The City of Greensboro

Review of Three Solid Waste Options:

New Landfill
Transfer
Resource Recovery

Three Challenges – Three Opportunities

October 11, 2001

ARCADIS G&M

Greensboro Solid Waste Market: July 2000 – June 2001

Type of Waste	Total Tons/Yr.	City/Public (%)	City/Private (%)	County (%)
MSW	269,228	158,824 (59)	58,405 (22)	51,999 (19)
C&D	162,592	3,608 (2)	129,907 (80)	29,078 (18)
LCID	132,419	37,159 (28)	88,688 (67)	6,572 (5)
Y/W	9,580	6,850 (72)	2,538 (26)	193 (2)
Grand Totals	573,819	206,441 (36)	279,538 (49)	87,842 (15)

MSW = Municipal Solid Waste

C&D = Construction and Demolition

LCID = Land Clearing and Inert Debris

Y/W = Yard Waste

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Greensboro Solid Waste Market: July 2000 – June 2001

Type of Waste	Total Tons/Day	City/Public (%)	City/Private (%)	County (%)
MSW	738	435 (59)	160 (22)	142 (19)
C&D	445	10 (2)	356 (80)	80 (18)
LCID	363	102 (28)	243 (67)	18 (5)
Y/W	26	19 (72)	7 (26)	0.5 (2)
Grand Totals	1,572	566 (36)	766 (49)	240.5 (15)

MSW = Municipal Solid Waste

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New Landfill Option

New Landfill Option

Siting

Solid Waste Landfill Permitting Process

- Phase I- Site Suitability
- Phase II- Design/Construction Plans- Draft Permit
- Public Hearing
- Final Permit

Permit Appeals

Construction

Operational Facility

Traffic Issues

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New Landfill Option

Siting

Site Availability

Site Assessment

Zoning

Franchise

New Landfill Option: Franchise

DEFINITION: Approval to engage on specific Sanitary Landfill Activity; A New Landfill, Renewal of permit, or substantial change

Franchise Includes: Population and Area to be served
Amount and type of waste
useful Life of Landfill

Franchise Process: Adopt Franchise Ordinance Granting, Renewal, Extension or modification requires two regular meetings of elected officials

Only Applicable to Landfills

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New Landfill Option

Solid Waste Landfill Permitting Process

PHASE I – SITE SUITABILITY

- Airport Safety
- Floodplains
- Wetlands
- Fault Areas
- Seismic Impact
- Unstable Areas
- Cultural Resources
- Historic/Nature Preserves
- Water Supply / Watersheds
- Endangered Species
- Geologic and Hydrogeologic

New Landfill Option

Phase II – Design and Construction Plans

Technical Engineering Review

Draft Permit

New Landfill Option

Public Hearing

45-Day Public Notice

New Landfill Option

Public Hearing

Final Permit

Permit Appeals

Construction of Facility

Operational Facility

New Landfill Option: Traffic Impacts

Current Traffic:

Number of Vehicles per Month By Waste Type

	MSW	C/D	LCID	Y/W	CS/MSW	CS/CD
Highest	4249	3684	2326	1381	1238	833
Average	3942	2952	1757	865	1034	739

Total: Per Month		Per Day:
Highest	13,711	572
Average	11,289	470

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New Landfill Option

Traffic Impact: Number of Vehicles by Waste Type/day and Percent of Traffic

	MSW	CD	LCD	Y/W	CS/MSW	CS/CD
HIGH	177 (31%)	154 (27%)	97 (17%)	58 (10%)	52 (9%)	35 (6%)

TOTAL 572/DAY

- **85% is truck traffic**
- **15% is small vehicle traffic**
- **Traffic impact must consider both access and egress (impact doubles)**
- **Single axle at 23,500 lbs equals 100 cars for road-wear**
- **18 wheelers at 42,000 lbs equals 200 cars for road-wear**
- **Turn lanes essential: both left and right lanes**
- **City has authority to direct routes**
- **Litter is proportional to traffic volume and enforcement**
- **Range of vehicles per day is 200 to 100,000 on roads in Guilford County**

