) is OK.

TIPS

1. Make sure your own jurisdiction isn't breaking the law by illegally dumping.
2. Consider handling water pollution cases as H&S 365 illegal dumping to keep it simple.
3. Resolve to attend a TCEQ-sponsored 3-day environmental enforcement training.
4. Form local enforcement coalitions with city and county officers.
5. Join the Code Enforcement Association of Texas.
6. Join the Texas Environmental Law Enforcement Association
7. Develop evidence standards with local prosecutors.
8. Provide stories to local print and broadcast media.
9. Join and become active in local Keep Texas Beautiful.

5. Oil and Gas Waste

Oil and Gas Waste Overview

Oil and gas waste hauling and disposal are controlled administratively by Texas Railroad Commission (RRC) and criminally by local government. RRC has no criminal enforcement unit.

Local control of oil and gas waste
(1) Municipal Codes
(2) Health Nuisances by THSC Sec. 341.013(c)
(3) Water Pollution by TWC Sec. 7.145 and Sec. 7.147
(4) Texas Water Code Chapter 29
(5) Texas Natural Resources Code Chapter 91

Oil and Gas Waste Defined

NRC Sec. 91.1011. OIL AND GAS WASTE.
(a) In this subchapter, "oil and gas waste" means waste that arises out of or incidental to the drilling for or producing of oil or gas, including waste arising out of or incidental to:
(1) activities associated with the drilling of injection water source wells which penetrate the base of useable quality water;
(2) activities associated with the drilling of cathodic protection holes associated with the cathodic protection of wells and pipelines subject to the jurisdiction of the commission;
(3) activities associated with gasoline plants, natural gas or natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants;
(4) activities associated with any underground natural gas storage facility, provided the terms "natural gas" and "storage facility" shall have the meanings set out in Section 91.173, Natural Resources Code;
(5) activities associated with any underground hydrocarbon storage facility, provided the terms "hydrocarbons" and "underground hydrocarbon storage facility" shall have the meanings set out in Section 91.201, Natural Resources Code; and
(6) activities associated with the storage, handling, reclamation, gathering, transportation, or distribution of oil or gas prior to the refining of such oil or prior to the use of such gas in any manufacturing process or as a residential or industrial fuel.
(b) "Oil and gas waste" includes salt water, brine, sludge, drilling mud, and other liquid, semiliquid, or solid waste material.

Municipal Codes

If you want to enforce oil and gas waste hauling dumps and spills in your municipal court you'll need a good ordinance.

Local Government Code
Sec. 51.001. ORDINANCE, RULE, OR REGULATION NECESSARY TO CARRY OUT OTHER POWERS.
The governing body of a municipality may adopt, publish, amend, or repeal an ordinance, rule, or police regulation that:
(1) is for the good government, peace, or order of the municipality or for the trade and commerce of the municipality; and
(2) is necessary or proper for carrying out a power granted by law to the municipality or to an office or department of the municipality.

RRC and TCEQ Memorandum of Understanding

1. Read it in full at 16 T.A.C. 3.30;
2. MoU reflects which agency will do ADMINISTRATIVE enforcement under statutes passed by the State Legislature;
3. Most on-site enforcement is by RRC, including solid waste generated by the living process at the site;
4. TCEQ does NOT do administrative enforcement of trash or health nuisances (DR program) at well sites permitted by RRC;
5. Your local government is NOT a party to the MoU;
6. Enforce violations criminally with local police, deputies, and constables.

TWC Chapter 29 Oil and Gas Waste Haulers

Sec. 29.041. HAULING WITHOUT PERMIT.
No hauler may haul or dispose of oil and gas waste off the lease, unit, or other oil or gas property where it is generated unless the hauler has a permit issued under this chapter.

Sec. 29.042. EXCEPTIONS.
(a) A person may haul oil and gas waste for use in connection with drilling or servicing an oil or gas well without obtaining a hauler's permit under this chapter.
(b) The commission by rule may except from the permitting requirements of this chapter specific categories of oil and gas waste other than salt water.

Sec. 29.043. USING HAULERS WITHOUT PERMIT.
No person may knowingly utilize the services of a hauler to haul or dispose of oil and gas waste off the lease, unit, or other oil or gas property where it is generated if the hauler does not have a permit as required under this chapter.

Sec. 29.044. DISPOSING OF OIL AND GAS WASTE.
(a) No hauler may dispose of oil and gas waste on public roads or on the surface of public land or private property in this state in other than a railroad commission-approved disposal facility without written authority from the railroad commission.
(b) No hauler may dispose of oil and gas waste on property of another in other than a railroad commission-approved disposal facility without the written authority of the landowner.

Sec. 29.045. USE OF UNMARKED VEHICLES.
No person who is required to have a permit under this chapter may haul oil and gas waste in a vehicle that does not bear the owner's name and the hauler's permit number. This information shall appear on both sides and the rear of the vehicle in characters not less than three inches high.

Sec. 29.046. PENALTY.
A person who violates any provision of this chapter is guilty of a misdemeanor and upon conviction is punishable by a fine of not less than $100 nor more than $1,000 or by confinement in the county jail for not more than 10 days or by both.

Individual:	Fine $100 to $1,000 and/or Confinement to 10 days
Person other than individual:	Fine $100 to $1,000;

Contact: John Ockels ockels@tidrc.com

Natural Resources Code Chapter 91

Sec. 91.101. RULES AND ORDERS.
To prevent pollution of surface water or subsurface water in the state, the commission shall adopt and enforce rules and orders and may issue permits relating to:
(1) the drilling of exploratory wells and oil and gas wells or any purpose in connection with them;
(2) the production of oil and gas, including:
(A) activities associated with the drilling of injection water source wells which penetrate the base of useable quality water;
(B) activities associated with the drilling of cathodic protection holes associated with the cathodic protection of wells and pipelines subject to the jurisdiction of the commission;
(C) activities associated with gasoline plants, natural gas or natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants;
(D) activities associated with any underground natural gas storage facility, provided the terms "natural gas" and "storage facility" shall have the meanings set out in Section 91.173, Natural Resources Code;
(E) activities associated with any underground hydrocarbon storage facility, provided the terms "hydrocarbons" and "underground hydrocarbon storage facility" shall have the meanings set out in Section 91.201, Natural Resources Code; and
(F) activities associated with the storage, handling, reclamation, gathering, transportation, or distribution of oil or gas prior to the refining of such oil or prior to the use of such gas in any manufacturing process or as a residential or industrial fuel;
(3) the operation, abandonment, and proper plugging of wells subject to the jurisdiction of the commission; and
(4) the discharge, storage, handling, transportation, reclamation, or disposal of oil and gas waste as defined in Section 91.1011 of this subchapter, or of any other substance or material associated with any operation or activity regulated by the commission under Subdivisions (1), (2), and (3) of this section.

Criminal Violation #1
NRC Sec. 91.002. CRIMINAL PENALTY.
(a) A person who wilfully or with criminal negligence violates Section 91.101 of this code or a rule, order, or permit of the commission issued under that section commits an offense.
(b) An offense under Subsection (a) of this section is punishable by a fine of not more than $10,000 a day for each day a violation is committed.
(c) Venue for prosecution of an alleged violation of this section is in a court of competent jurisdiction in the county in which the violation is alleged to have occurred.

All violators:	Fine to $10,000 per day per event

Note on Handling Outdoor Burning Violations

1. Inside a city, use municipal fire codes to control illegal burning of waste.

2. In unincorporated areas, use TWC Sec. 7.177(a)(5) [criminalizes the Outdoor Burning Rule] to control misdemeanor commercial waste burning.

3. Anywhere, use TWC Secs. 7.182 and 7.183 to handle felony burning of all forms of commercial waste.

6. Oil and Gas Waste (Continued)

Criminal Violation #2

NRC Sec. 91.143. FALSE APPLICATIONS, REPORTS, AND DOCUMENTS AND TAMPERING WITH GAUGES.

(a) A person may not:
(1) make or subscribe any application, report, or other document required or permitted to be filed with the commission by the provisions of Title 102, Revised Civil Statutes of Texas, 1925, as amended, including provisions of this code formerly included in that title, knowing that the application, report, or other document is false or untrue in a material fact;
(2) aid or assist in, or procure, counsel, or advise the preparation or presentation of any of these applications, reports, or other documents that are fraudulent, false, or incorrect in any material matter, knowing them to be fraudulent, false, or incorrect in any material matter;
(3) knowingly simulate or falsely or fraudulently execute or sign such an application, report, or other document;
(4) knowingly procure these applications, reports, or other documents to be falsely or fraudulently executed, or advise, aid in, or connive at this execution; or
(5) knowingly render inaccurate any monitoring device required to be maintained by a commission rule, order, or permit.

(b) A person commits an offense if the person violates this section. An offense under this section is a felony punishable by:
(1) imprisonment in the Texas Department of Criminal Justice for a term of not less than two years or more than five years;
(2) a fine of not more than $10,000; or
(3) both the imprisonment and the fine.

All violators: Fine to $10,000 and/or 5 (five) years confinement.

Criminal Violation #3

NRC Sec. 91.458. CRIMINAL PENALTY.
(a) A person who violates Section 91.452 of this code or an order of the commission under Subsection (a), Section 91.457, commits an offense.
(b) An offense under this section is a Class A misdemeanor.

Note: Sec. 91.452. PROHIBITED ACTIVITY. Except as provided by this subchapter, a person conducting oil and gas development or production operations, geothermal operations, or underground hydrocarbon storage operations may not use a saltwater disposal pit for storage or evaporation of oil field brines.

Sec. 91.457 REMOVAL OF UNAUTHORIZED PIT has to do with RRC directing the closure of a saltwater pit.

All violators: Class A Misdemeanor (Fine to $4,000 and/or 1 year in jail)

Health Nuisance Violations

THSC Sec. 341.013 (c) Waste products, offal, polluting material, spent chemicals, liquors, brines, garbage, rubbish, refuse, used tires, or other waste of any kind may not be stored, deposited, or disposed of in a manner that may cause the pollution of the surrounding land, the contamination of groundwater or surface water, or the breeding of insects or rodents.

All violators: Fine of $10 to $200

Criminal Violation #4
Pertaining to Oil and Gas Hazardous Waste

NRC Sec. 91.604. CRIMINAL PENALTY.
(a) A person who knowingly violates a rule, order, or permit of the commission issued under this subchapter commits an offense.
(b) An offense under this section is punishable by imprisonment for up to six months, by a fine of up to $10,000 for each day the violation is committed, or by both.
(c) Venue for prosecution under this section is in the county in which the violation is alleged to have occurred.

All violators: Fine to $10,000 and/or confinement to six months

General Local Criminal Enforcement of Oil and Gas Waste Violations

1. THSC Chapter 365 -- The Litter Abatement Act -- CANNOT be used for oil and gas waste (it is specifically excluded from the definition of "solid waste" covered by this law).

2. The criminal violations in TWC Chapter 7 (Subchapter E) can be used to deal with ol and gas waste dumped in an unauthorized place (i.e., felony and misdemeanor water pollution, used motor oil, general hazardous waste, lead-acid batteries, illegal outdoor burning).

3. Health and public nuisance laws can be used (i.e., THSC Chapters 341 and 343) EXCEPT by a Designated Representative of the TCEQ (precluded by MoU).

