



City of Lincoln  
**Solid Waste Facilities Plan**

*Draft*  
August 2006



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**Appendices** Not Included

- Appendix A, Bluff Road Operating Permit
- Appendix B, North 48th Street Operating Permit
- Appendix C, Transfer Station Operating Permit/Operating Plan
- Appendix D, Bluff Road Capital Improvements Budget – Cost Estimates
- Appendix E, North 48th Street Capital Improvements Budget – Cost Estimates
- Appendix F, Transfer Station Capital Improvements Budget – Cost Estimates
- Appendix G, Waste Diversion Capital Improvements Budget – Cost Estimates
- Appendix H, Historical Rates and Current Rate Resolution
- Appendix I, City Ordinance – Occupation Tax Ruling
- Appendix J, Facility Location Maps



## Acronyms, Abbreviations, and Short Forms

1994 Plan	Lincoln-Lancaster Solid Waste Plan developed in 1994
2000 Plan Update	2000 update to the 1994 Plan
2002 Comprehensive Plan	2002 Lincoln City/Lancaster County Comprehensive Plan
2030 Comprehensive Plan	2030 Lincoln City/Lancaster County Comprehensive Plan
AACE	American Association of Cost Engineers
AC	Advisory Circular
Act	Nebraska Integrated Solid Waste Management Act of 1992
ADC	alternate daily cover
CAA	Clean Air Act and the 1990 Amendment
Carbone	<i>C&amp;A Carbone v. Town of Clarkstown, New York</i> , 511 U.S. 383 (1994)
CFR	Code of Federal Regulations
City	City of Lincoln, Nebraska
cm	centimeter(s)
County	County of Lancaster, Nebraska
CQA	construction quality assurance
CY	cubic yard(s)
DTM	digital terrain modeling
EG	Emission Guidelines
ENR	<i>Engineering New-Record</i>
FAA	Federal Aviation Agency
FML	flexible membrane liner
FY	fiscal year
HAP	hazardous air pollutants
HDPE	high-density polyethylene (#2 plastic)
Landfill Gas Rules	40 CFR Part 60, Subparts Cc and WWW, Standards for Performance for New Municipal Solid Waste Landfills and Emission Guidelines for Existing Municipal Solid Waste Landfill
lb	pound(s)
Mg	megagram(s)



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mil	millimeter(s)
MRF	materials recovery facility
MSW	municipal solid waste
NAICS	North American Industry Classification System
NDEQ	Nebraska Department of Environmental Quality
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMOC	non-methane organic compound
NPDES	National Pollutant Discharge Elimination System
NPPD	Nebraska Public Power District
NSPS	New Source Performance Standards
OCC	old corrugated cardboard
PCB	polychlorinated biphenyl
PET	polyethylene terephthalate (#1 plastic)
Plan	City of Lincoln, Nebraska, Solid Waste Facilities Plan (presented in this document)
RCRA	Resource Conservation and Recovery Act
RD&D	research, development, and demonstration
Service Area	the solid waste planning area addressed in this Plan, which is contiguous with the County
State	State of Nebraska
Subtitle D Rules	CFR Parts 257 and 258, Solid Waste Disposal Facility Criteria
USC	United States Code



## **Executive Summary**

### **Background**

The City of Lincoln, Nebraska (City) and the surrounding County of Lancaster (County) developed a Lincoln-Lancaster Solid Management Waste Plan in 1994 (1994 Plan), which defined the solid waste management strategies, programs, and facilities. The 1994 Plan was updated in 2000 (2000 Plan Update) to document the progress achieved toward the goals established in the 1994 Plan.

The City determined the need for a long-term facilities plan that can provide general guidance in the annual planning process and identify critical issues that need to be addressed in future solid waste management plan updates. Consequently, this Solid Waste Facilities Plan (Plan) has been prepared to facilitate the annual budgeting and facility planning progress. This Plan identifies the solid waste collection and diversion programs; identifies capacities for the Lincoln-Lancaster Service Area (defined below); and provides historic data, current data, and future projections with respect to solid waste generation. This information has been used to provide projections for future planning decisions and system capacity requirements for new or expanded waste disposal and diversion facilities.