Mecklenburg County

Mr. Cary S. Saul

Director, Land Use &
Environmental Services

Transfer Option

Transfer Option

- Transfer Station (or Stations)
- Siting- Zoning Consistency Requirements
- Permitting-
  - Greater Than 350 Tons Per Day Requires Environmental Assessment and is a 90 Day Process
  - Draft Permit for Engineering Design and Operation is a 90 Day Process
  - Draft Permit and Environmental Assessment Run Concurrently
  - Public Notice/Hearing (if required) May Add 45-60 Days to Process
  - Final Permit to Construct and Operate Issued
  - Approximately 70 Permitted Transfer Stations in NC. 20 Required Environmental Assessments. Only 2 Were Required to Provide Additional Comments

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Transfer Option: Environmental Assessment

CONTENT:

Project Description
Purpose
Alternatives
Easting Environmental Characteristics

Topography, Soils, Land Use Wetlands, Agricultural lands, Public Lands, Archaeological or Historical value, Air Quality, Noise, Water Resources, Forest Resources, Shellfish Fish Habitat, Wildlife and Natural Vegetation

Predicted Environmental Effects
Mitigative Measures
References, Exhibits, Required Permits

Process: Submitted to all relevant state agencies for comments

Results: (1) Finding of no significant impact (FONSI) 90 days
(2) Environmental Impact Statement (EIS) 12 Months
EIS is Public Noticed for Comment and Response