4. Local civil suits under TWC Sec. 7.351 MAY be used in some cases, but note closely the restrictions of some civil suits to those instigated by the RRC in NRC Sec. 91.

5. Use TWC Chapter 29 and NRC Chapter 91 criminal sections to handle specific oil and gas waste criminal violations.

6. Since the RRC does no criminal enforcement of oil and gas waste violations, this will come from local government police, deputies, and constables or it will NOT happen at all.

Train Your Police!

Working with the Railroad Commission

1. Get to know the administrative enforcement officer working your county (they have no CRIMINAL enforcement unit or process).

2. Remember that they MOST LIKELY have not studied the CRIMINAL enforcement provisions of state law, including those specifically for oil and gas waste (i.e., TWC Chapter 29 and NRC Chapter 91).

3. Get in the habit of letting the RRC administrative enforcement officer know when you are working a criminal case against a permit holder; they may want to also get involved.

Felony Water Pollution

TEXAS WATER CODE SEC. 7.145. INTENTIONAL OR KNOWING UNAUTHORIZED DISCHARGE.

(a) A person commits an offense if the person, acting intentionally or knowingly with respect to the person's conduct, discharges or allows the discharge of a waste or pollutant:
(1) into or adjacent to water in the state that causes or threatens to cause water pollution unless the waste or pollutant is discharged in strict compliance with all required permits or with an order issued or a rule adopted by the appropriate regulatory agency; or
(2) from a point source in violation of Chapter 26 or of a rule, permit, or order of the appropriate regulatory agency.

Individual:	$1,000 to $100,000 and/or five years confinement;
Person other than individual:	$1,000 to $250,000

Misdemeanor Water Pollution

TEXAS WATER CODE SEC. 7.147. UNAUTHORIZED DISCHARGE.

(a) A person commits an offense if the person discharges or allows the discharge of any waste or pollutant into any water in the state that causes or
threatens to cause water pollution unless the waste or pollutant:
(1) is discharged in strict compliance with all required permits or with valid and currently effective order issued or rule adopted by the appropriate regulatory agency; or
(2) consists of used oil and the concentration of used oil in the waste stream resulting from the discharge as it enters water in the state is less than 15 parts per million following the discharge and the person is authorized to discharge storm water under a general permit issued under Section 26.040.

(b) An offense under this section may be prosecuted without alleging or proving any culpable mental state.

Individual:	$1,000 to $50,000 and/or one year confinement;
Person other than individual:	$1,000 to $100,000

Used Motor Oil

TWC 7.176. VIOLATIONS RELATING TO HANDLING OF USED OIL.
(a) A person commits an offense if the person:
(2) knowingly mixes or commingles used oil with solid waste that is to be disposed of in landfills or directly disposes of used oil on land or in landfills, unless the mixing or commingling of used oil with solid waste that is to be disposed of in landfills is incident to and the unavoidable result of the dismantling or mechanical shredding of motor vehicles, appliances, or other items of scrap, used, or obsolete metals;Person:

Person:	$1,000 to $50,000 and/or five (5) years confinement;

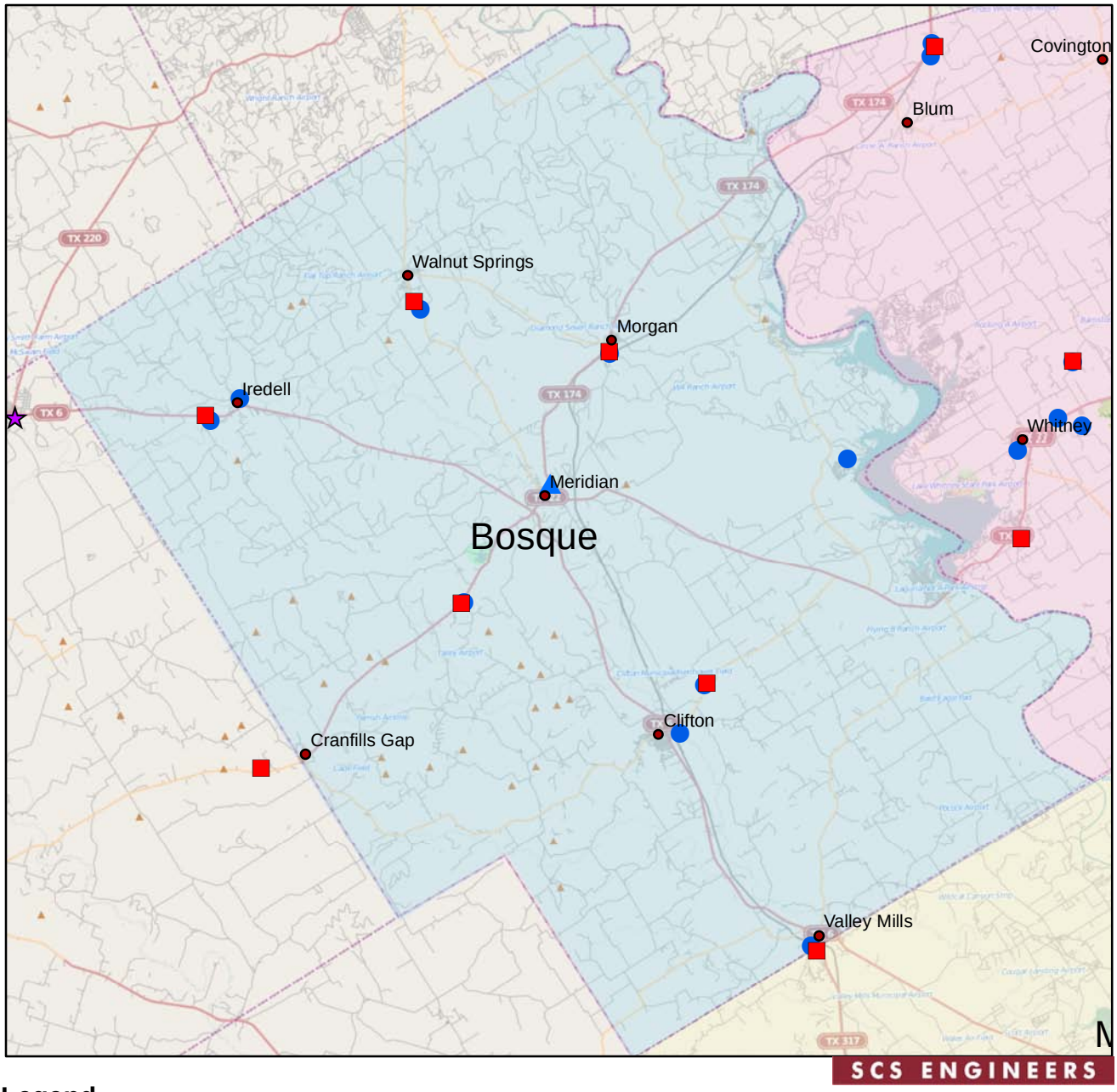
Texas Environmental Enforcement Options

	# Cases	Case Categories	Enforced By	Violations	Attorneys	Court
Civil	Very Few	**Major Civil Violations** To $25,000 per day; 1/2 of civil penalties stay local	Your city or county attorney files suits in District Court *or* State Attorney General	Authority: TWC 7.351 THSC Chapter 361 THSC Chapter 382 TWC Chapter 26 Several other chapters and rules, permits, orders issued	Your County Attorney or City Attorney files suit; State included as necessary party	District Court
Criminal	Few	**Felonies** > 1 year; $10,000+	Your police department; county sheriff; other peace officers TCEQ Environmental Crime Unit TPWD Env Crimes	TWC Chapter 7 THSC Chapter 365	District Attorney	District Court
	Many	**Class A Misdemeanors** 1 year; to $4,000		THSC Chapter 365 TWC Chapter 7 (few)	County Attorney	County Court
	Many	**Class B Misdemeanors** 6 mos; to $2,000		THSC Chapter 365 TWC Chapter 7 (few)		
	Very Many	**Class C Misdemeanors** To $500		Oil and Gas Waste TWC Chap 29 Nat Res Sec. 91.002 + Statewide Rule 8	File directly with JP; County Attorney presents case	Justice Court or Municipal Court
Health	Very Many	**Health Nuisance Violations** Civil/criminal to $200 Subsequent to $1,000	Your Health Department; police department; county sheriff	THSC Chapter 341 THSC Chapter 343	File directly with JP; County Attorney presents case; City Attorney	Justice Court or Municipal Court
Code	Few	**Code Violation Injunctions**	Your city	Local Government Code Sec 54.016	City Attorney	District / or Co Court
	Most of All [400,000 yr]	**Municipal Code Violations** To $500 Some to $2,000	Municipal code enforcement	Municipal Codes (similar, but unique for each city)	City Attorney	Municipal Court
Admin	Some	**Administrative Rule Violations**	TCEQ Administrative	State Rules	N/A	N/A
		Remember: Administrative enforcement is NOT local enforcement!				

Source: Texas Illegal Dumping Resource Center (www.tidrc.com) Additional information: ockels@mac.com

Appendix D
Maps of Solid Waste Facilities in the HOTCOG Region

MSW Facilities in Bosque County



Legend

MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

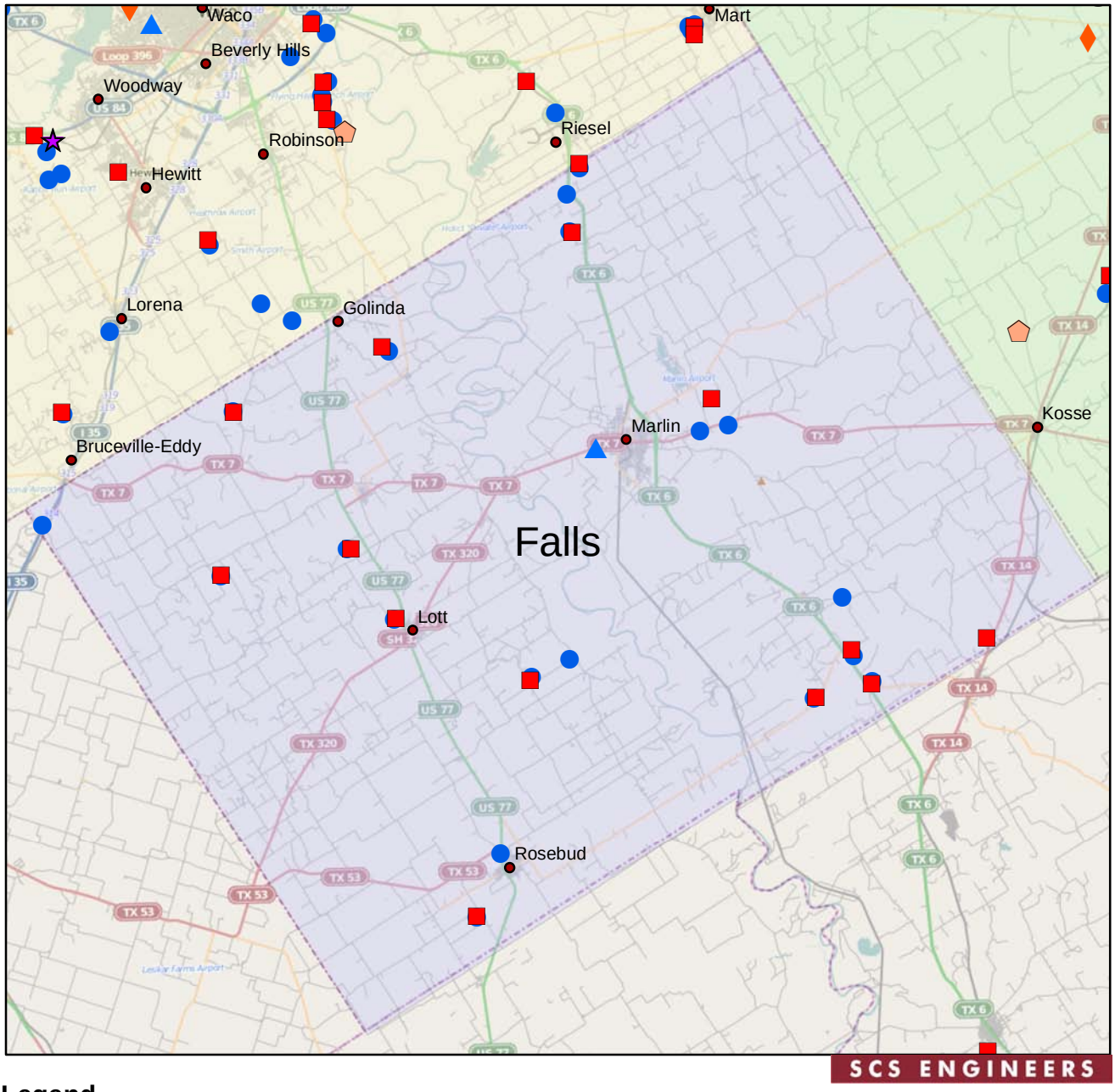
Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 35,500 feet