### **Planning Goals and Objectives**

The purpose of the Plan is to:

- ❖ Provide an overview of the current solid waste practices, regulatory requirements, and City and County governing policies.
- ❖ Define Service Area characteristic and factors affecting the Plan and future management needs.
- ❖ Quantify the current wastes streams that need to be managed and project future quantities based on historical trends and demographic projections.
- ❖ Describe the existing waste management facilities and programs, including planned developments, provided by both the public and private sectors.
- ❖ Provide a management and planning guidance document for anticipated facility capital improvement requirements, future capacity needs, and future planning and community involvement.
- ❖ Serve as a summary for elected leadership and City managers.

### **Service Area Boundaries**

The Service Area is the solid waste planning area addressed in this Plan, which is contiguous with the County.

### **Population Projections**

According to the 2000 U.S. Census, the City had 225,581 residents and the County had an estimated 250,291 residents. The City population density was reported in 2000 Census data to be 3,022 people per square mile, and the County population density was 298 per square mile. In the decade from 1990 to 2000, population increased by 1.63 percent in the City and 1.60 percent in the County, as shown in Table ES-1.



**TABLE ES-1 – HISTORIC POPULATION**

	1980 Census	1990 Census	2000 Census	Change Last Decade
<b>City of Lincoln:</b>	171,932	191,972	225,581	1.63%
<b>Total County:</b>	192,884	213,641	250,291	1.60%

Source: U.S. Census Bureau, Census 2000

The Lincoln Planning Department has completed a 2030 Lincoln City/Lancaster County Comprehensive Plan (2030 Comprehensive Plan), which was adopted November 16, 2006. According to the 2030 Comprehensive Plan, Lancaster County’s population is assumed to reach over 390,000 by the year 2030, or 140,000 more residents than the County’s 2000 population base of 250,291. By the year 2050, it is projected that Lancaster County’s population will reach 527,000 residents, or 277,000 more people than reside in the county today. This growth is based on an assumed rate of 1.5 percent per year throughout a fifty year period (2000-2050). See Table ES-2.

**TABLE ES-2 – POPULATION PROJECTIONS**

	2000	2010	2020	2030	2050
<b>City of Lincoln:</b>	225,581	261,796	303,825	352,601	474,903
<b>Total County:</b>	250,291	290,473	337,106	391,225	526,923

## Regulatory Factors

The principal regulations affecting the City’s solid waste facilities are the following:

- ❖ Resource Conservation and Recovery Act (RCRA) – 40 Code of Federal Regulations (CFR) Parts 257 and 258, Solid Waste Disposal Facility Criteria (Subtitle D Rules)
- ❖ Clean Air Act and the 1990 Amendment (CAA) – 40 CFR Part 60, Subparts Cc and WWW, Standards of Performance for New Municipal Solid Waste Landfills and Emission Guidelines for Existing Municipal Solid Waste Landfill (Landfill Gas Rules)
- ❖ Nebraska Department of Environmental Quality – Title 132, Integrated Solid Waste Management Regulations, Title 128 Hazardous Waste Rules, and Title 129, Air Quality Regulations
- ❖ Lincoln Municipal Code, Chapter 8.32

## Solid Waste Collection and Handling

### *Collection Practices*

None of the municipalities in the County provide either public or franchise collection service for solid waste. All waste collection in the Service Area is provided by 48 licensed private waste haulers (10 commercial, 32 residential, and six residential and commercial). Residential and commercial collection services are provided by the haulers under an open competition system. Residents and businesses can also elect to self-haul their own waste.

The collection industry trends toward business consolidation are anticipated to continue, which will reduce the number of independent haulers over time, but hauling will likely remain a private-



sector function. Therefore, no public facilities are expected to be needed for this component of the solid waste system.

### ***Recycling Drop-off Centers***

The County has a network of 33 recycling drop-off sites, consisting of 27 sites in the City and 6 sites located in the County. Of the 27 City drop-off sites, 22 are multi-material sites which accept newspaper, mixed paper, cardboard, clear glass, green glass, brown glass, aluminum cans, steel cans (tin), and polyethylene (PET) and high-density polyethylene terephthalate (HDPE) containers. The remaining 5 sites collect newspaper only. The 6 County sites are all multi-material sites, including those in the cities of Hickman and Waverly and the villages of Bennet, Davey, Firth and Panama.