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Transfer Option

Transfer Option

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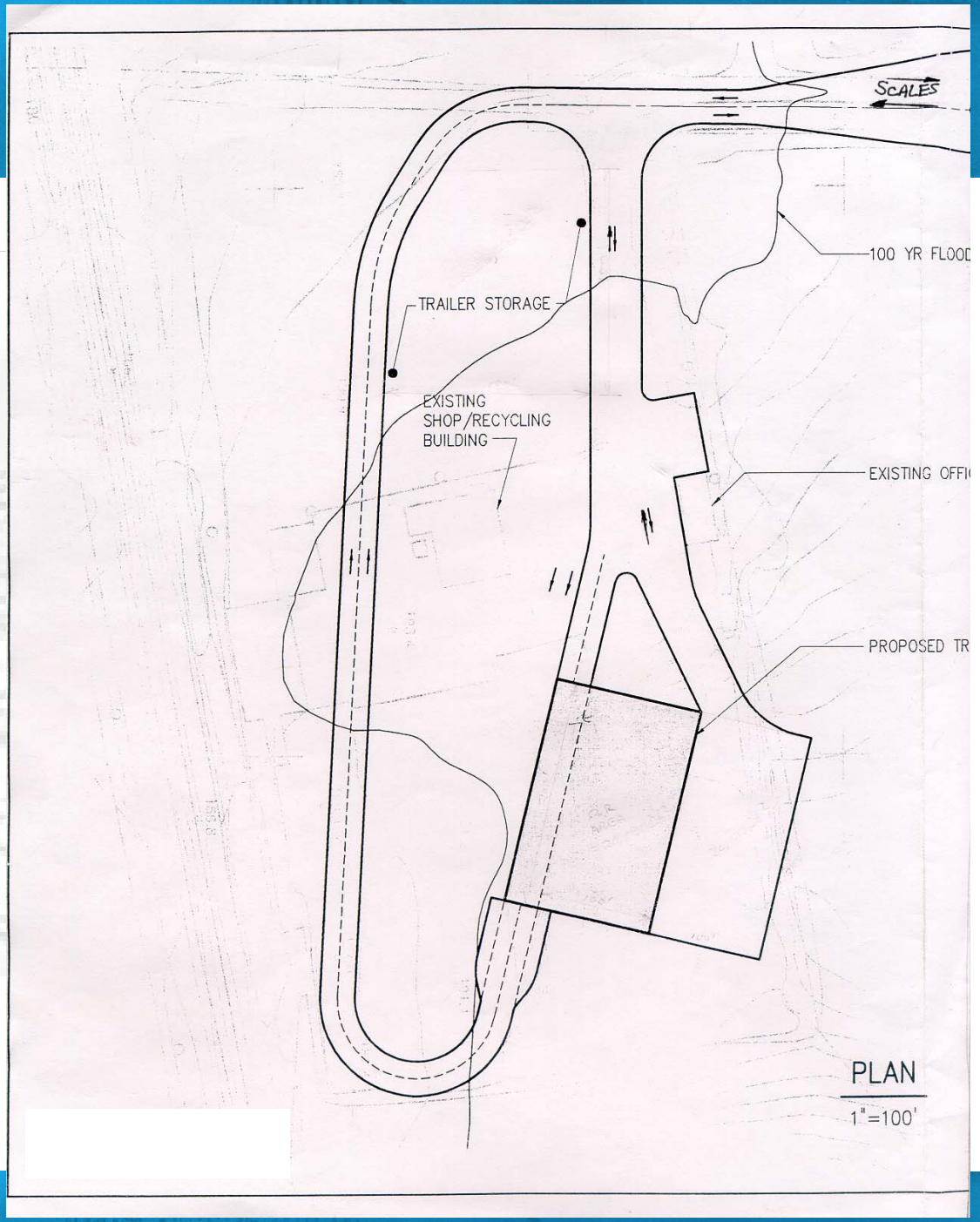
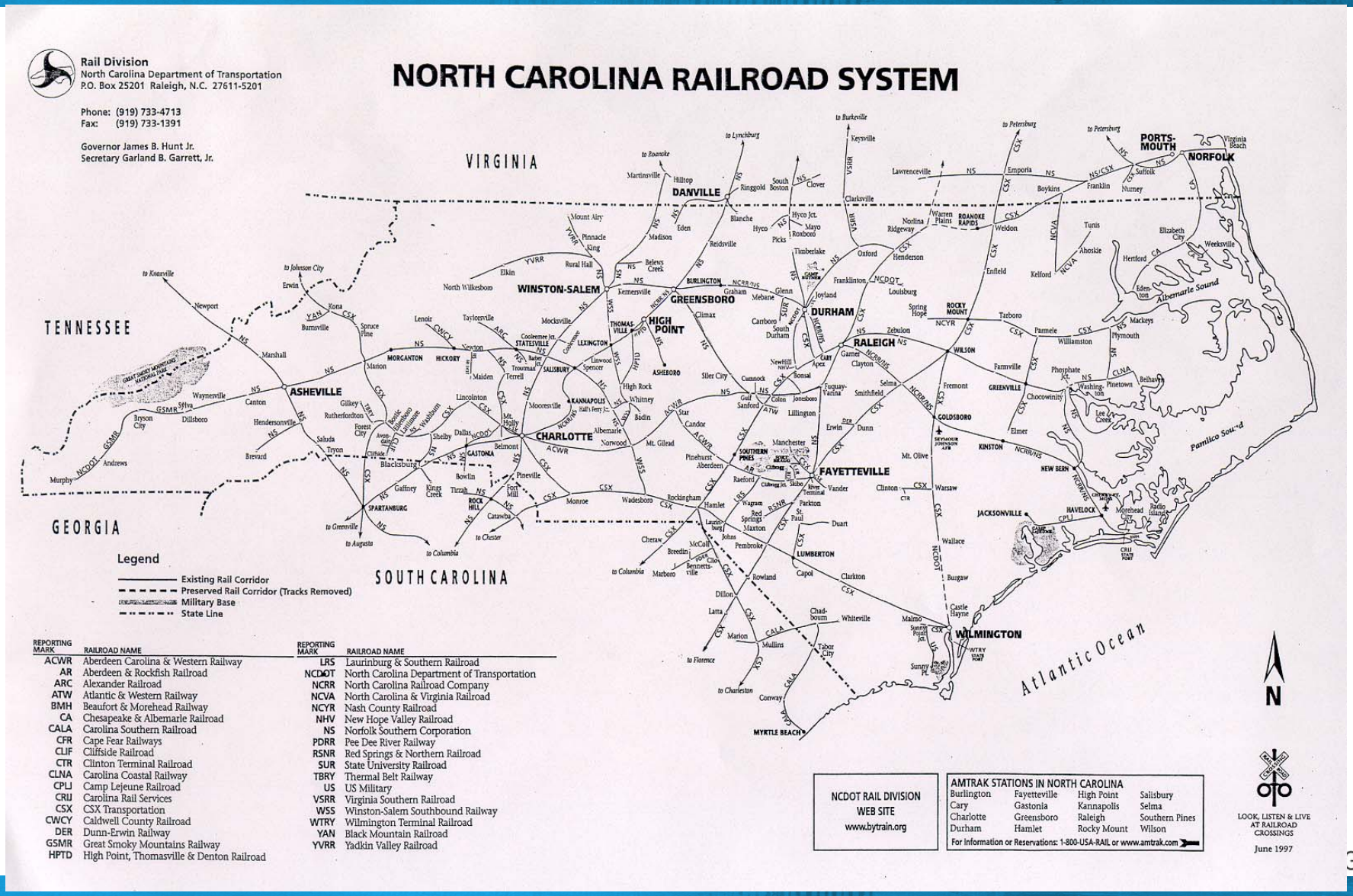
Transfer Option

Transfer Option

City of Raleigh
Proposed Transfer
Station Traffic Pattern



Transfer Option: Rail Transport



Resource Recovery Option

Waste to Energy Option

Waste to Energy Option

Air Quality

- Siting
- Permitting
- Draft Permit
- Public Hearing
- Final Permit
- Construction
- Operational Facility

Solid Waste

- Siting
- Permitting
- Draft Permit
- Public Hearing
- Final Permit
- Construction
- Operational Facility

Waste to Energy Option

Air Quality	Solid Waste
• Siting	• Siting
• Permitting	• Permitting
• Draft Permit	• Draft Permit
• Public Hearing	• Public Hearing
• Final Permit	• Final Permit
• Construction	• Construction
• Operational Facility	• Operational Facility

Waste to Energy Option

SITING

Air Quality

Analysis of Impact on Air Quality, Visibility, Soils and Vegetation

Plan for Waste Reduction and Recycling

Zoning Consistency

Solid Waste

Environmental assessments (If greater than 350 T/day)

Review Plan

Zoning Consistency

Waste to Energy Option

Air Quality	Solid Waste
• Siting	• Siting
• **Permitting**	• **Permitting**
• Draft Permit	• Draft Permit
• Public Hearing	• Public Hearing
• Final Permit	• Final Permit
• Construction	• Construction
• Operational Facility	• Operational Facility

Waste to Energy Option

Permitting

The Environmental Assessment

- Greater than 350 tons per day

- All state agencies and public comments included on proposal

- If no significant impact is identified: a Finding of No Significant Impact (FONSI) is issued (a 90-day process)

- If significant impact is determined: a full Environmental Impact Statement (EIS) is required (typical duration: One year)

Waste to Energy Option Environmental Assessment

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EIS is Public Noticed for Comment and Response

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Waste to Energy Option

Air Quality

- Siting
- **Permitting**
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Solid Waste

- Siting
- **Permitting**
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Waste to Energy Option

Permitting

Air Quality Permitting Process

- New Source Review/Prevention of Significant deterioration
- Air dispersion modeling
- Waste Feed Controls
- Monitoring / Operation

Solid Waste Permitting Process

- Waste Unloading at Waste Energy Facilities
- Ash Testing / Management

Waste to Energy Option

Permitting

Air Quality Permitting

Construction / Operation (Physical)

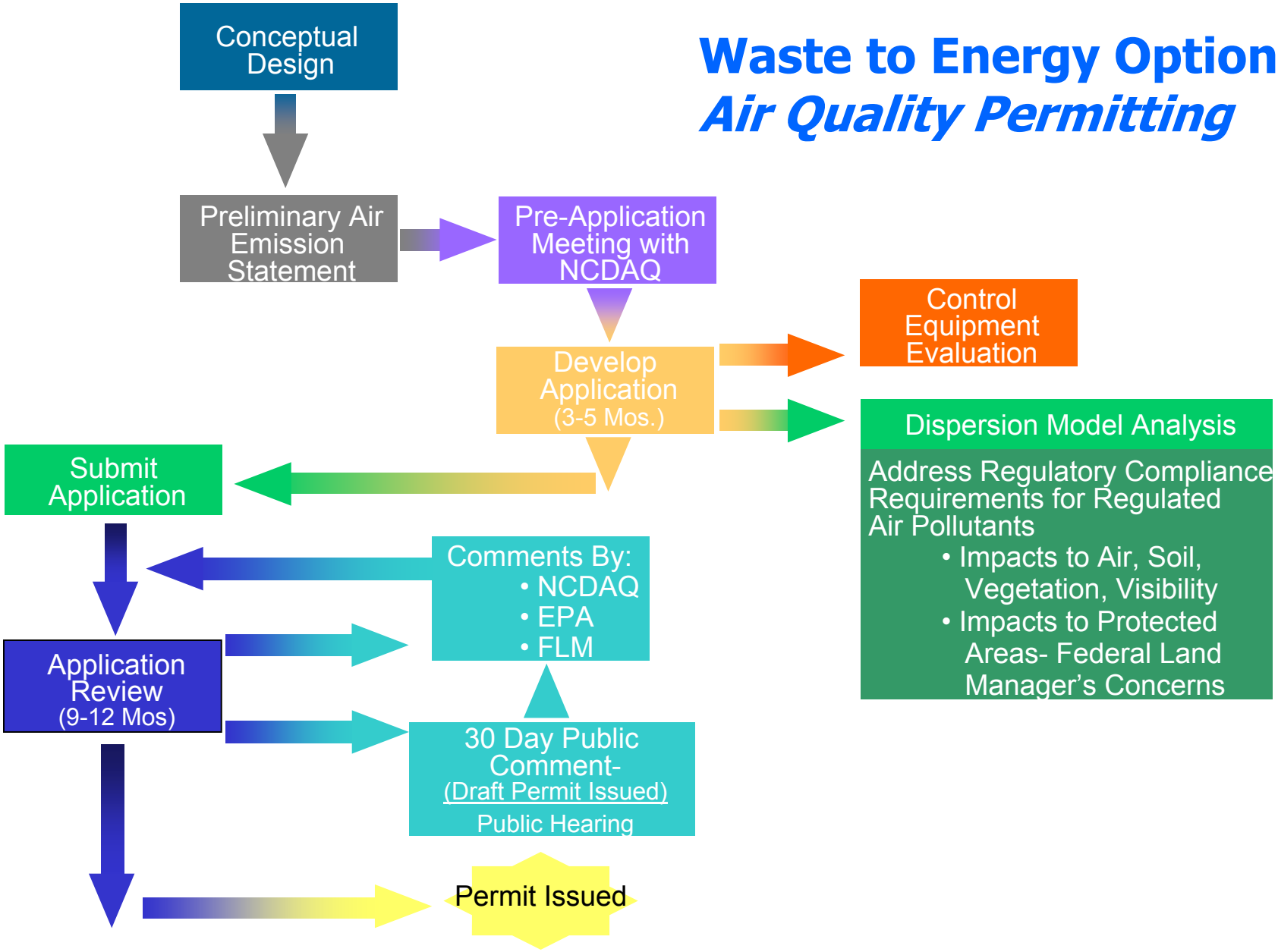
Operational Approval

Trial Burn

Monitoring

Modifications

Waste to Energy Option
Air Quality Permitting



Waste to Energy Option

Air Quality	Solid Waste
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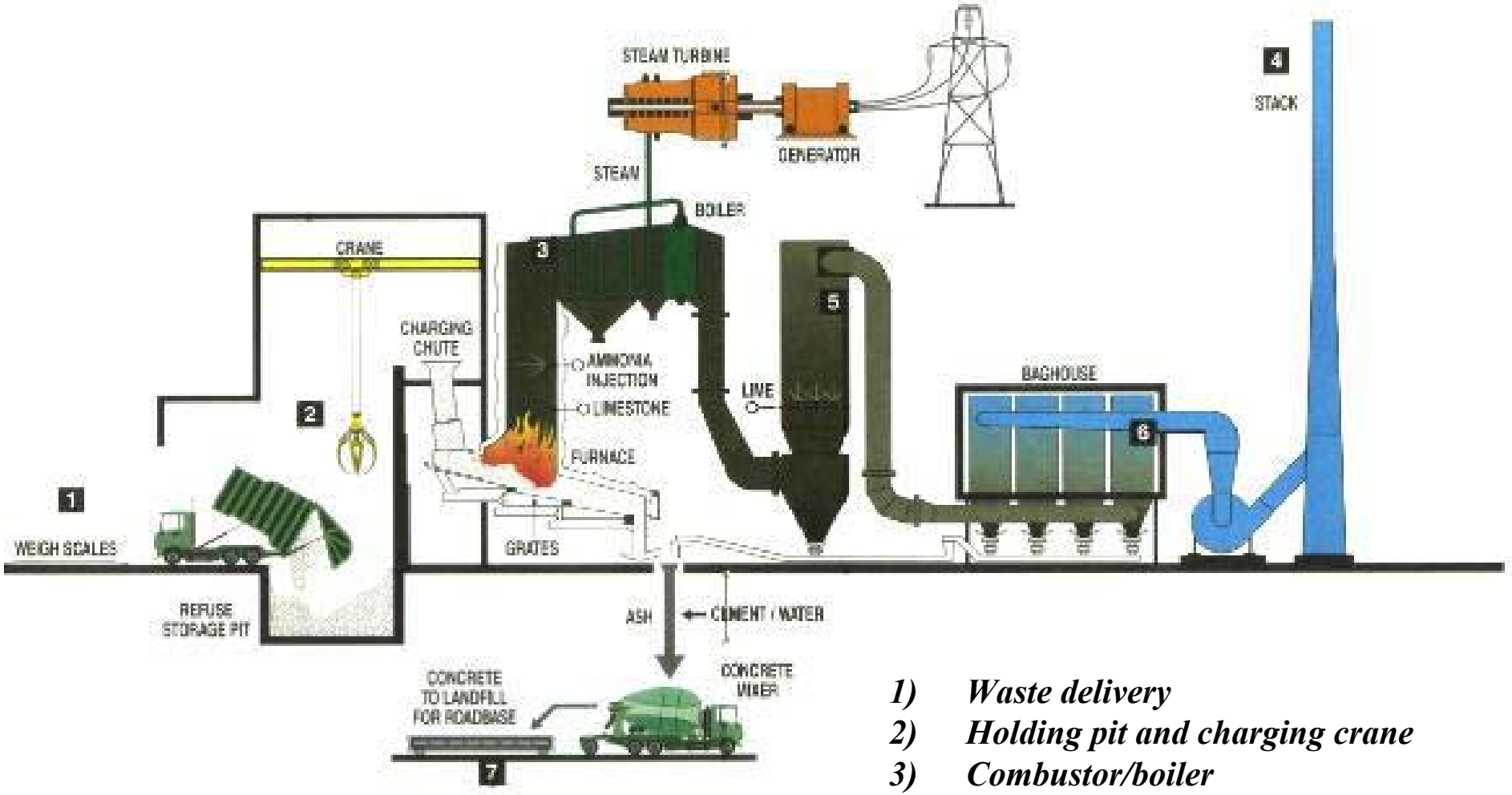

1) *Waste delivery*
2) *Holding pit and charging crane*
3) *Combustor/boiler*
4) *Stack*
5) *Spray dryer*
6) *Fabric filter/baghouse*
7) *Ash disposal*