MSW Facilities in Falls County



Legend

MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

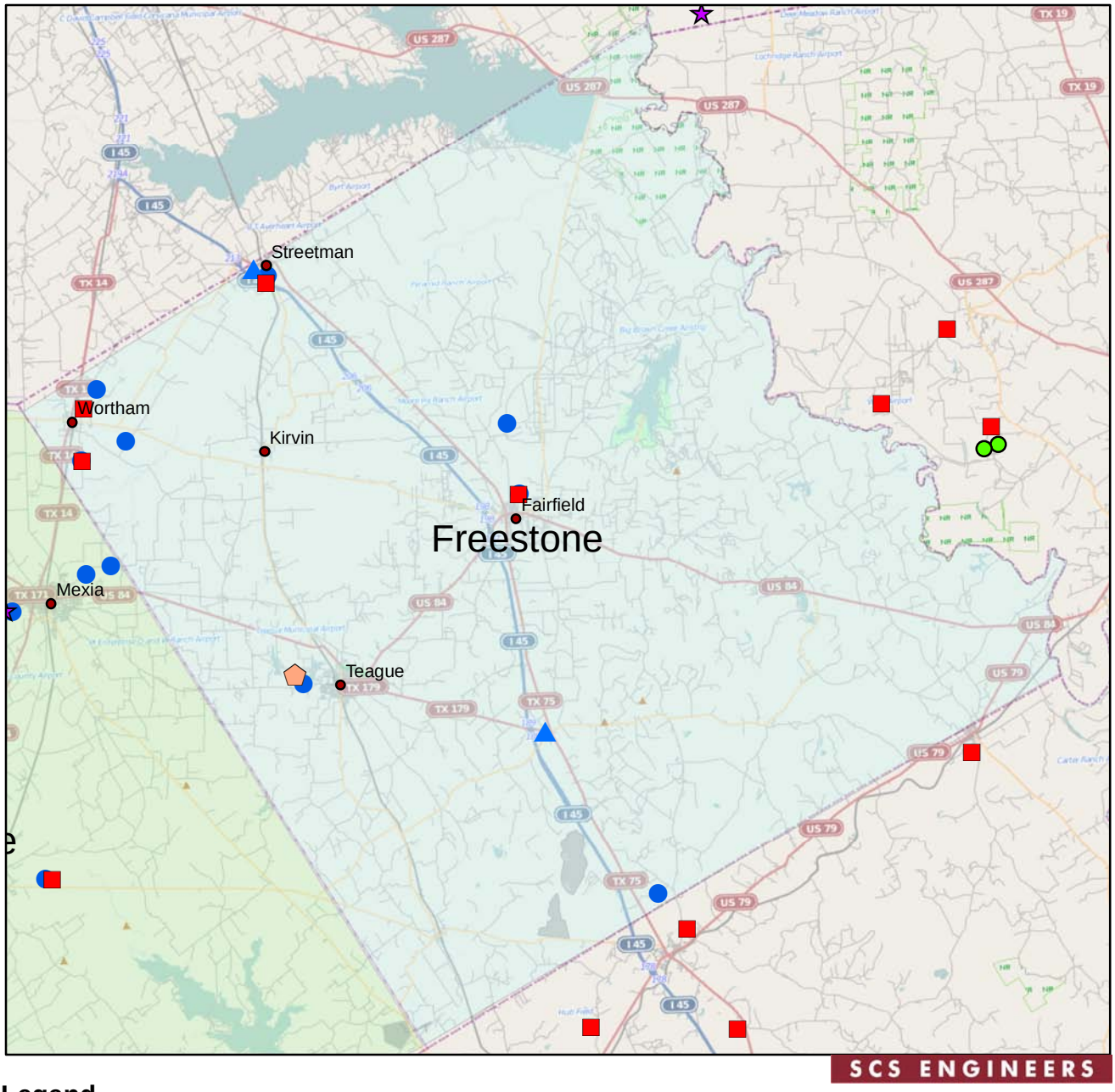
Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 32,500 feet

MSW Facilities in Freestone County



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MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

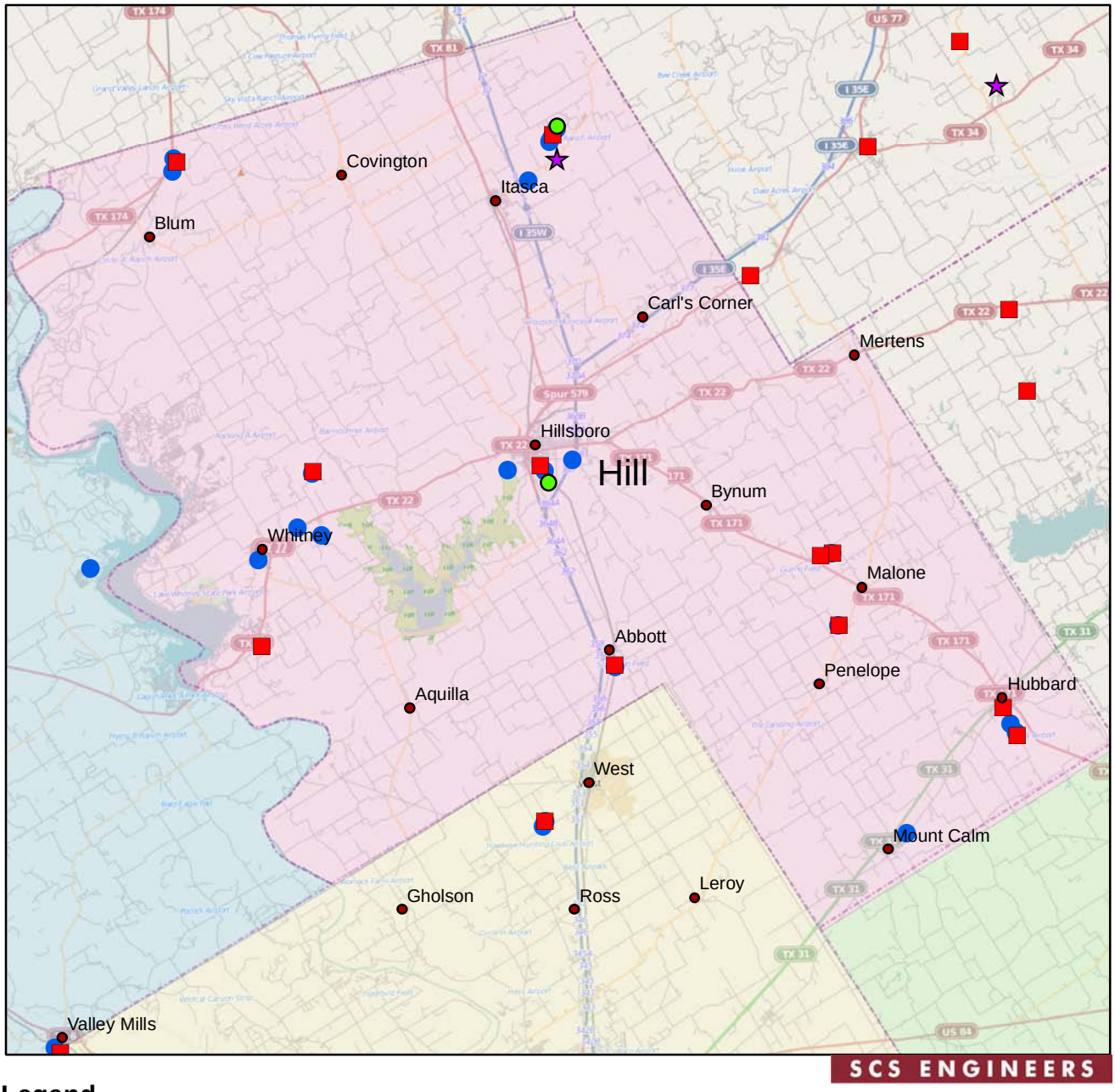
Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 35,000 feet