The City's current siting criteria for recycling drop-off areas are as follows:

- ❖ Located in high visibility/high traffic areas
- ❖ Serving an average of 8,500 people,
- ❖ Serving no more than a 4-square-mile area (that is, a 1-mile radius from site), and
- ❖ Located within an urban environment

### ***Recyclable Processing Capacity***

A 40,000-square-foot material recycling facility processes all of the recyclables collected by the City's recycling drop-off sites as well as recyclables from private businesses. The facility averages roughly 4,000 tons of material per month, which is estimated to be approximately 60 percent of its capacity.

This component of the solid waste system is expected to remain a private-sector function for the foreseeable future unless major changes in the Lincoln-Lancaster Solid Waste Management Plan occur during periodic plan updates. Any facility capacity expansions are likely to be driven by market competition.

### ***Transfer Stations***

One small vehicle transfer station in the City-County area is located at the North 48<sup>th</sup> Street site (discussed below). This facility is intended to provide disposal services for County citizens without collection services or with special disposal needs. The transfer station use is limited to cars, pickups, trailers, and other small vehicles that have maximum cargo box dimensions of 6 feet by 8 feet by 5 feet high. It accepts grass and leaves, brush, appliances, metals, and tires, which must be sorted out and placed in their designated areas.

The decision to expand, relocate, or add a transfer station facility will be evaluated during the future Lincoln-Lancaster Solid Waste Plan update. Any facility modification should be based on customer surveys, net revenue analysis, and waste control requirements.

## **Solid Waste Disposal Facilities**

### ***Waste Quantity Projections***

Quantity estimates for generated waste, recovered recyclables, and residual disposal have been prepared for the next 25 years based on the historical data on waste generation, recycled waste and waste disposal as well as the County population projections. Waste generation is the sum of



recycled waste and waste disposal. A summary of this data (in five-year increments) is shown in Table ES-3.

For these estimates, it is assumed that there are no changes in the current recycling programs and that the per capita waste generation rates for both municipal solid waste (MSW) and construction and demolition (C&D) wastes continue at the historical average levels. The recycling quantities are based on available historical recycling data; including drop-off materials, organic recycling of compost, wood chips, and land applied biosolids as well as reported private recycling. It is also assumed that the average annual generation of special waste (such as asbestos, ash, biosolids, and contaminated soils) remains relatively constant over the analysis period. Because special waste quantities have fluctuated but not changed substantially over the last 15 years, these quantities are expected to remain relatively flat during the 25-year planning period ending in 2030.

**TABLE ES-3 – SOLID WASTE GENERATION AND DISPOSAL ESTIMATES**

Fiscal Year	County Population	Waste Generation			Recycled Waste (tons)	Waste Disposal Estimate		
		MSW (tons)	Special Waste (tons)	C&D Waste (tons)		MSW (tons)	Special Waste (tons)	C&D Waste (tons)
99-00	250,291	425,495	12,000	412,980	456,531	278,699	12,000	103,245
04-05	264,814	450,184	12,000	436,943	483,021	294,870	12,000	109,236
09-10	282,899	480,928	12,000	466,783	516,007	315,008	12,000	116,696
14-15	302,219	513,772	12,000	498,661	551,247	336,521	12,000	124,665
19-20	322,858	548,859	12,000	532,716	588,893	359,502	12,000	133,179
24-25	344,907	586,342	12,000	569,096	629,110	384,054	12,000	142,274
29-30	368,461	626,384	12,000	607,961	672,074	410,282	12,000	151,990

***Existing Disposal Facilities and Capacity***

***Bluff Road Landfill***

The Bluff Road Landfill is the only permitted MSW landfill in Lancaster County. This landfill has been in operation since October 1988. When it reaches capacity, the current landfill will cover 171 acres of the 360-acre location and contain over 23 million cubic yards (CY) of waste (excluding the liner system and final cover).

The City owns property to the east of the existing landfill, which it currently plans to permit as a landfill to provide solid waste disposal services once Bluff Road Landfill reaches capacity. Planning for the development of a new landfill site will require approximately five years or more.

The City's landfill is expected to reach capacity in the year 2030 (based on 2002 permit projections). Based on 2002 projections for 2006, the remaining capacity is 14,899,850 CY (excluding final soil cover) of landfill volume. Approximately 25 acres of the landfill have reached capacity and have been capped with an additional 15 acres projected to be capped concurrently with the liner construction in 2006.

***North 48<sup>th</sup> Street Landfill***

The North 48<sup>th</sup> Street Landfill (previously known as Landfill East and Landfill West), located at 5101 North 48<sup>th</sup> Street, began accepting solid waste in 1956 and continued operating through 1988, when the Bluff Road Landfill opened. A portion of the closed landfill site is used as a



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permitted C&D landfill. The closed landfill requires ongoing maintenance and environmental reporting efforts; it has several groundwater monitoring wells and gas monitoring probes.

The C&D site at the North 48<sup>th</sup> Street location had an initial volume of approximately 2 million CY. The remaining capacity based on a 2002 aerial survey and projections for 2006 is approximately 1 million CY (excluding final cover soil). The North 48<sup>th</sup> Street C&D site is estimated to have capacity until 2021.

Planning for the development of a new C&D landfill site after the currently estimated closure date of 2021 will require approximately five years or more. Therefore a decision on whether the City will provide a new facility needs to take place prior to 2015.

### ***Other Disposal Facilities***

Some solid waste is transferred out of the County to the G&P Development, Inc. Landfill at Milford, Nebraska. In addition, there is one limited landfill permitted in the County, which is located on the south side of west "O" Street, a few hundred feet west of SW 27<sup>th</sup> Street. This site can only accept concrete and brick materials, and its permit expires in August 2006.

Coal ash from the Sheldon Power Plant in Hallam, Nebraska, is used by McCabe Minerals, which has a processing plant at the Sheldon facility. Ash that is not recovered is disposed of by the Nebraska Public Power District (NPPD) in a permitted ash disposal landfill near the plant. Under the current operating conditions, the site will have capacity for approximately 12 to 15 more years.

## **Principal Planning Issues**

### ***Land Requirements***

The City owns the land required for expansion of MSW landfill disposal to serve projected needs through 2030. However, the land required for the C&D materials and any future transfer station and/or drop-off convenience facilities for the projected future needs has not been acquired.

### ***Drop-off Facilities***

New drop-off sites will be needed as the City grows in size and population. Ideal locations would be in the south eastern portion of the City because the majority of the City's population resides there and the population is expected to continue to grow in this area.

### ***Transfer Station Facilities***

As the urban area expands, the City will need to consider the development of a more rural transfer station site and the question of whether to allow collection vehicles access to the transfer station. The City will need to plan the development of any new facility approximately five years prior to the closing date of the existing transfer station but may need to consider purchasing the land several years prior to that.

### ***MSW Disposal***

Although the City has sufficient capacity for MSW disposal during the planning period and owns land adjacent to the existing Bluff Roads Landfill that is planned for the future landfill, a number



## Solid Waste Facilities Plan

of cell expansion projects and capping projects will continue to require significant capital expenditures.

### ***C&D Disposal***

The North 48<sup>th</sup> Street C&D site is estimated to be at approximately 50 percent of capacity, with a remaining site life of approximately 17 years. The City will need to decide through the Solid Waste Management Plan update how to provide for future C&D disposal capacity needs.

### ***Limited Landfills***

Many construction contractors operate their own C&D salvage operations, and other limited landfill operations for clean construction fill materials are expected to be developed by the private sector. The City will be asked to approve permits associated with these sites.

## **Projected Capital Improvements Requirements**

### ***Capital Funding Projects***

The Capitol Improvement Program for 2006 to 2012 was divided into two “project” categories: the first project is for the Bluff Road Landfill and the second is for Other Solid Waste Programs including the North 48<sup>th</sup> Street Landfill and Transfer Station and recycling/composting programs. The City’s current short-term capital improvement projections are presented Table ES-4.



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**TABLE ES-4 – SHORT TERM CAPITAL IMPROVEMENT EXPENDITURES**

Project Title	Proj Prio.	Short-Term Programmed Expenditures (000's)					
		FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
<b>MSW Landfill - Bluff Road</b>							
a. Landfill Expansions - Leachate Collection and Liner Systems	A	0	200	2400	0	400	5200
b. Site Maintenance and Closure	A	160	160	490	170	180	180
c. Final Cover & Landfill Gas Control Systems	A	20	1250	3528	13	170	2037
d. Leachate Collection & Treatment Facilities	B	0	0	0	0	0	200
e. Site Re-Permitting	B	0	40	0	0	0	0
f. Special Projects		0	0	280	0	0	1602
g. New MSW Landfill		0	0	0	0	0	0
<b>Total - Project 1 (Landfill Revenue)</b>		<b>180</b>	<b>1650</b>	<b>6699</b>	<b>183</b>	<b>750</b>	<b>9219</b>
<b>Solid Waste Management Programs Other Than MSW Landfill</b>							
a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	390	340	0	0	750	0
b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	420	30	200	0	70	780
c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	25	20	0	0	0	30
d. Parks Development (N. 48th Street)	C	No funding is currently identified for the project.					
e. Solid Waste Management Plan Update	B	0	0	0	0	0	70
f. Future C&D Landfill Site	B	0	0	0	0	0	0
g. Recycling Drop-Off Site Maint./Improv.	A	0	10	0	10	10	10
h. Expansion of Recycling Drop-Off Program	A	90	45	45	45	45	45
i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	0	60	0	60	0	60
j. Convenience Center Transfer Station		No funding at this time; subject to SWM Plan Update decisions					
k. Groundwater Remediation (N. 48th Street)		50	200	100	UNKNOWN		0
<b>Total - Project 2 (Occupation Tax)</b>		<b>975</b>	<b>705</b>	<b>345</b>	<b>115</b>	<b>875</b>	<b>995</b>

To facilitate long-term planning efforts the anticipated capital improvement projects beyond the City's five year planning period have also been estimated and are shown in Table ES-5.



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### TABLE ES-5 – LONG-TERM SOLID WASTE FACILITIES CAPITAL IMPROVEMENTS

Proj No.	Project Title	Proj Prio.	Long-Term Facilities Plan Expenditures (000's)									
			FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	
<b>1</b>	<b>MSW Landfill - Bluff Road</b>											
	a. Landfill Expansions - Leachate Collection and Liner Systems	A	389	2271.95	0	808	4716.98	0	0	574	3353	
	b. Site Maintenance and Closure	A	200	200	210	220	220	230	230	240	250	
	c. Final Cover & Landfill Gas Control Systems	A	256	2880	15	432	3967	0	0	429	3858	
	d. Leachate Collection & Treatment Facilities	B	0	1000	0	0	0	0	0	0	0	
	e. Site Re-Permitting	B	58	0	0	0	0	67	0	0	0	
	f. Special Projects		0	8	0	0	4	0	0	0	9	
	g. New MSW Landfill		0	0	0	0	0	0	0	0	0	
<b>Total - Project 1 (Landfill Revenue)</b>			<b>903</b>	<b>6360</b>	<b>225</b>	<b>1460</b>	<b>8908</b>	<b>297</b>	<b>230</b>	<b>1243</b>	<b>7471</b>	
<b>2</b>	<b>Solid Waste Management Programs Other Than MSW Landfill</b>											
	a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	0	0	0	0	0	0	0	0	0	
	b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	204	0	24	223	0	31	292	43	400	
	c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	23	0	0	0	35	27	0	0	0	
	d. Parks Development (N. 48th Street)	C	No funding is currently identified for the project.					0	0	0	0	
	e. Solid Waste Management Plan Update	B	0	0	0	0	81	0	0	0	0	
	f. Future C&D Landfill Site	B	0	0	0	0	0	0	0	0	0	
	g. Recycling Drop-Off Site Maint./Improv.	A	12	13	13	13	14	14	15	15	16	
	h. Expansion of Recycling Drop-Off Program	A	0	0	0	0	62	0	0	68	0	
	i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	0	76	0	81	0	86	0	91	0	
	j. Convenience Center Transfer Station		No funding at this time; subject to SWM Plan Update decisions							0	0	0
	k. Groundwater Remediation (N. 48th Street)		UNKNOWN		0	0	0	0	0	0	0	
<b>Total - Project 2 (Occupation Tax)</b>			<b>239</b>	<b>89</b>	<b>37</b>	<b>317</b>	<b>192</b>	<b>158</b>	<b>307</b>	<b>217</b>	<b>415</b>	



## Solid Waste Facilities Plan

**TABLE ES-5 – LONG-TERM SOLID WASTE FACILITIES CAPITAL IMPROVEMENTS (CONT'D)**

Proj No.	Project Title	Proj Prio.	Long-Term Facilities Plan Expenditures (000's)								
			FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
1	<b>MSW Landfill - Bluff Road</b>										
	a. Landfill Expansions - Leachate Collection and Liner Systems	A	0	0	0	0	0	0	0	0	0
	b. Site Maintenance and Closure	A	260	260	270	280	290	300	310	320	330
	c. Final Cover & Landfill Gas Control Systems	A	404	3386	644	5732	580	5243	652	6675	24
	d. Leachate Collection & Treatment Facilities	B	0	0	0	0	0	0	0	0	0
	e. Site Re-Permitting	B	0	78	0	0	0	0	90	0	0
	f. Special Projects		0	0	0	0	0	0	0	0	0
	g. New MSW Landfill		0	331	809	96	361	2976	15329	8329	0
<b>Total - Project 1 (Landfill Revenue)</b>			<b>664</b>	<b>4055</b>	<b>1722</b>	<b>6108</b>	<b>1232</b>	<b>8520</b>	<b>16381</b>	<b>15324</b>	<b>354</b>
2	<b>Solid Waste Management Programs Other Than MSW Landfill</b>										
	a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	0	0	0	0	0	0	0	0	0
	b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	0	0	0	0	0	0	0	0	0
	c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	40	0	0	0	0	0	0	0	0
	d. Parks Development (N. 48th Street)	C	0	0	0	0	0	0	0	0	0
	e. Solid Waste Management Plan Update	B	94	0	0	0	0	109	0	0	0
	f. Future C&D Landfill Site	B	0	0	5618	96	99	186	0	3947	110
	g. Recycling Drop-Off Site Maint./Improv.	A	16	17	17	18	18	19	19	20	20
	h. Expansion of Recycling Drop-Off Program	A	72	74	0	79	0	84	0	89	0
	i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	96	0	102	0	108	0	115	0	122
	j. Convenience Center Transfer Station		0	0	0	0	0	0	0	0	0
	k. Groundwater Remediation (N. 48th Street)		0	0	0	0	0	0	0	0	0
	<b>Total - Project 2 (Occupation Tax)</b>			<b>319</b>	<b>91</b>	<b>5737</b>	<b>193</b>	<b>226</b>	<b>397</b>	<b>134</b>	<b>4056</b>



## Chapter 1 – Introduction

### Background

The City of Lincoln, Nebraska (City) and the surrounding County of Lancaster (County) developed a Lincoln-Lancaster Solid Waste Management Plan in 1994 (1994 Plan), which defined the solid waste management strategies, programs, and facilities. The 1994 Plan was updated in 2000 (2000 Plan Update) to document the progress achieved toward the goals established in the 1994 Plan.

The City determined the need for a long-term solid waste facilities plan that can provide general guidance in the annual planning process and identify critical issues that need to be addressed in future solid waste management plan updates. Consequently, this Solid Waste Facilities Plan (Plan) has been prepared to facilitate the annual budgeting and facility planning process. The solid waste planning area addressed in this Plan is the City-County service area (Service Area), which is contiguous with the County (see Figure 1-1).

This Plan identifies the current solid waste collection and diversion programs as well as capacities for the Service Area. It also provides historic data, current data, and future projections with respect to solid waste generation. This information has been used to provide projections for future planning decisions and system capacity requirements for new or expanded waste disposal and diversion facilities.

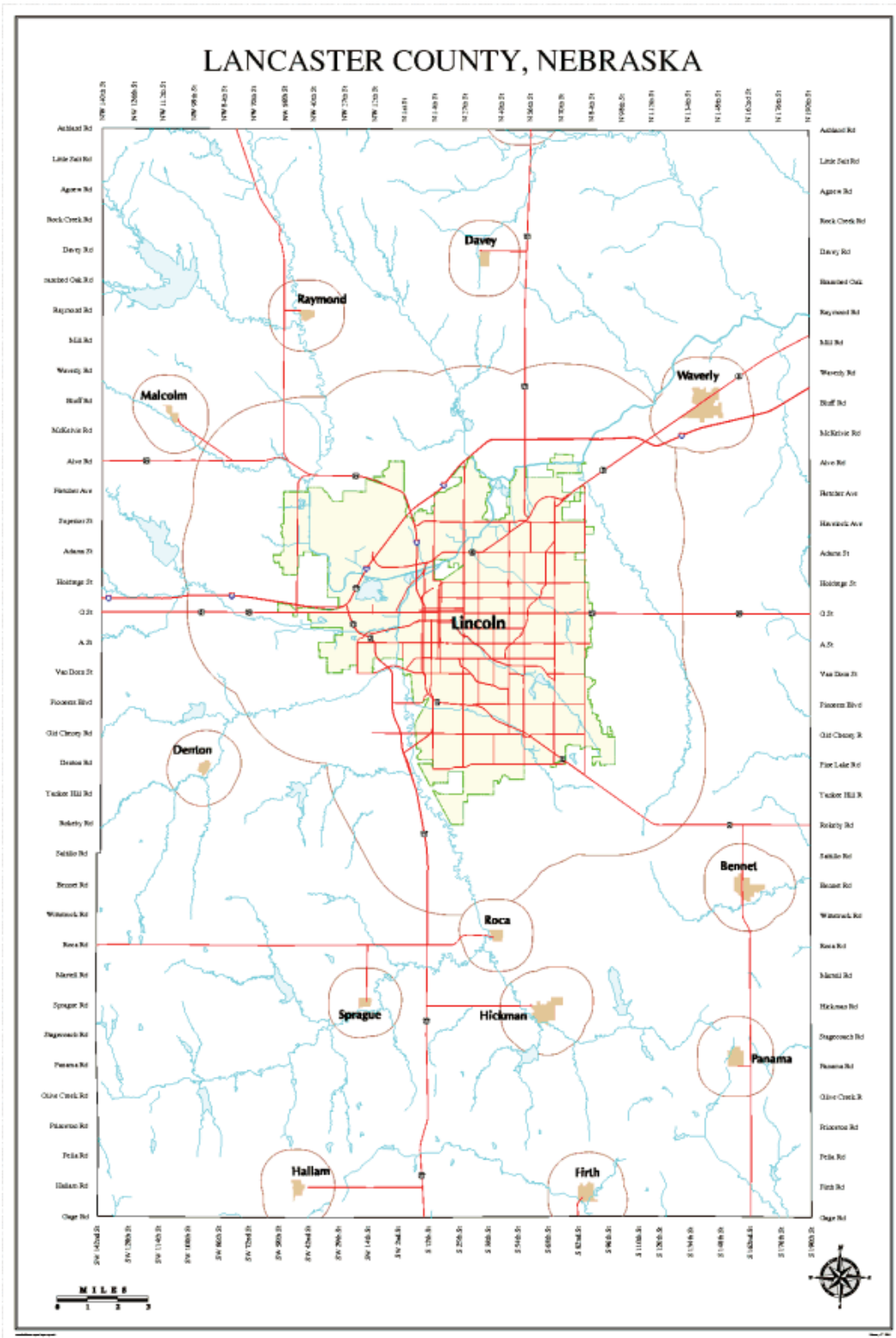
### Factors Affecting the Facilities Plan

#### *Regulatory Factors*

The principal regulations affecting the City's solid waste facilities are the following:

- ❖ Resource Conservation and Recovery Act (RCRA) – 40 Code of Federal Regulations (CFR) Parts 257 and 258, Solid Waste Disposal Facility Criteria (Subtitle D Rules)
- ❖ Clean Air Act and the 1990 Amendment (CAA) – 40 CFR Part 60, Subparts Cc and WWW, Standards of Performance for New Municipal Solid Waste Landfills and Emission Guidelines for Existing Municipal Solid Waste Landfill (Landfill Gas Rules)
- ❖ Clean Water Act – Title 119 National Pollution Discharge Elimination System (NPDES)
- ❖ Nebraska Department of Environmental Quality – Title 132, Integrated Solid Waste Management Regulations, Title 128 Hazardous Waste Rules and Title 129, Air Quality Regulations
- ❖ Lincoln Municipal Code, Chapter 8.32

FIGURE 1-1 – MAP OF LANCASTER COUNTY





### ***Resource Conservation and Recovery Act***

The regulations promulgated under RCRA deal with solid waste management practices and include separate requirements for hazardous waste disposal. Overseen by the U.S. Environmental Protection Agency, RCRA provides regulations to effectively manage solid waste from generation to disposal. Its operation principles were developed to protect public health and the environment, reduce or eliminate hazardous waste generation, conserve natural resources, and conserve energy. Any person or organization that deals with solid and hazardous waste, including the production, transportation, storage, or disposal of the waste, must adhere to these regulations. The regulations applicable to development and permitting of solid waste facilities under RCRA are defined in Chapter 5 of this Plan.

### ***Clean Air Act***

The CAA regulations, which became effective on March 12, 1996, establish standards for air quality and require all MSW landfills and for which construction began after May 30, 1991, and that have a design capacity of greater than 2.5 million cubic meters or 2.5 million megagrams (Mg), are subject to the New Source Performance Standards (NSPS). Existing MSW landfills for which construction commenced prior to May 30, 1991 are subject to Emissions Guidelines (EG). Operators of MSW landfills that exceed the design capacity thresholds are required to estimate the annual generation rate of Non-Methane Organic Compounds (NMOCs) from the facility. If the calculated rate exceeds 50 Mg NMOC per year, installation of an active LFG collection and control system is required. This rule also requires surface monitoring and reporting for methane recovery, which serves to ensure that the gas collection system is functioning properly. The installation and operation of a LFG collection and control system is required in areas of the landfill where the MSW has been in place for at least five years.

### ***Nebraska Department of Environmental Quality***

The Nebraska Department of Environmental Quality (NDEQ), Waste Management Division is composed of two sections and one unit: the Waste Management Section, the Remediation Section, and the Planning and Aid Unit. The Waste Management and Remediation Sections share responsibilities for the hazardous waste, Superfund, voluntary remediation, and integrated waste management programs. Several waste-related grant programs are administered by the Planning and Aid Unit.

State Implementation Plans (SIP) for incorporating federal environmental regulations have been submitted by the NDEQ and approved by the USEPA which delegate federal regulatory enforcement authority to the NDEQ. The Waste Management Division is responsible for the promulgation and enforcement of the State of Nebraska (State) and federal regulations related to waste management in the State.

### ***Population and Employment***

According to U S Census Bureau estimates, the City's population has increased by approximately 15 percent since the 1994 Plan was completed. Growth is expected to continue at a steady pace for the foreseeable future. Traditionally, waste generation projections have been estimated on the basis of per capita generation rates applied to resident population. However, employment also has a major impact on waste generation quantities. As population density increases and communities



## Solid Waste Facilities Plan

become more cosmopolitan, the business community expands as well, which increases commuter and shopping traffic into the community. This growth in business sector results in higher generation rates, which are based only on the resident population. This increase in per capita generation rates has been attenuated to a degree by increased recycling activity and waste diversion.

### ***Disposal Capacity Expansions***

The timing of landfill cell expansions will depend on the waste generation rates, population growth, and amount of waste diversion achieved through source separation and recycling. The timing for siting another landfill, transfer station, or recycling facility will depend on a number of factors, including changes in the population centroid as result of expanding community boundaries, the current site capacity for expansion, and how rapidly that site capacity is reached.

### ***Alternative Disposal Facilities***

A portion of the waste generated in the County is exported to surrounding landfills. The amount of waste diverted from the City solid waste facilities will have a significant impact on the type of solid waste facilities needed within the County, their associated capacities, and the timing of future capital improvements.

### ***Service Area Changes***

The City's current policy is to limit the Service Area for the City-provided facilities to the County boundaries. