The Importance of Waste Sorts for Transforming Waste to Resource

Lessons Learned from Fayetteville, NC

Eric Weiss
Consultant I
Gershman, Brickner & Bratton, Inc.

September 25, 2015

1

Outline

- Fundamentals of Transforming Waste to Resource
- The Importance of Waste Sorts as a Planning Tool
- Fayetteville Waste Sort Description and Data Analysis
- Fayetteville Findings and Recommendations
- Conclusions

2

TRANSFORMING WASTE TO RESOURCE

SOLID WASTE MANAGEMENT CONSULTANTS

3

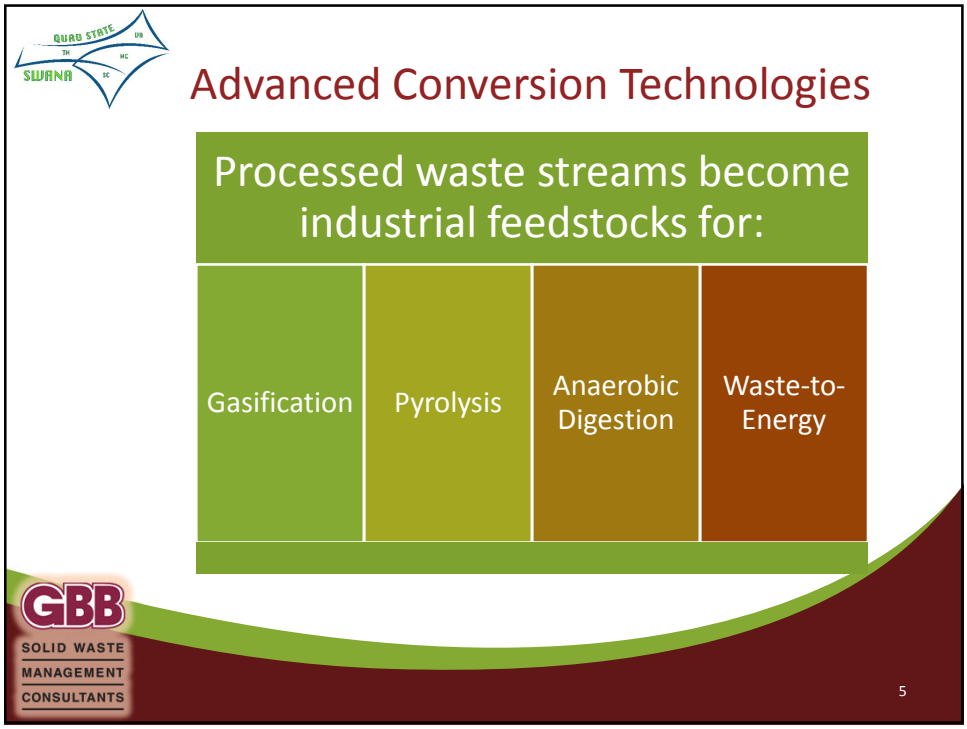
Reduce, Reuse, Recover, Dispose

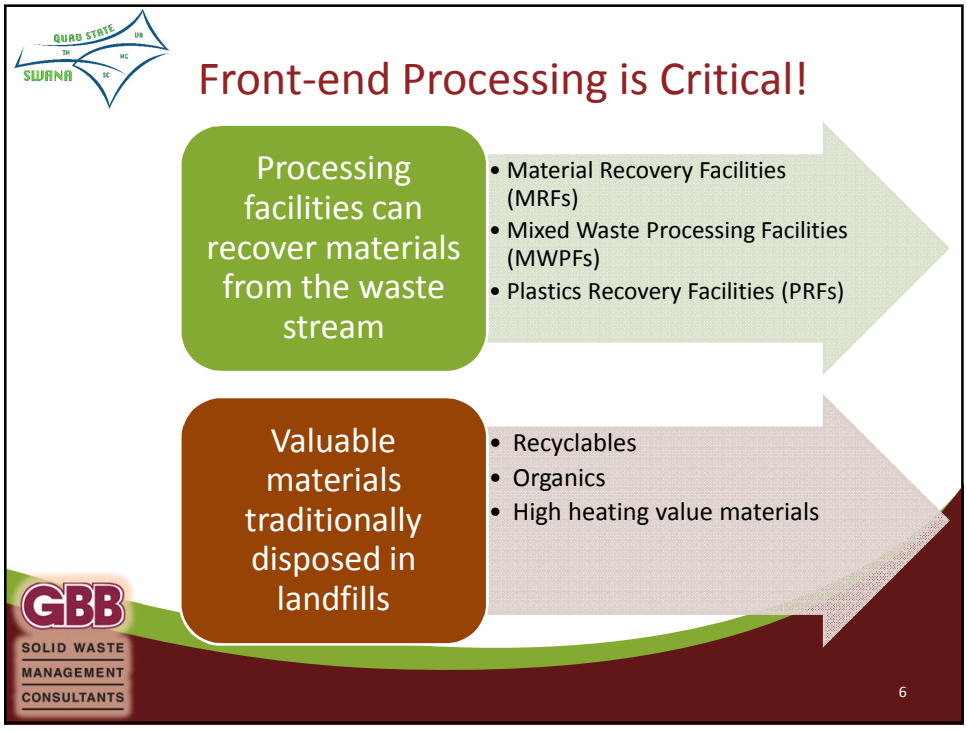
Source: U.S. EPA

- Find the highest and best use
- Segregate recyclables/compostables
- Electrical/Chemical energy recovery
- Dispose at Landfill

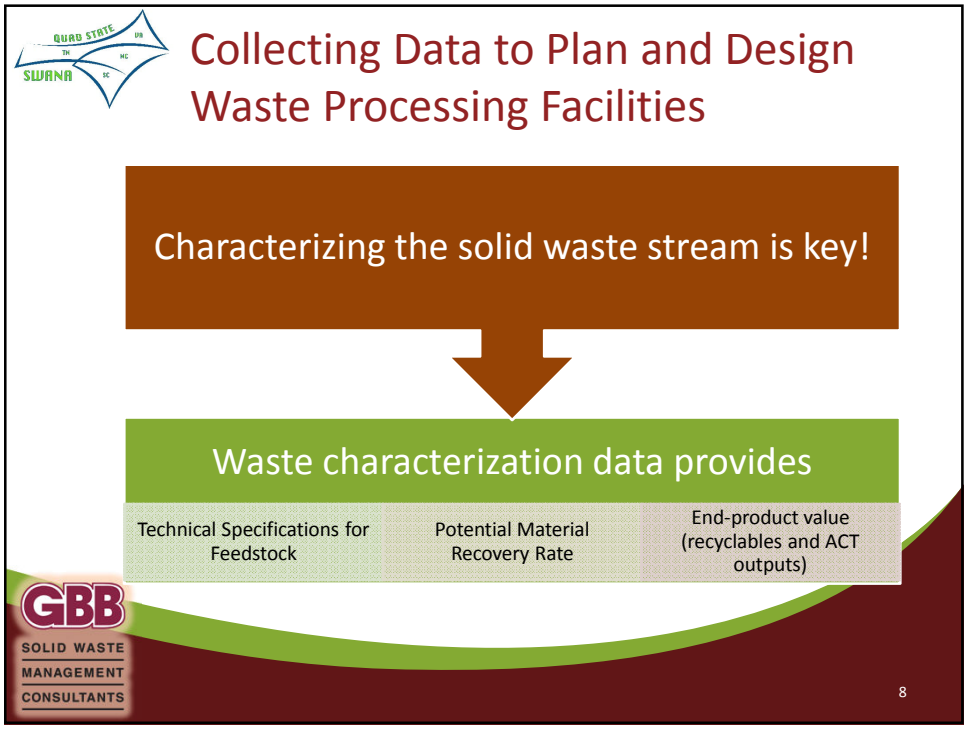
SOLID WASTE MANAGEMENT CONSULTANTS

4


QUAD STATE
SWANA
Advanced Conversion Technologies
Processed waste streams become industrial feedstocks for:
Gasification
Pyrolysis
Anaerobic Digestion
Waste-to-Energy
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
5


QUAD STATE
SWANA
Front-end Processing is Critical!
Processing facilities can recover materials from the waste stream
• Material Recovery Facilities (MRFs)
• Mixed Waste Processing Facilities (MWPFs)
• Plastics Recovery Facilities (PRFs)
Valuable materials traditionally disposed in landfills
• Recyclables
• Organics
• High heating value materials
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
6


PLANNING BEFORE PROCESSING – START WITH A SORT
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
7


Collecting Data to Plan and Design Waste Processing Facilities
Characterizing the solid waste stream is key!
Waste characterization data provides
Technical Specifications for Feedstock
Potential Material Recovery Rate
End-product value (recyclables and ACT outputs)
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
8

Fayetteville Observer – April 28, 1999

"A few years ago, Cumberland and two other counties decided to merge resources and contract with a corporation that would turn waste into steam and electricity….

…It was a sensible plan and ***seemed a no-lose deal*.*** The project was named BCH Energy for the counties involved in the project (Bladen, Cumberland and Hoke) and ground was broken in 1993"

*Bold/Italics added by Eric Weiss

9

Fayetteville Observer – April 28, 1999

"Except, however, that the project turned out to be an all-lose deal. The president of VEDCO Energy of Houston had assured… that the equipment… had worked elsewhere…

By 1996, BCH Energy folded, the original investment was lost, equipment was sold for hardly more than scrap, … [and] Cumberland County… ***had to expand its Ann Street landfill*"***

*Bold/Italics added by Eric Weiss

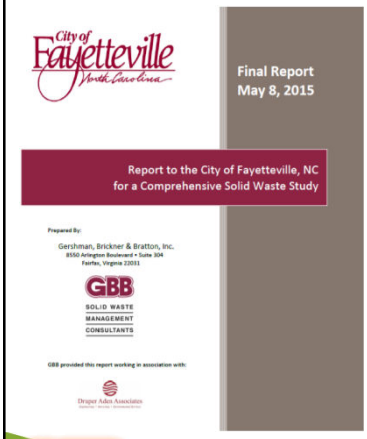
10

FAYETTEVILLE, NC WASTE CHARACTERIZATION STUDY

GBB SOLID WASTE MANAGEMENT CONSULTANTS

11

Fayetteville, NC Comprehensive Solid Waste Study

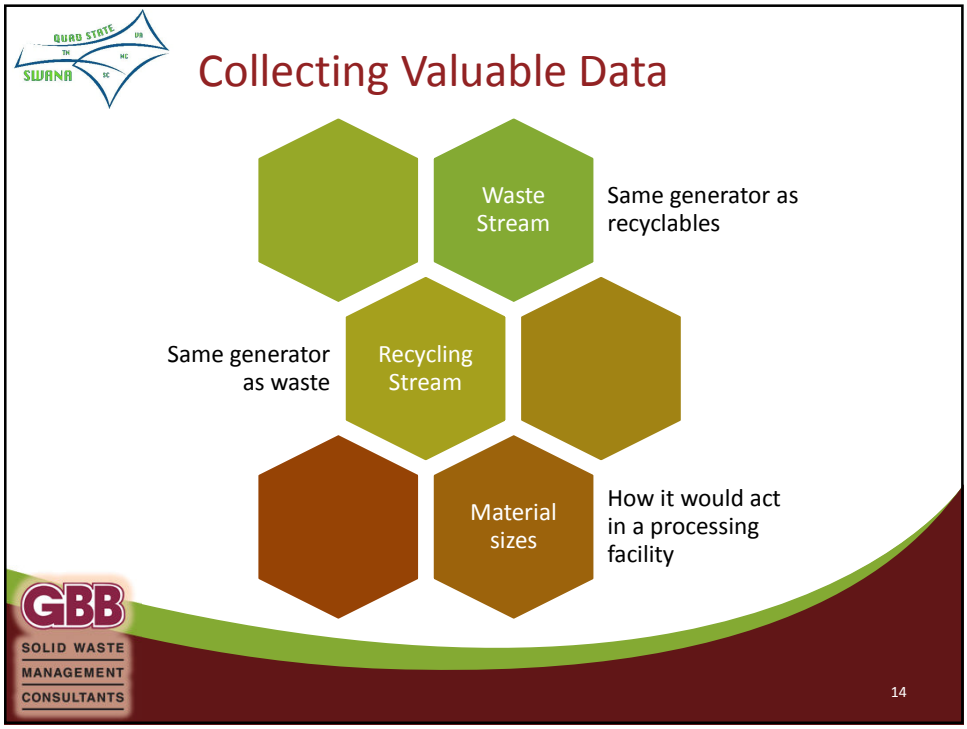


- Contracted with the City of Fayetteville, NC to develop a Comprehensive Solid Waste Management Study
- Conducted a one week "snapshot" sort March 23-27, 2015 (Mon-Fri)
- Analyzed solid waste collection and disposal services offered by the City of Fayetteville and Cumberland County
- Presented findings and recommendations to the City's elected officials

GBB SOLID WASTE MANAGEMENT CONSULTANTS

12


Executing a Waste Characterization
Characterization Protocol & Health and Safety Plan
Unique to each waste sort – GBB used "targeted" methodology for City of Fayetteville
Field work
Data analysis
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
13


Collecting Valuable Data
Waste Stream
Same generator as recyclables
Same generator as waste
Recycling Stream
Material sizes
How it would act in a processing facility
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
14

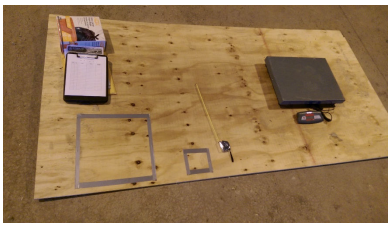
Fayetteville, NC Material Categories

Category	Sort Material List	#
Paper	Newsprint	1
	Office Paper	2
	Corrugated Cardboard, Kraft Paper	3
	Paperboard	4
	Other Dirty Paper	5
Plastic	PET	6
	HDPE	7
	Polystyrene	8
	LDPE	9
	Other Rigid Plastic	10
	Mixed Dirty Plastic	11
Glass	Clear	12
	Green	13
	Brown	14
	Blue	15
	Other	16
Metals	Ferrous	17
	Non-Ferrous	18
Organics	Yard Waste	19
	Food Waste	20
	Misc. Organics	21
Special Wastes	Rubber	22
	Textiles	23
	HHW	24
	Tires	25
	Appliances & Batteries	26
	Used Oil	27
	C & D	28
	Fines	29
	Misc. Nonorganics	30

15

Fayetteville, NC Set-up

Sorting Tables



Weighing and Sizing Station

Material Collection Tarp

16

Fayetteville, NC Sorting

Laborers Sorting

Sorted OCC

Sorted Film Plastic

GBB SOLID WASTE MANAGEMENT CONSULTANTS

17

Raw Data – its complicated!

Total Trash Sorted for the Week, By Constituent

Category	Constituent	Total Week, Pounds	Total Week, %
Glass	Blue Glass	25.25	0.3%
	Brown Glass	85.05	0.9%
	Clear Glass	182.05	1.9%
	Green Glass	27.00	0.3%
	Other Glass	42.40	0.4%
Paper	Cardboard	205.55	2.1%
	Newsprint	212.05	2.2%
	Office Paper	37.25	0.4%
	Other Dirty Paper (1)	1,066.90	10.9%
	Paperboard	451.05	4.6%
Metal	Ferrous Metal	218.30	2.2%
	Non-Ferrous Metal	144.45	1.5%
Plastic	PET	274.00	2.8%
	Rigid Plastic	85.65	0.9%
	Film Plastic	881.35	9.0%
	Mixed Dirty Plastic	378.45	3.9%
	HDPE	48.05	0.5%
	Styrofoam	157.30	1.6%
Organic	Food	1,156.20	11.8%
	Yard Waste	226.10	2.3%
	Misc. Organic (bath & diaper)	630.35	6.4%
Other	Appliances and Batteries	98.05	1.0%
	C&D	361.75	3.7%
	HHW	84.15	0.9%
	Misc. Nonorganic	776.50	7.9%
	Fines	1,308.95	13.4%
	Rubber	119.45	1.2%
	Textiles	511.25	5.2%
	Tires	5.10	0.1%
	Used Oil	2.75	0.0%
	TOTAL Trash Sorted	**9,802.70**	**100.0%**

Quantity of Recyclables Found Within the Sorted Trash That Could be Pratt Single Stream MRF Input Material

Category	Constituent	Total Week, Pounds
Glass	Blue Glass	25.25
	Brown Glass	85.05
	Clear Glass	182.05
	Green Glass	27.00
	Other Glass	42.40
Paper	Cardboard	205.55
	Newsprint	212.05
	Office Paper	37.25
	Other Dirty Paper (1)	0.00
	Paperboard	451.05
Metal	Ferrous Metal	218.30
	Non-Ferrous Metal	144.45
Plastic	PET	274.00
	Rigid Plastic	85.65
	Film Plastic	0.00
	Mixed Dirty Plastic	378.45
	HDPE	48.05
	Styrofoam	0.00
Organic	Food	0.00
	Yard Waste	0.00
	Misc. Organic (bath & diaper)	0.00
Other	Appliances and Batteries	0.00
	C&D	0.00
	HHW	0.00
	Misc. Nonorganic	0.00
	Fines	0.00
	Rubber	0.00
	Textiles	0.00
	Tires	0.00
	Used Oil	0.00
	TOTAL, Pounds	**2,416.55**
TOTAL, Recyclables as % of Sorted Trash		**24.7%**

(1) Very much subject to the specifications of the S-S MRF and there end market specification for baled fiber

Fayetteville, NC Trash and Recycling Material Breakdown (by weight)

Material Category	Trash Stream	Recyclables Stream
Glass	3.8%	14.7%
Paper	20.1%	55.4%
Metal	3.7%	6.9%
Plastic	18.7%	16.5%
Organic	20.3%	1%
Other	33.4%[1]	5.6%

(1) Other material category is "fines" and mixed materials

19

"Contamination" estimate

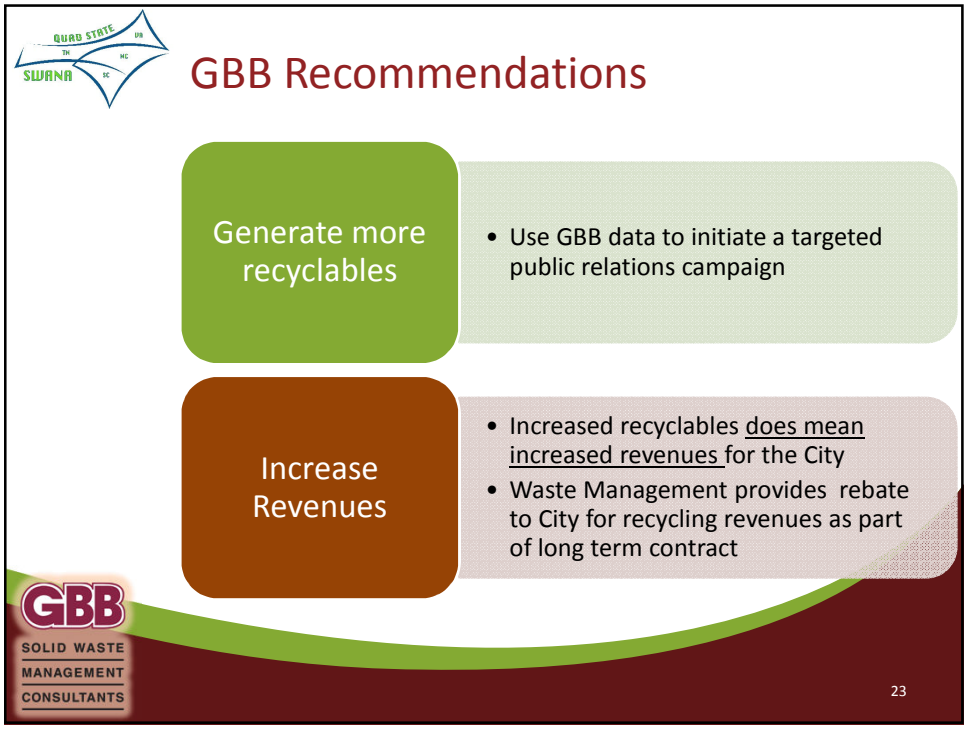
Contamination *- Material improperly segregated according to the public relations information published by the City*

	Recyclables in the Trash cart	Trash in the Recycle Cart
Total	24.7%	22.2%

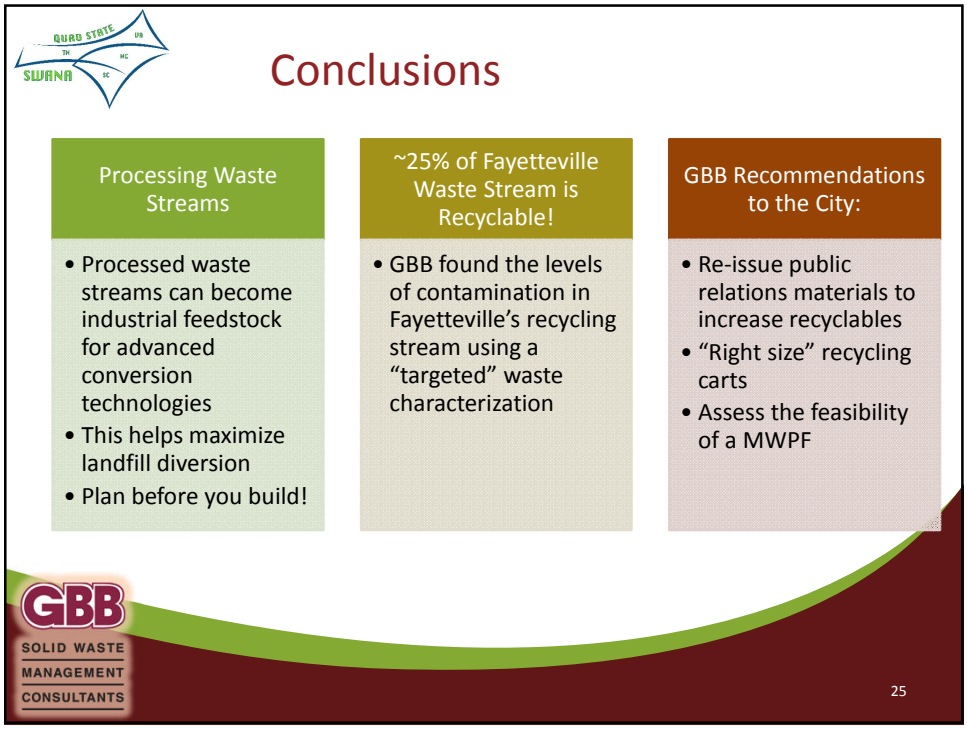
20


FINDINGS AND RECOMMENDATIONS
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
21


GBB Findings from the Waste Sort
24.7% of material in the trash was recyclable
• Based on Fayetteville recycling program
22.2% of material in the recycling carts was "residual," or garbage
• Based on the material standards of the Pratt MRF
The guidelines and/or requirements for the set-out of recyclable materials are not being followed
• A significant amount of recyclable materials is still being placed into the trash cart and vice versa
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
22


GBB Recommendations
Generate more recyclables
• Use GBB data to initiate a targeted public relations campaign
Increase Revenues
• Increased recyclables does mean increased revenues for the City
• Waste Management provides rebate to City for recycling revenues as part of long term contract
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
23


GBB Recommendations
Ensure collection is "right-sized"
• Monitor the "fullness" of the 35 gallon recycling cart on the set-out day
• Recyclables may be misplaced in trash for weekly convenience and necessity
Consider options for processing non-recycled waste
• Review the feasibility of a Mixed Waste Processing Facility to maximize diversion from landfill
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
24


Conclusions
Processing Waste Streams
• Processed waste streams can become industrial feedstock for advanced conversion technologies
• This helps maximize landfill diversion
• Plan before you build!
~25% of Fayetteville Waste Stream is Recyclable!
• GBB found the levels of contamination in Fayetteville's recycling stream using a "targeted" waste characterization
GBB Recommendations to the City:
• Re-issue public relations materials to increase recyclables
• "Right size" recycling carts
• Assess the feasibility of a MWPF
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
25


Thank You!
Eric Weiss
Consultant I
eweiss@gbbinc.com
(703) 663-2421
GBB
SOLID WASTE MANAGEMENT CONSULTANTS
26


QUAD STATE
SWANA
Sorting Garbage for Personal and Professional Development
Learning Technical Material Properties
• Municipal Solid Waste (MSW)
• C&D wastes
• Organic waste
Exposure To Disposal Facilities
• Landfill
• Transfer Station
• Baling Station
Project Management Experience
• Planning and overseeing the collection
• Data analysis
• Client relations
• Decision making support
GBB
SOLID WASTE
MANAGEMENT
CONSULTANTS
27