MSW Facilities in Hill County



Legend

MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

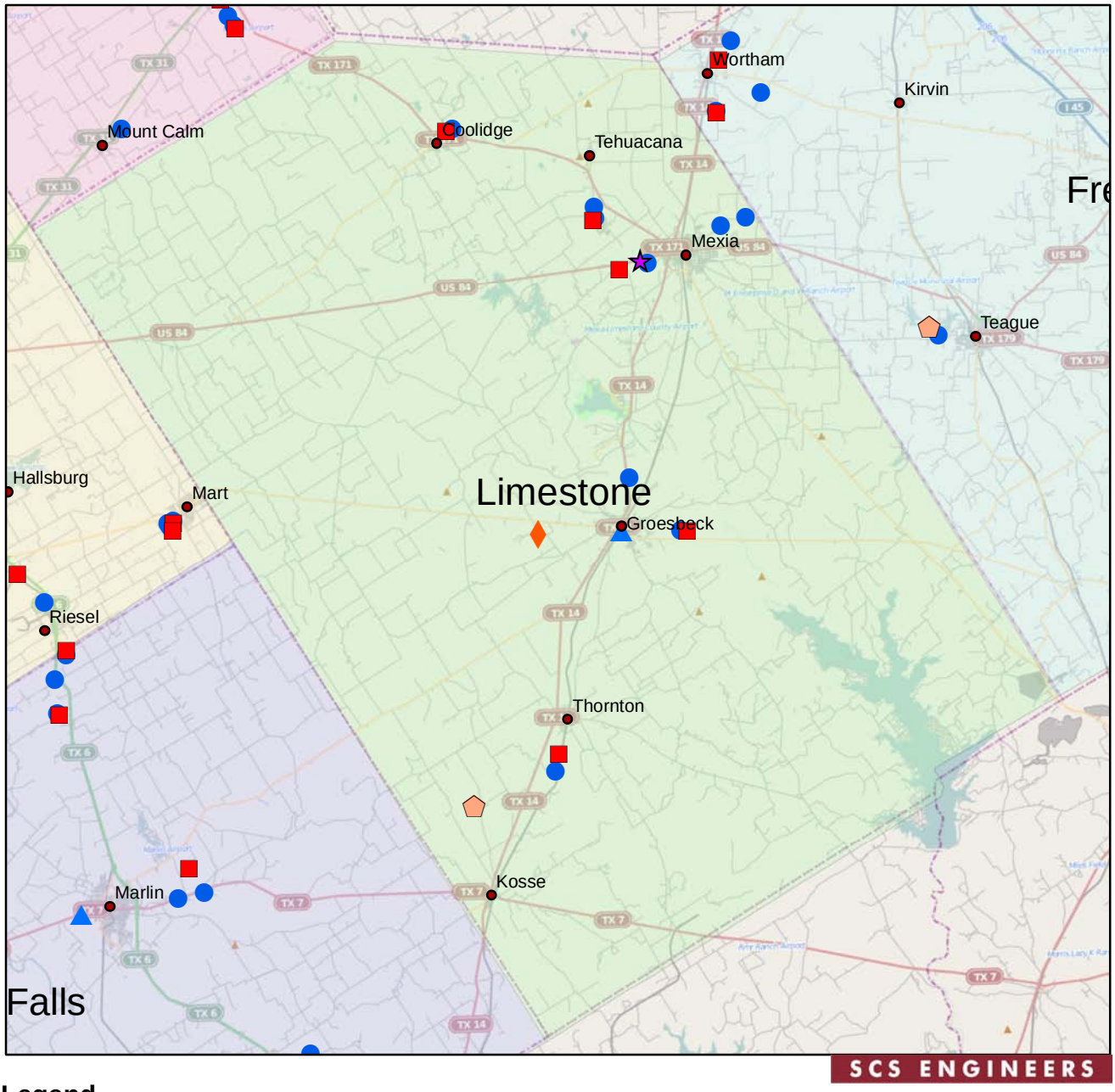
Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 36,000 feet

MSW Facilities in Limestone County



Legend

MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

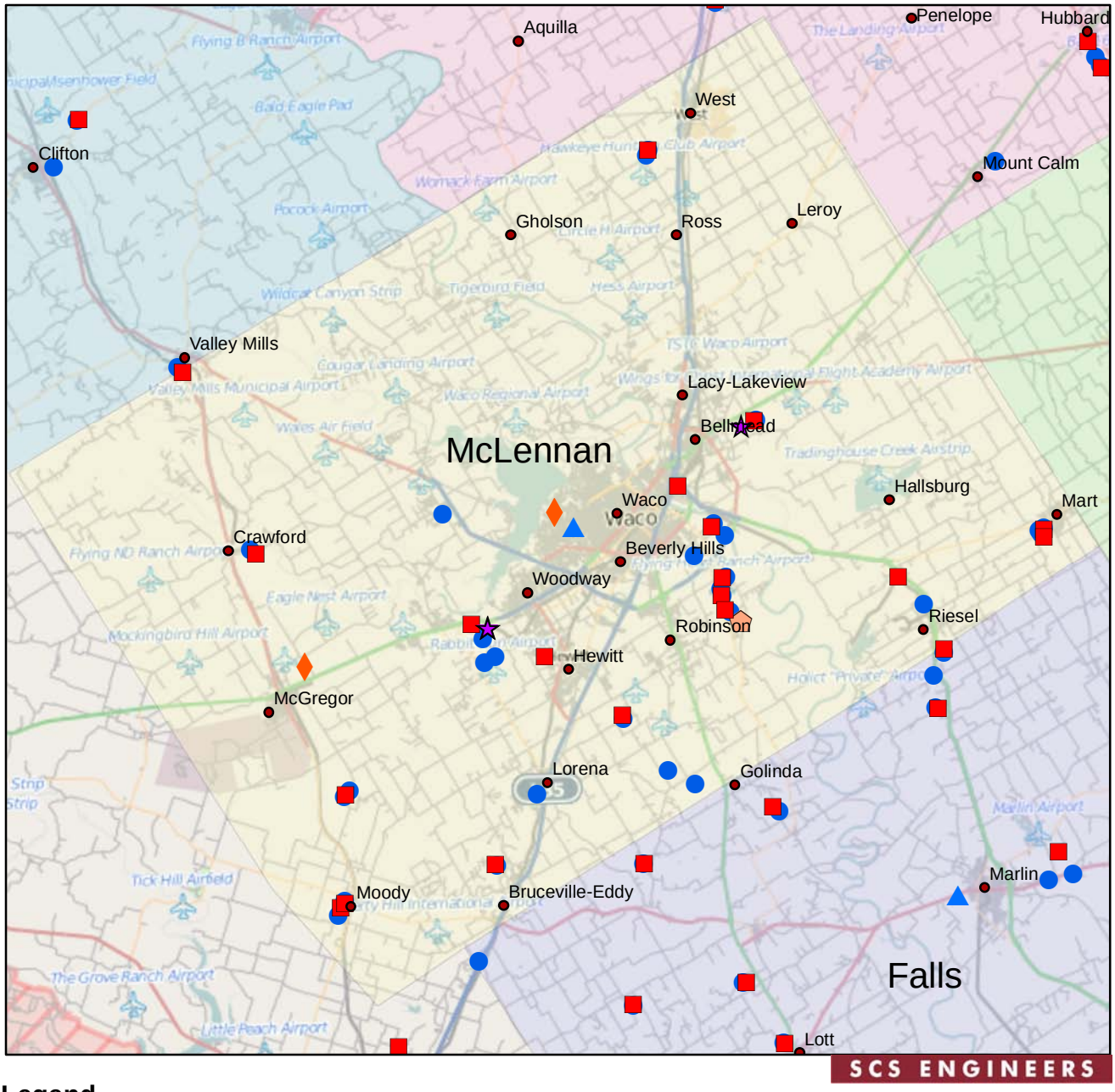
Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 35,000 feet

MSW Facilities in McLennan County



Legend

MSW Facilities From TCEQ Database

- ACTIVE LANDFILLS
- OTHER ACTIVE MSW FACILITIES
- CLOSED
- INACTIVE
- MISSING
- POST CLOSURE

Closed Landfills From HOTCOG Database

- Closed Landfills
- Citizens Collection Stations

N

1 inch = 37,500 feet

Appendix E
Closed Landfill Inventory

HOTCOG Region Closed Landfill Inventory				
County	Landfill Number	Date Open	Date Closed	Size (Acres)
Bosque	943	1/1/1946	6/3/1996	8.50
	1165	1952	1/20/1984	3.00
	1168	11/1/1966	1/26/1990	0.97
	U155	unknown	6/2/1905	unknown
	U156	unknown	unknown	unknown
	U159	unknown	unknown	10.00
Falls	181	5/19/1976	2/23/1995	62.52
	333	1/19/1973	10/23/1989	65.00
	784	4/1/1975	12/8/1983	5.00
	978	9/4/1977	9/29/1986	4.03
	1377	unknown	8/20/1993	5.50
	U68	unknown	7/11/1988	unknown
	U1004	unknown	unknown	25.00
	U1005	unknown	unknown	5.00
	U1006	unknown	unknown	11.99
	U1007	unknown	unknown	1.00
	U2264	1992	1994	3.00
Freestone	145	11/13/1967	3/12/1981	10.70
	455	1/1/1968	7/1/1993	65.50
	1266	4/12/1979	4/14/1999	20.00
	U1031	unknown	unknown	16.00
	U1032	unknown	unknown	5.00
	U1033	unknown	unknown	1.00
Hill	152	1/1/1925	1/7/1896	11.42
	183	1976	1979	0.80
	200	1975	12/1/1985	46.11
	241	10/15/1974	1/12/1977	56.00
	703	1/1/1969	10/2/1990	23.10
	1080	10/18/1978	7/1/1993	150.45
	1221	10/1/1972	10/7/1982	2.30
	1350	10/20/1980	2/8/1995	18.09
	1488	1/1/1961	1/20/1988	3.00
	1864	1/1/1965	unknown	5.00
	U264	unknown	1972	unknown
	U266	1910	1972	13.00
	U267	1940	1971	unknown
	U268	unknown	unknown	unknown
	U269	unknown	unknown	unknown
	U2266	1989	1991	40.00
	U2460	1991	1991	2.00

County	Landfill Number	Date Open	Date Closed	Size (Acres)
Limestone	206	unknown	unknown	26.83
	1031	unknown	unknown	110.00
	U372	unknown	unknown	2.00
	U373	unknown	unknown	60.00
	U374	1946	1971	2.00
	U2267	1994	1995	2.00
	U2268	1985	1991	2.00
McLennan	27	4/30/1976	3/27/1991	29.78
	51	3/20/1973	6/1/1977	25.00
	52	10/16/1975	1987	27.00
	348A	2/1/1956	11/21/1990	6.00
	559	5/9/1955	9/30/1990	48.83
	567	5/1/1968	2/18/1990	25.06
	710	7/22/1977	5/25/1982	170.00
	917	5/21/1968	1/10/1983	3.00
	958	2/1/1930	3/26/1990	2.00
	1176	5/13/1905	5/19/1994	2.89
	1361	5/23/1905	6/24/1988	15.32
	1852	10/10/1985	unknown	30.00
	1944	8/4/1986	unknown	38.30
	U416	unknown	5/25/1905	3.00
	U418	unknown	unknown	unknown
	U420	unknown	unknown	11.00
	U2283	1994	1995	17.00
	U2284	1982	1983	2.00
	U2285	1989	1991	3.00

Updated as of August 2013

Appendix F
Waste-to-Energy and Waste Conversion Options

This appendix is a brief primer of what solid waste managers and public officials need to know about waste-to-energy and the new waste conversion technologies. The following paragraphs are condensed from an article authored by Marc Rogoff and Bruce Clark, *Staying Informed of Solid Waste Disposal Options* and a book authored by Marc Rogoff and Francois Screve, Waste-to-Energy Technologies and Project Implementation, Second Edition, Elsevier/William Andrew, Waltham, MA, 2011. The reader is referred to these references for further background on the subject.

INTRODUCTION

Since 2004, new solid-waste conversion technologies have emerged that may be a game-changer in some locales for solid-waste disposal. These technologies are being touted by their developers with claims that they produce essentially zero air emissions; reduce greenhouse gases; incur costs that are similar to landfilling; produce energy and marketable byproducts; and offer opportunities to mine closed landfills thus reducing local liabilities.

When faced with such claims, public officials ask them themselves: Are these offers too good to be true?

This appendix seeks to provide a general overview of new solid-waste conversion technologies as well as a methodology that public officials can use to preliminarily assess the feasibility of this type of project. This section builds on the lessons learned from more than 50 feasibility assessments of new waste-conversion technologies and provides some basic guidance on the technologies themselves.

THE CURRENT PICTURE

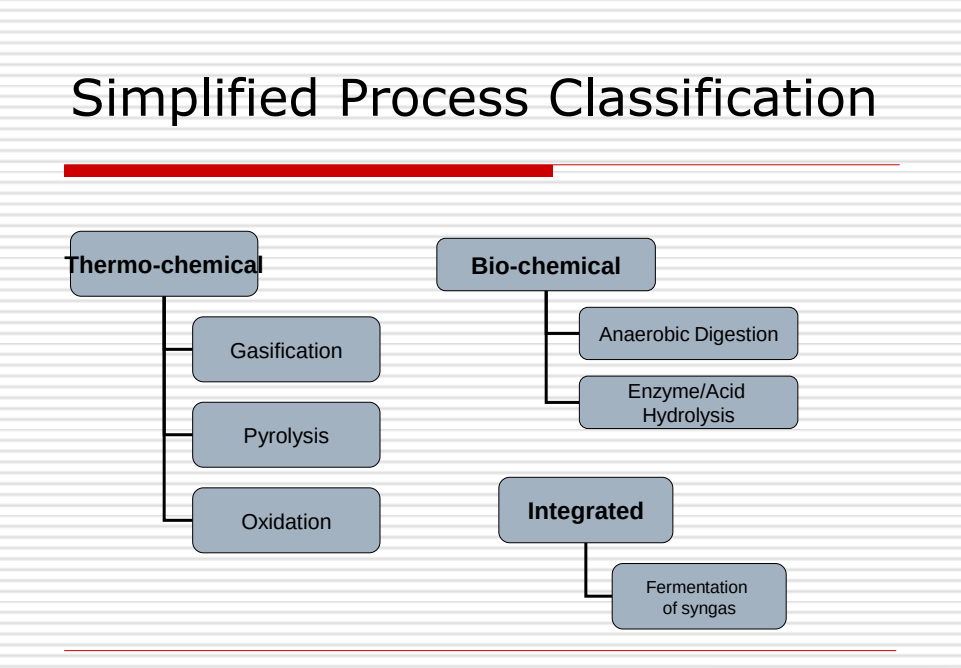
Communities without mass burn, waste-to-energy (WTE) plants have become totally dependent on landfill disposal. At the same time, privatization of landfills is increasing and in many cases, with more costly long-hauls to remote facilities. Tipping fees (i.e., gate fee or what the landfill owner charges a customer, typically per ton) are rising. Local government budgets are tight and everyone is looking at ways to reduce costs. Onto this scene enters the developer for a new waste-conversion plant. The proposal to local officials typically involves no up-front costs to local governments, and many the other claims mentioned previously. Since this is all new, many officials have no experience or road map to help them evaluate the claims.

Exhibit 5 provides a brief overview of methods that have recently been developed to use energy produced by converting solid-waste products. These methods are numerous and can be grouped in various ways. This exhibit also illustrates technologies that have been developed to try and extract different benefits from the processed waste stream, including:

- Gases for power production or feedstock for vehicular fuels.
- Basic chemicals for use as a raw feedstock.

- Compost and soil amendments.
- Slag is glass, soil, metals, and ash compounds that are present in the plasma arc gasification waste melt and are converted into a hard, glass substance for use as alternative building material.
- Char or a charcoal-like substance that is produced in a pyrolysis process can be used as a soil-building amendment.

Exhibit 1. New Waste-Conversion Technologies.



Source: SCS Engineers©

Some of the common definitions for these new technologies are listed in Exhibit 2.

Exhibit 2. Common Definitions of New Waste-Conversion Technologies.

Common Terms	Brief Definition
Anaerobic digestion	A biological process that takes place in a closed reactor vessel and allows microorganisms to feed on the organic fraction of the waste producing a biogas and a solid product that can be turned into compost. The biogas is typically combusted in an engine to produce electrical power.
Autoclave	Mixed solid waste is fed into a vessel where it is subjected to heat, pressure, and agitation causing the organic fraction of the waste (food scraps, fiber/paper, and vegetation) to break down into a pulp-like substance that has energy applications.
Gasification	Segregated waste is fed into a vessel and is indirectly subjected to high heat and a small amount of air. A syngas is produced that has such direct applications as powering a turbine or an internal combustion engine.
Hydrolysis	A technique that can involve acids or enzymes that are mixed with water and the waste in a reactor. These agents break down the waste materials into sugar compounds and a byproduct from the plant fraction known as lignin.
Pyrolysis	Segregated waste is fed into a vessel and is indirectly subjected to high heat. Practically all air is excluded from the reactor vessel resulting in producer gas that contains methane, carbon dioxide, carbon monoxide liquid (oils/tar), and a solid char.

Source: SCS Engineers©

KEY FEASIBILITY QUESTIONS

A waste-conversion project can be one of the most complex public works projects considered by a community. Not unlike traditional, mass burn, WTE facilities, such projects should undergo a methodical feasibility assessment that seeks answers to key questions up-front. This approach will assure the public and the decision makers that all relevant issues have been explored and a resolution reached before significant resources are expended on such projects.

- Does the technology work? Assess: annual operating experience; scale-up issues; need for preprocessing of the waste stream; reliability of disposal.

- What is the strength of the company? Assess: its business strength to secure capital; its intellectual property and patent rights for the technology; patent guarantee.

- Does the project fit with the community's current solid-waste program? Assess: if the new system meshes with the current waste collection, recycling, and disposal program; if a transfer system is needed; if modification of the solid-waste plan is necessary.

- Can you provide waste supply for the project? Assess: legal or economic flow control; whether enough waste can be provided by the community; if waste imports are needed.

- What are the projects siting needs? Assess: if land is available with the proper zoning and setbacks; if needed utilities are available at a reasonable cost; if there is public buy-in for the project.

- What kind of permits will be needed? Assess: air permits, local and state zoning and plan amendments.

- Are markets available for the products and energy? Assess: if there is sufficient information to predict plant outputs from the technology selected; if markets exist for products (i.e., syngas, slag, compost, etc.).

- What are the costs? Assess: calculate the project's short-term and long-term economic impacts through Pro Forma modeling to develop accurate capital and operating costs for the project, to determine if funds are available to cover operating costs; and to determine if tipping fees are required.

- Will there be financing risks? Assess: the role of government agencies in the process; whether taxpayers could be on the hook for risks of loan.

- What happens if system fails? Assess: which local agency would control the solid-waste system; where waste would go if plant had to be shut down; who would be responsible for extra costs incurred in a system failure or extended shutdown.

A WORD ON AGREEMENTS

Often times a developer needs some type of agreement with the municipality to obtain financing or investors for the project. The agreement may include possible arrangements for many of the factors considered herein. These agreements can be one-sided (slanted to the developer) and should be reviewed by your legal adviser.

Some technical consultants also have the experience to provide supplemental assistance to the team with technical conditions (both those that are missing or should be changed or dropped) to ensure provisions are comprehensive, reasonable, and fair to the local government. If an agreement can be postponed until some level of due diligence has been completed, that may strengthen the local government position and possibly reduce some risks.

WHAT'S AHEAD

The market of new waste-conversion technologies is rapidly evolving with new facilities being announced and operating data on pilot facilities beginning to be received to fill in the current gaps with operating history. These developments will eventually make the job of assessing the claims for these technologies more efficient and accurate.

These assessments will also eventually help provide a clear unbiased tool that can be used in working through the decision-making process. By asking the right questions, decision makers can take steps to ensure that what is being promised is what they will receive.

Appendix G
Information on Existing Recycling Facilities

Appendix G, Table G-1 Information on Existing Recycling Facilities

Facility Name	Physical Address	Ownership /Year Start	Contact Info	Materials Accepted	Facility Type	Cities or Counties Served	Current Operational Characteristics	Expansion Potential
Sun bright Paper Recycling	701A Texas Central Pkwy Waco, Texas 76712	Sunbright Disposal Service/Sunbright Paper Recycling Inc; Started in 1976; incorporated in 1999	Kendall Hobby (254) 776-1977	Residential curbside; OCC, mixed paper, office paper, plastics 1-7, industrial-commercial grade plastics, fibers, film, shrink wrap	Single-stream residential curbside, schools, commercial recycling, and collections	Waco, Copperas Cove, Temple, Killeen, Fredericksburg, Itasca, Mexia, Houston, Austin, San Antonio	One single-stream processing, line, other hand-sorting lines, two bailers; Processing line capacity ~20-25 tpd; business/commercial processing 100-110 tpd; single work shift	Single stream up 250 tpd, addition of 2nd shift operations in current structure; ability to add mechanical and electronic sort. Could serve other areas.
M Lipsitz & Co Ltd. also known as Market Street Recycling LLC	10 Locations. Two in Waco: 1800 La Salle Ave. Waco, TX 76706 and 100 Elm Street Waco, TX 76704-2507	M. Lipsitz Started 1933 in Waco, incorporated in 1994	(254) 756-6661	Ferrous metals including, heavy melt, busheling, plate and structural, cast iron turnings; electric motors, car bodies; tin and appliances; non-ferrous, including aluminum, copper, brass, stainless steel and nickel alloys, lead; electronic scrap, including AC adapters/power supplies, batteries, cell phones, network & telecom, computer hardware and circuit boards	Metal recycling and processing	Serves 10 cities including Waco, Brownwood, Bryan, Terrell, Tyler, San Antonio, Houston, Midland, Terrell, Tyler TX and Ardmore, OK	Capabilities including metal shredding, cranes, magnets, hoists, support equipment. Also offers collection services for metals	Has abilities to expand operations according to market demands
CMC Metal	1400 E League Street, **Waco**, TX	Greg Hill	(254) 754-5700	Scrap and Waste Materials, Wholesale Scrap Metals and Iron (254) 756-6661	Metal Recycling and Processing	Serves the Central Texas area from Belton south to Brownwood west and the six county HOTCOG region	Processes scrap, steel, copper, aluminum and lead for use as raw material in CMC mills	Current facilities are capable of handling anticipated volumes
Green Fiber	615 Forrest Dr Waco, Tx	Stephen Haynes	(254) 752-0002	Uses recycled paper to manufacture insulation products	Recycling and Manufacturing	Waco and Central Texas	Receives and processes paper for use in manufacturing insulation products	

Appendix H
Trends in Solid Waste Management

TRENDS IN SOLID WASTE MANAGEMENT

In recent years, many solid waste practitioners and agencies have argued for a new approach to replace the "end of pipe" waste management technologies such as landfilling and waste incineration. This is commonly termed the "materials management" paradigm, which aims at a comprehensive evaluation of how materials are managed upstream of traditional waste management techniques so they can be sustainably managed at all stages of their life cycle throughout the economy (Figure 1). That is, this new paradigm helps address the stages of materials and products from raw material extraction to product design, manufacture and transport, consumption by the consumer, use, reuse, recycling, and then final disposal.

In essence, this new paradigm encourages placing the highest value on source reduction and extended producer responsibility, and then efforts for waste conversion such as energy, biofuels, and compost. In comparison to the traditional waste hierarchy pyramid, which has shown landfills serving as the base of the pyramid, under this paradigm, these waste disposal technologies are considered as an option of "last resort" for those materials that cannot be recovered for beneficial reuse. This new paradigm is broadly based on visions of future solid waste management expressed by both the EPA and the European Union.

Extended Producer Responsibility

Briefly, extended producer responsibility (EPR) is a general policy approach which aims to shift the cost of managing consumer packaging from local solid waste agencies to those manufacturers who are producing these products.

EPR causes producers to change packaging design and selection, leading to increased recyclability and/or less packaging use.

In the United States, more than 70 producer responsibility laws have been promulgated in 32 states including 10 categories of consumer products such as: automobile batteries, mobile phones, paint, pesticide containers, carpet, electronics, thermostats, and fluorescent lamps. In recent years, there has been a rising tide of states which have passed E-waste EPRs as a consequence of the rapid replacement of these products. Several states have enacted landfill bans, which have increased product recycling. However, as of this date, no state has enacted an EPR law of programs extending to packaging or printed paper.

Figure 1. Life Cycle of Materials and Products

Product Stewardship

Product stewardship is a voluntary initiative aimed at restructuring the way manufacturers design and market products so that they optimize recycling of materials, minimize packaging, and actually design their products in a way that will enable complete recycling of the used product in lieu of disposing the used product.

The Product Stewardship Institute (PSI) is a U.S., non-profit membership-based organization, located in Boston. PSI works with state and local government agencies to partner with manufacturers, retailers, environmental groups, federal agencies, and other key stakeholders to reduce the health and environmental impacts of consumer products. PSI takes a unique product stewardship approach to solving waste management problems by encouraging product design changes and mediating stakeholder dialogues. Several states have or are considering initiatives and laws that would encourage or require manufacturers to improve their product designs in this manner.

Product stewardship is a concept designed to alleviate the burden on local governments of end-of-life product management. Product stewardship is a product-centered approach that emphasizes a shared responsibility for reducing the environmental impacts of products. This approach calls on the various waste generators to help minimize their wastes:

- Manufacturers: To reduce use of toxic substances, to design for durability, reuse and recyclability, and to take increasing responsibility for the end-of-life management of products they produce.
- Retailers: To use product providers who offer greater environmental performance, to educate consumers on environmentally preferable products, and to enable consumers to return products for recycling.

- Consumers: To make responsible buying choices that consider environmental impacts, to purchase and use products efficiently, and to recycle the products they no longer need.
- Government: To launch cooperative efforts with industry, to use market leverage through purchasing programs for development of products with stronger environmental attributes, and to develop product stewardship legislation for selected products.

The principles of product stewardship recommend that a role of government is to provide leadership in promoting the practices of product stewardship through procurement and market development. Environmentally Preferable Purchasing (EPP) is a practice that can be used to fulfill this role. EPP involves purchasing products or services that have reduced negative effects on human health and the environment when compared with competing products or services that serve the same purpose. They include products that have recycled content, reduce waste, use less energy, are less toxic, and are more durable.

Local, state, and federal government agencies can and do use their tremendous purchasing power to influence the products that manufacturers bring to the marketplace. In the last decade or so, most efforts have focused on encouraging procurement of products made from recycled content. The goal of these procurement programs is to create viable, long-term markets for recovered materials. The EPA has developed a list of designated products and associated recycled content recommendations for federal agencies to use when making purchases. These are known as Comprehensive Procurement Guidelines.

To date, EPA has developed more than 60 guidelines that fall into the general categories of construction products, landscaping products, non-paper office products, paper and paper products, park and recreation products, transportation products, vehicular products, and miscellaneous products. For example, federal agencies are instructed to buy printing or writing paper that contains at least 30% post-consumer recycled content.

Zero Waste Initiatives

Certain municipalities have investigated and taken on the concept of "Zero Waste". This is currently the most comprehensive all-around way of looking at the concept of source reduction or waste reduction, and there are many sources of information and examples of how a solid waste agency could consider adopting a goal of this type, for advancing waste reduction. It is important to note that "Zero Waste" does not mean that all waste materials will disappear, but that, to the maximum extent possible, source reduction, recycling and waste diversion will have removed all materials that can be utilized in some way. Instead of seeing used materials as garbage in need of disposal, discards are seen as potentially valuable resources. Zero Waste is a "whole system" approach to resource management that maximizes recycling, minimizes waste, reduces consumption and promotes the reuse of products.

Single Stream Recycling

Programs that provide residents and business owner's convenience and ease of use tend to achieve higher recovery rates and operational. The single-stream collection approach was designed to eliminate the need for customers and/or collection crews to sort recyclables curbside.

Communities that have adopted single stream collection programs have achieved significant increases in participation and tonnage recycled. However, single stream collection requires single-stream MRF processing, which requires additional equipment and capital.

As with most solid waste management approaches, each community is different and oftentimes a "one size fits all" solution will not work well with implementation of single stream recycling collection. Implementation for a specific community requires good statistics on the current recycling collection program, the type of new equipment suggested and their capital and operating costs, and the projected ease of transition. The anticipated time to affect the writing and evaluation of a new invitation to bid must be factored into this equation. A good game plan is necessary to help minimize the number of errors and vendor issues. Lastly, a pro-active public education program is essential to inform the public how the program will be rolled out, what materials will be targeted for recycling, when they will receive new equipment, how the program will impact their existing solid waste collection program, and when their new pickup schedule will occur.

E-Waste Collection

Electronic wastes or "E-waste" represent a notable challenge affecting communities today. Common practices for collecting e-waste include community "roundups" held once or twice a year. Many larger communities accept self-hauled e-waste at their transfer stations or disposal sites year round. Donating used electronics for reuse extends the lives of valuable products. Recycling electronics prevents valuable materials from going into the waste stream. Consumers in many communities now have many options to recycle or donate for reuse of their used electronics. Computer, TV, and cell phone manufacturers, as well as electronics retailers in certain areas offer some kind of take back program or sponsor recycling events.

In New York State, the Electronic Equipment Recycling and Reuse Act (Article 27, Title 26 of the Environmental Conservation Law) was signed into law by the Governor on May 28, 2010. The New York law ensures that every New Yorker will have the opportunity to recycle their electronic waste in an environmentally responsible manner. The New York law requires manufacturers to implement and maintain an acceptance program for the discarded electronic waste. The manufacturers must provide for the convenient collection, handling and recycling or reuse of electronic waste via at least one reasonably convenient method of collection within each county, and within each municipality with a population greater than 10,000 at no cost to the consumer.

Other states in the northeast United States that also have extended producer responsibility laws in effect include Connecticut, Rhode Island, New Jersey and Maine. These laws have lead to the formation of collectives which represent groups of manufacturers that provide the collection and/or recycling on behalf of the manufacturers.

In summary, best management practices for E-waste include the following activities:

1. Publication and dissemination of information (including via the internet) about E-waste, including the donation and reuse options or drop off and mail in programs.

2. Periodic collection or drop-off at licensed facilities.

3. Availability of additional information that may be needed or requested for making proper disposal decisions.

4. Encouragement for local companies and merchants to provide product recycling or take-back opportunities.

Organic Wastes

The organic fraction of the MSW waste stream, which includes food scraps, yard waste, wood waste, and mixed paper, represents about 40 to 60 percent by weight. Multi-family residential units do not generate yard waste and wood packaging, so organic wastes are significantly lower, 15 to 20 by weight.

According to the U.S. EPA, Americans generated nearly 35 million tons of food waste in 2010, with 97 percent of it disposed at landfills. To address this, communities in certain parts of the U.S., in recent years have been evaluating options to handle organics beyond the traditional approach in just supplying information on municipal web sites about the benefits of backyard composting. Further, certain state governments have begun promulgating policies and regulations that target the recycling of organics prompting local solid waste agencies to develop advanced municipal curbside collection programs.

A key question for the local solid waste agency to answer is what types of organic wastes will be targeted for collection and processing. For example, some programs accept food wastes, but do not collect meat or fish wastes due to significant odor and processing issues. The plastic lining in some disposal cups, as well as in coated paperboard products, can pose a contaminant problem for composters. Also, other programs restrict the collection of pet wastes and diapers due to contamination concerns. The paragraphs below briefly discuss some of facets of these organics recycling initiatives.

Drop Off Programs

Historically, many rural and smaller communities where residents already self-haul refuse, yard waste drop-off can be a cost-effective way to recover a significant amount of organics. Residents who can conveniently haul their yard clippings and other organic wastes to a nearby drop box will participate at levels similar to curbside collection systems. Also, mobile drop-off centers can help serve a number of adjacent communities, especially if these centers offer reduced or free tipping fees for source-separated organics. Food waste collection at drop-off centers has oftentimes proven a bit more complicated than recycling because the materials cannot sit around as long as stacks of newspapers, but a convenient network of community locations can overcome the barriers to frequent drop-offs by residents.

Bulk Collection

Another simple collection system for organics is for residents to rake their yard clippings, leaves, and brush into piles on the edge of the curb. Trucks with vacuum equipment can then remove the piles and haul them away. If vacuum equipment is unavailable, the piles must be placed in

the street so loaders or sweepers can get access to the piles to remove them. Most local governments have dump trucks and loaders and consider this option a less expensive method to implement a yard waste collection program.

Piles of yard waste in the street could cause traffic problems as well as plugging municipal storm drains. Wet yard wastes piled in this manner could also produce unpleasant odors.

This method of collection could easily be implemented because it does not require any more effort on behalf of the participants than what is normally expended taking care of their yards. But, the various negative issues introduced with this method would require careful consideration by decision-makers before implementing.

Curbside Collection Programs

According to a 2013 survey in the United States, there are more than 214 source-separated organics collection programs in operation and the effort is gaining traction in recent years. That number is up from only 20 programs in 2005. These programs each have their own method for food waste collection. The trends for both the residential and multi-family sectors are being assessed, as these programs continue to be refined across the U.S.

NSPS Rule Changes

Federal New Source Performance Standard (NSPS) rules (40 CFR 60, Subpart WWW) are the main driver for whether landfills must install gas collection and control systems. These rules have been in place, with minor changes, since the mid 1990s. In 2014, the United States Environmental Protection Agency is expected to issue proposed revisions to this rule. Based on preliminary information, it is likely that the rules will become more restrictive on landfills, either by making smaller landfills subject to control requirements, or by making landfills with gas systems meet more aggressive requirements for expansion or monitoring. There will be a lag between the 2014 proposed rules and when finalization occurs. Also, in the past proposed rule changes have not been finalized. However, these changes will be important for landfill owners to track and consider.

Greenhouse Gas Air Permitting Changes

In 2010 the United States Environmental Protection Agency promulgated Greenhouse Gas (GHG) permitting rules which impact landfills. These rules have not undergone significant revisions since that time. However, methane had been the sole pollutant of interest for landfills in the past, with carbon dioxide as being essentially treated as neutral with respect to permitting. Due to a court case earlier in 2013, this may change in the future. Although the issue is still not resolved, and rules may be put into place to keep carbon dioxide as neutral, this could have a very large impact on landfills. The impact on landfills could be large since methane can be destroyed in a flare or other device, but carbon dioxide cannot. The bottom line is that if carbon dioxide is treated similarly with methane for GHG permitting purposes, many more landfills may be subject to GHG permitting. This issue bears watching for all landfill owners in the near future.

Alternate Final Cover Design Demonstrations

In Texas as well as other states, implementation of the provisions of the U.S. Environmental Protection Agency's rule governing the demonstration the adequacy of an alternate final cover is under review and reconsideration. In particular, in Texas, various stakeholders from the public and private sectors are collaborating in sponsoring a state-wide demonstration program in evaluating a potentially streamlined mechanism for requesting the approval of the Texas Commission on Environmental Quality (TCEQ) for an alternative final cover. The results of this study, which is being led by Milind V. Khire, Ph.D., P.E., an Associate Professor of Geotechnical & Geoenvironmental Engineering at Michigan State University, will be available in 2014. At that time, an assessment can be made regarding the applicability of the results to the landfills serving the HOTCOG region.

Landfill Post-Closure Period

Current rules of the EPA and the TCEQ require a minimum 30-year post-closure (PC) period. During the service life of Subtitle D landfills, landfill owners are required by TCEQ rules to establish financial assurance to cover the cost of not only landfill closure, but also post-closure for the prescribed post-closure period. While it is understood that the 30-year PC period may be unnecessarily long for some landfills and not sufficient for others, to date, the EPA has not provided any guidance on how to assess requests for alternate PC periods. To address this need for background technical data in support of such guidance, the Solid Waste Association of North America is sponsoring research to address this matter. Furthermore, SWANA's Landfill Management Technical Division (LMTD) has established a technical committee to monitor technical developments on this topic. Note: Kevin Yard, SCS' Project Manager for this project, is currently serving as the Director of the LFMTD and, as such, can be contacted to provide updates on this matter.

Appendix I
Glossary of Terms

AERATION The process of exposing bulk material, such as compost, to air.

AEROBIC A biochemical process or condition occurring in the presence of oxygen.

ANAEROBIC A biochemical process or condition occurring in the absence of oxygen.

ANAEROBIC DIGESTION means the controlled biological breakdown of biodegradable organic matter in the absence of oxygen.

BALER A machine used to compress recyclables into bundles to reduce volume.

BIODEGRADABLE MATERIALS means waste material which is capable of being broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Most organic wastes, such as food remains and paper are biodegradable.

BIOGAS is a gas produced through anaerobic digestion and is primarily composed of methane and carbon dioxide, but also may contain impurities such as hydrogen sulfide.

BIOMASS Amount of living matter in the environment.

BRITISH THERMAL UNIT This is a unit of measure for the amount of energy a given material contains as energy is released as heat during the combustion. One Btu is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

BUY BACK CENTER A facility where individuals bring recyclables for payment.

BIOSOLIDS means solids derived from primary, secondary or advanced treatment of domestic wastewater which has been treated through one or more controlled processes that significantly reduce pathogens and reduce volatile solids or chemically stabilize solids to the extent that they do not attract vectors.

CAPITAL COSTS Those direct costs incurred to acquire real property assets such as land, buildings, machinery, and equipment.

COLLECTION ROUTES Established routes followed in the collection of refuse and recyclables from homes, businesses, commercial plants, and other locations.

COLLECTION SYSTEM means the total process of collecting and transporting solid waste. It includes storage containers, collection crews, vehicles, equipment, and management and operating procedures.

COMMERCIAL WASTE is waste materials originating in wholesale, retail or service establishments such as office buildings, stores, markets, theaters, hotels, and warehouses.

COMPOST is relatively stable decomposed organic material; the result of the composting process.

COMPOSTING is the controlled biological decomposition of organic solid waste under aerobic conditions.

COMPOSTING FACILITY means a site or facility composting feedstocks to produce a useful product through a managed process of controlled biological decomposition. Examples of composting facilities include sites used to composting windrows and piles, anaerobic digestion, vermiculture, vermicomposting and agricultural composting.

CONSTRUCTION AND DEMOLITION WASTE These are waste building materials, packaging, and rubble resulting from construction, remodeling, and demolition operations on pavements, houses, commercial buildings, and other structures. These kind of materials usually include used lumber, metal parts, packaging materials, boxes, sheet metal, and other materials.

CONVERSION TECHNOLOGY FACILITY means a facility that uses primarily chemical or thermal processes (changing from solid to liquid through heating without changing chemical composition) to produce fuels, chemicals, or other useful produces from solid waste. These chemical or thermal processes include, but are not limited to, distillation, gasification, hydrolysis, pyrolysis, thermal depolymerization, transester-ification and animal rendering, but do not include direct combustion, composting, anaerobic digestion, melting, or mechanical recycling. Mills that primarily use mechanical recycling or melting to recycle materials back into similar materials are not considered to be conversion technology facilities, even if they use some chemical or thermal processes in the recycling process.

CONSTRUCTION AND DEMOLITION WASTE (C&D) means building materials waste, dredging materials, grubbing waste and rubble from construction, remodeling, repair or demolition of buildings, bridges, pavements and other structures.

COST Everything given up to acquire a material or service, or achieve a goal.

COST SAVINGS The monetary savings realized through waste reduction and recycling as a result of avoiding landfill or other disposal processes; sometimes referred to as "avoided cost".

CONVERSION TECHNOLOGY The use of chemical or thermal processes to convert solid waste to fuels or other similar useful products. These technologies include the following: pyrolysis, gasification, anaerobic digestion, hydrolysis, and distillation.

CULLET Clean, generally color sorted, crushed glass used to make new glass products.

CURBSIDE COLLECTION Collection of recyclable materials at the curb, often from special containers, to be taken to various processing facilities.

DIGESTATE means both solid and liquid substances that remain following anaerobic digestion of organic material in a composting facility. "Solid digestate" means the solids resulting from anaerobic digestion, and "liquid digestate" means the liquids resulting from anaerobic digestion.

DIRTY MATERIALS RECOVERY FACILITIES A facility that accepts a mixed waste stream and then proceeds to separate our designated recyclable materials through a combination of manual and mechanical sorting.

DISPOSAL These are activities associated with the long-term handling of solid waste that are collected and are no further use.

DIVERSION RATE A measure of the amount of waste material being diverted for recycling compared with the total amount that was previously thrown away.

DOWNSTREAM Those actions and impacts that occur after that point in the life cycle, at any point on a product's life cycle.

DROP-OFF CENTER A method of collecting recyclable or compostable materials in which the materials are taken by individuals to collection sites and deposited into designated containers.

DUAL-STREAM RECYCLING Recycling processes in which the waste streams are separated at a materials recovery facility. One stream is usually fiber and the other containers.

END-OF-LIFE The point at which a product or material is no longer useful to the person possessing it and is either discarded or abandoned.

ENERGY RECOVERY means recovery in which all or a part of the solid waste materials are processed to use the heat content, or other forms of energy, of or from the material. Energy recovery includes the direct combustion of solid waste in an energy recovery facility and the production of fuels intended to be burned as an energy source, such as the pyrolysis of plastics to produce fuel oils or the grinding of wood waste to produce combustion fuel.

ENERGY RECOVERY FACILITY means a facility that directly combusts solid waste and uses the heat energy generated for some useful purpose such as produce electricity or to produce steam to be used in an industrial process.

ENTERPRISE FUND A fund for specific purpose that is self-supporting from the revenue it generates.

EXTENDED PRODUCER RESPONSIBILITY (EPR) A mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for the product extends to post-consumer management of that product and its packaging.

E-WASTE means a computer, computer monitor, and computer peripheral, device containing a cathode ray tube, printer, or television.

FERROUS METALS Pertaining to, or derived from, iron; often used to refer to materials that can be removed from the waste stream by magnetic separation.

FINANCIAL ASSURANCE means a plan for setting aside financial resources or otherwise assuring that adequate funds are available to properly close and to maintain a monitor a disposal site after the site is closed according to the requirements of a permit issued by the department.

FLOW CONTROL A legal or economic means by which waste is directed to particular destinations.

FOOD WASTE Animal or vegetable wastes resulting from the handling, storage, sale, preparation, cooking and serving of foods.

FRONT-END SYSTEM A process for salvaging certain reusable materials from the waste before combustion or other processing.

FRONT-END LOADER A collection vehicle with arms that engage a detachable container, move it up over the cab, empty it into the vehicle's body, and return it to the ground.

FRONT-END RECOVERY is the mechanical processing of as discarded solid wastes into separate constituents.

GARBAGE Spoiled or waste food that is thrown away, generally defined as wet food waste; although in common usage garbage refers to all materials that are discarded as unnecessary.

GENERATION is the act or process of producing solid waste.

GLASS An inorganic product of fusion that has cooled to a rigid condition without crystallizing.

GRADE A term applied to a paper or pulp which is ranked on the basis of its use, appearance, quality, manufacturing history, raw materials, performance, or a combination of these factors.

GREENWASHING The practice of making an unsubstantiated or misleading claim about the environmental benefits of a product, service, or technology.

GREEN WASTE A combination of non-animal food and yard waste collected and composted together.

HAMMERMILL A type of crusher used to break up waste materials into smaller pieces or particles, which operates by using rotating and failing heavy hammers.

HAZARDOUS WASTE means discarded, useless or unwanted materials or residues and other wastes that are defined as hazardous waste.

HDPE High density polyethylene, a plastic resin used to make items such as plastic milk and detergent containers, and base cups for plastic soft drinks.

HIGH GRADE PAPER Relatively valuable types of paper such as computer printout, white ledger, and tab cards.

HOUSEHOLD HAZARDOUS WASTE is any waste from households, hotels or motels, bunkhouses, ranger stations, crew quarters, camp grounds, picnic grounds, and day-use recreation areas that would be subject to regulation as hazardous wastes if it were not from households.

INCINERATOR means any device used for the reduction of combustible solid wastes by burning under conditions of controlled airflow and temperature.

INDUSTRIAL WASTE Those waste materials generally discarded from industrial operations or derived from manufacturing processes.

INFECTIOUS WASTE means biological waste, cultures and stocks, pathological waste, and sharps.

INSTITUTIONAL WASTE Solid wastes generated by schools, hospitals, universities, museums, governments, and other institutions. Some communities define institutional solid waste as commercial solid waste.

INTEGRATED SOLID WASTE MANAGEMENT A practice of disposing of solid waste using several complementary components, such as waste reduction, recycling, composting, energy recovery, and landfilling.

IN-VESSEL COMPOSTING A composting method in which the compost is continuously and mechanically mixed and aerated in a large, contained area.

INTERMEDIATE PROCESSING CENTER A type of materials recovery facility (MRF) that processes residentially collected mixed recyclables into new products available for market; often used interchangeably with MRF. An acronym is IPC.

INVESTMENT TAX CREDIT A reduction in taxes permitted for the purchase and installation of specific types of equipment and other investments.

JUNK Old or scrap metals, rope, rags, batteries, paper, rubber, junked, dismantled or wrecked automobiles or parts thereof which are not held for sale for remelting purposes; unprocessed materials suitable for reuse or recycling, commonly referred to as secondary materials.

KRAFT PAPER A paper made predominantly from wood pulp produced by a modified sulfate pulping process. It is a comparatively coarse paper particularly noted for its strength; in unbleached grades is used primarily as a wrapper or packaging material.

LANDFILL means a facility for the disposal of solid waste involving the placement of solid waste on or beneath the land surface.

LEACHATE means liquid that has come into direct contact with solid waste and contains dissolved, miscible and/or suspended contaminants as a result of such contact.

LIFE CYCLE ASSESSMENT (LCA) A standardized process used to estimate the impact that a product or process has over the whole of its lifespan, including extraction of raw materials, production, transport, use, and disposal.

MAGAZINE PAPER A variety of coated and uncoated papers used in magazines and similar periodicals.

MAGNETIC SEPARATION A system used to remove ferrous metals from other materials through the use of magnets.

MANDATORY RECYCLING Programs requiring by ordinance or statute that residents or businesses keep specific materials from their solid wastes.

MANILA PAPER Indicates color and finish and not the use of manila hemp.

MANUAL SEPARATION is the separation of recyclable materials from waste by hand sorting.

MATERIALS MANAGEMENT An approach to reduce environmental impacts by managing through all stages of their life. Materials management identifies impacts and actions across the full cycle of materials and products as they move through the economy – from raw material extraction to product design and manufacture, transport, consumption, use, reuse, recycling, and disposal.

MATERIALS RECOVERY FACILITY A common acronym is MRF.

MATERIALS RECOVERY The concept of resource recovery, emphasis is on separating and processing waste materials for beneficial use or reuse.

MAXIMUM RECYCLING POTENTIAL The maximum amount of recycling possible for a community given an ideal market, regulatory, citizen participation, and technological limits. MRP is sometimes used as an acronym.

MECHANICAL SEPARATION means the separation of waste into various components using mechanical means, such as cyclones, trommels, and screens.

MIXED KRAFT BAGS consists of baled used kraft bags free from twisted or woven stock and other similar objectionable materials.

MSW COMPOSTING means mixed or Municipal Solid Waste Composting, the controlled degradation of municipal solid waste including some form of presorting to remove non-compostable inorganic materials.

MULCH Ground or mixed yard wastes placed around plants to prevent evaporation of moisture and freezing of roots and to nourish the soil.

MUNICIPAL COLLECTION is the collection of solid wastes by a public agency.

MUNICIPAL SOLID WASTE Includes non-hazardous waste generated in households, commercial and business establishments, institutions, and light industrial wastes; it excludes industrial process wastes, agricultural wastes, mining wastes, and sewage sludge.

NEWSPRINT A generic term used to describe paper of the type generally used in the publication of newspapers.

NIMBY Acronym for "Not In My Backyard"; expression of opposition to the siting of a facility based on the particular location proposed.

NONFERROUS METAL Metals which contain no iron, such as aluminum, copper, brass, and bronze.

ORGANIC WASTE is waste material from substances composed primarily of chemical compounds of carbon in combination with other elements, primarily hydrogen. These materials include paper, wood, food wastes, plastics, and yard waste.

PACKER TRUCK Type of solid waste collection vehicle used for residential collection that compacts refuse into high density masses for maximum collection efficiency. It can incorporate a rear loading or top loading device.

PAPER The name for all kinds of matted or felted sheets of fiber formed on a fine screen for a water suspension.

PARTICIPATION RATE A measure of the number of people participating in a recycling program compared to the total eligible.

PATHOGEN is an organism capable of producing disease.

PER CAPITA DISPOSAL RATE means the average amount of waste disposed (landfill or incinerated) per person per year for a given year.

PET Polyethylene terephthalate, a plastic resin used to make packaging, commonly used to make plastic soft drink bottles.

PLASTICS Non-metallic compounds that result from a chemical reaction, and are molded or formed into rigid or pliable construction materials and fabrics.

POLYPROPYLENE is heavy-duty plastic.

POLYSTYRENE A hard, dimensionally stable thermoplastic that is easily molded.

POLYVINYL CHLORIDE A common plastic material which is tasteless, odorless, and generally insoluble; acronym is PVC.

POST CONSUMER RECYCLING The reuse of materials generated from residential and commercial waste, excluding recycling of material from industrial processes that has not reached the consumer, such as glass broken in the manufacturing process.

PRICE PREFERENCE A means by which an incentive is provided to purchase recycled goods even if they are more expensive than non-recycled goods.

PROCESSING OF WASTES means any technology designed to change the physical form or chemical content of solid waste including, but not limited to, baling, composting, classifying, hydropulping, incinerating and shredding.

PULPING means the operation of reducing a cellulosic raw material into a pulp suitable for further processing into paper.

PUTRESCIBLE WASTE means solid waste containing organic material that can be rapidly decomposed by microorganisms, and which may give rise to foul smelling, offensive products

during such decomposition or which is capable of attracting or providing food for bids and potential disease vectors such as rodents and flies.

RECYCLED MATERIAL is material that can be utilized in place of a raw or virgin material in manufacturing a product and consists of materials derived from post-consumer waste, industrial scrap, material derived from agricultural wastes or other items, all of which can be used in the manufacture of new products.

RECYCLING Specifically separating a given waste material from the waste stream and processing it so that it may be used again as a raw material for products which may or may not be similar to the original.

RECYCLING CENTER A place where people bring items to be recycled.

RECYCLING RATE is the quantity of material recycled compared to the sum of recycled and disposed material.

RESIDENTIAL WASTE means waste materials generated in single and multiple family homes; when multiple family units exceed four, these wastes are usually collected in large containers by commercial haulers.

RESIDUE means materials remaining after processing, composting, and recycling.

RESOURCE RECOVERY means the process of obtaining useful material or energy from solid waste and includes energy recovery, material recovery, and recycling.

REUSE means the return of a commodity into the economic stream for use in the same kind of application as before without change in its identity.

ROLL-OFF CONTAINER A steel box with wheels used to collect waste at a site, such as a construction site, that can be rolled onto a truck using a winch and then taken to a disposal facility for discharge. The empty container can then be trucked to another site and rolled off the truck for stationary waste collection.

RUBBER A natural or synthetic elastic material comprised of polymers. Chemical treatment can enhance properties required for tires, shoes, insulation, and other products.

RUBBISH is non-putrescible solid wastes, including ashes, consisting of both combustible and noncombustible materials, such as paper, cardboard, tin cans, wood, glass, bedding, crockery or litter of any kind.

SALVAGE means the controlled removal of reusable, recyclable or otherwise recoverable materials from solid wastes at a solid waste disposal site.

SCALEHOUSE A building located at the entrance of a recycling or disposal facility where weigh scales is placed.

SCAVENGER One who illegally removes materials at any point in the solid waste system. It is an alternate name for waste hauler or carter.

SCRAP Discarded or rejected industrial waste material suitable for reprocessing.

SECONDARY MATERIALS are materials that are used in place of a primary or raw material in manufacturing a product, often handled by dealers and brokers in "secondary markets".

SHREDDER A size reduction machine which tears or grinds materials to a smaller and more uniform particle size. Shredding processes are also called size reduction, grinding, milling, comminution, pulverization, hogging, granulating, breaking, macerating, chipping, crushing, cutting, rasping.

SINGLE-STREAM RECYCLING A recycling process where the recycling stream is fully commingled in one bin for collection curbside. These materials are then transported to a single-stream MRF.

SMALL QUANTITY GENERATOR A generator who produces less than 100 kilograms of hazardous waste per month (or accumulates less than 100 kilograms at any one time) or one who produces less than 1 kilogram of acutely hazardous waste per month (or accumulates less than 1 kilogram of acutely hazardous waste at any one time).

SOLID WASTE A general term for discarded materials destined for disposal, but not discharged to a sewer or the atmosphere. Solid waste(s) can be composed of a single material or a heterogeneous mix of various materials including semi-solids.

SOLID WASTE DISPOSAL means the disposal of all solid wastes through landfilling, incineration, composting, chemical treatment, and any other method which prepares solid wastes for final disposition.

SOLID WASTE MANAGEMENT A planned program for effectively controlling the generation, storage, collection, transportation, processing and reuse, conversion or disposal of solid waste in a safe, sanitary, aesthetically acceptable, environmentally sound and economic manner. It includes all administrative, financial, environmental, legal, and planning functions, as well as the operational aspects of solid waste handling and resource recovery systems.

SOURCE REDUCTION The design, manufacture, acquisition, and reuse of materials including products and packaging, so as to minimize the quantity and/or toxicity of waste produced. Source reduction prevents waste either by redesigning products or by otherwise changing societal patterns of consumption, use, and waste generation.

SOURCE SEPARATION is the segregation of specific waste materials at the point of discard for separate collection.

SPECIAL WASTES Hazardous wastes by reason of their pathological, explosive, radioactive, or toxic nature.

SPECIFICATION means clear and accurate description of the technical requirement for materials, products or services. It specifies the minimum requirement for quality and construction of materials and equipment necessary for an acceptable product in the form of written descriptions, drawings, commercial designations, industry standards, and other descriptive references.

STATIC PILE SYSTEM A windrow composting method in which air ducts are generally installed under or in the base of compost piles so air can be blown into or drawn through the pile.

SUBTITLE D That portion of RCRA dealing with non-hazardous solid waste treatment, storage, and disposal facilities.

SUSTAINABILITY Using, developing, and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic, and community objectives.

THERMOPHILES Bacteria or other microorganisms which grow best at temperatures of roughly 45 to 60 degrees C.

TIN CAN Made from tin-plated steel.

TIPPING FEE is the charge to unload waste materials at a transfer station, processing plant, landfill, or other disposal site.

TIPPING FLOOR Unloading area for vehicles that are delivering waste materials to transfer stations, incinerators, or other processing plants.

TONS PER DAY usually refers to the capacity of a paper mill, refuse processing plant, landfill, etc.

TRANSFER TRAILER A vehicle used to transport large quantities of waste over long distances.

TRANSFER STATION Supplemental transportation systems, an adjunct to route collection vehicles to reduce haul costs or add flexibility to the operation. Typically route vehicles empty into a large hopper from which large semitrailers, railroad gondolas, or barges are filled. There may be some compaction of refuse. Transfer stations may be fixed or mobile, since the larger compacting collection vehicles can serve this function.

TRASH Material considered worthless, unnecessary or offensive that is usually thrown away; generally defined as dry waste material, but in common usage it is a synonym for garbage, rubbish, or refuse.

TROMMEL A large revolving cylindrical screen used as a waste separation technique.

TUB GRINDER Machine used to grind or chip wood wastes for mulching, composting, or size reduction.

VARIABLE CAN RATE A charge for solid waste services based on the volume of waste generated measured by the number of containers set out for collection.

VEGETATIVE WASTES Plant clippings, prunings, and other discarded material from yards and gardens. Also known as yard rubbish or yard waste.

VERMICOMPOSTING means the controlled and managed process by which live worms convert solid waste into dark, fertile, granular excrement.

VERMICULTURE means the raising of earth worms for the purpose of collecting castings for composting or enhancement of a growing medium.

VOLUME REDUCTION The processing of waste materials so as to decrease the amount of space the materials occupy, usually by compacting or shredding (mechanical), incineration (thermal), or composting (biological).

WASTE means useless, unwanted, or discarded material resulting from natural community activities. Wastes include solids, liquids, and gases. Solid wastes are classified as refuse.

WASTE EXCHANGE A computer and catalog network to redirect waste materials back into the manufacturing process by matching companies generating specific wastes with companies that use those wastes as manufacturing inputs.

WASTE PROCESSING is an operation such as shredding, compaction, composting, or incineration, in which the physical or chemical properties of wastes are changed.

WASTE PAPER Is any paper or paper product which has lost its value for its original purpose and has been discarded. The term is most commonly used to designate paper suitable for recycling, as paper stock.

WASTE REDUCTION The practice of producing smaller quantities of disposable waste. Waste reduction usually entails changing manufacturing processes and packaging practices to foster more recycling and less dependency on disposable goods.

WASTE STREAM The waste output of a region, community, or facility.

WHITE GOODS Discarded kitchen and other large, enameled appliances, as washing machines and refrigerators.

WHITE PAPER Printers term of unprinted paper, even if colored.

WINDROW Composting material stacked in a triangular prism shape.

WINDROW SYSTEM is a composting technique in which waste is placed in either aerated static piles or turned, windrowed piles to digest.

WOOD FIBER Elongated, thick-walled cells of wood, commonly called "fiber".

WOOD PULP A fibrous raw material derived from wood for use in most types of paper manufactured by mechanical or chemical means both from hardwood and softwood trees.

YARD WASTE Leaves, grass clippings, prunings, and other natural organic matter discarded from yards and gardens.