Waste to Energy Option

Sampling Matrix

				How Often?			
Species	Methodology	Reg. Limit	Units	Startup	Continuous	12 month	Diagram location
Particulate Matter	EPA Method 5	24	mg/DSCM	x		x	4
Opacity	EPA Method 9	10%	NA	x	x		4
Cadmium	EPA Method 29	0.02	mg/DSCM	x		x	4
Lead	EPA Method 29	0.2	mg/DSCM	x		x	4
Mercury	EPA Method 29	0.08	mg/DSCM	x		x	4 (or across 6)
SO2	CEM	30	ppmv	x	x		4 (or across 5)
HCl	EPA Method 26	25	ppmv	x		x	4 (or across 5)
PCDD/PCDF	Method 23	13	ng/DSCM	x		x	4
NOx	CEM	150	ppmv	x	x		4
CO	CEM	100	ppmv	x	x		4
O2 or CO2	CEM		%	x	x		all sampling pt.
Steam (or feedwater)	flow meter		kg/hour	x	x		3
PM control device inlet temperature	thermocouple		degrees	x	x		pre 6
Carbon feed rate	(estimate based on feeder screw rate, etc.)		kg/hour	x	x		pre 6
Visible fugitive ash emissions	EPA Method 22	5	%	x		x	7
Ash	TCLP						post 7

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Waste to Energy Option

Prevention of Significant Deterioration (PSD):

An air quality permitting procedure for a new "major" emission source located in a region that is in "attainment" of the National Ambient Air Quality Standards. The applicant must analyze what is the "Best Available Control Technology" (BACT) for controlling air emissions from the source. The analysis includes environmental, energy, economic and technical feasibility considerations for several emission control technologies that could be used. The analysis pertains to the control of the "major" pollutants emitted from the facility.

Maximum Achievable Control Technology (MACT):

Technology-based air emission standard for controlling "major" levels of specific hazardous air pollutants from specific industrial/municipal emission sources. These custom tailored standards establish a minimum level of control of hazardous air pollutants emitted from existing and new emission sources in the source categories.

Continuous Emissions Monitor (CEM)

This is a generic reference to a device that is used for measuring the actual emission rate of a specific air pollutant or opacity every 15 minutes (or less). It is usually installed on the exhaust stack just prior to the discharge point to the atmosphere.

ppmv = Parts per million by volume

This is a unit of measure for concentration of gases. It is especially useful for direct-readout measuring devices that are detecting gaseous air pollutants.

Waste to Energy Option

EPA Method 5 – Particulate Matter

This is an emission test method for measuring the rate of particulate matter emissions from a source. The sample is pulled from the stack at the same velocity that it is traveling within the stack, using equipment heated to the same temperature as the stack gases (isometric sampling). Stack gas is drawn through a filter and into impingers according to this method to quantify both condensable and non-condensable particulate matter.

EPA Method 9 – Opacity

This is a visual method for measuring the opacity of the plume from a stack, conducted by a trained observer who is certified to conduct the reading.

EPA Method 23 – Dioxins and Furans

Emission test method using the sample sampling equipment as Method 5, where a glass fiber filter is used to capture dioxins and furans. The analytical requires high-resolution gas chromatography to separate the analytes, and high-resolution mass spectrometry to quantify them.

EPA Method 29 – Metals

Emission test method using the same equipment as EPA Method 5, except that an aqueous acidic solution is used in the impingers to capture the metals.

Waste to Energy Option

Environmental Equity

- Identification
- Participation
- Information
- Mitigation
- Successful protection of public health, safety, and welfare

Conclusions:

New Landfill?
Transfer?
Waste to Energy

Three Proven Technologies
Three Challenges - Three Opportunities

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New Hanover County

Mr. Raymond L. Church, Jr.
Director, New Hanover County
Dept. of Environmental Management

Mr. John Hubbard
Plant Manager

WASTEC


NEW HANOVER COUNTY
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WASTEC
WASTE-TO-ENERGY CONVERSION FACILITY
WASTEC

Background Data

- WASTEC opened in 1984
- Voters approve expansion in 1991
- Financed via General Obligation Bonds
- Total cost $55,000,000 (today's dollars)

Plant Operations

Air Quality

- **WASTEC met all large unit regulations by the December 2000 deadline**
- **WASTEC is in the process of meeting the regulations for small units by the December 2004 deadline**

Tonnage (500 tons per day)

Advantages

- Saves landfill space
- Ash can be used as daily cover
- Incineration process generates electricity that is sold to CP&L for revenues

Mecklenburg County

Mr. Cary S. Saul

Director, Land Use &
Environmental Services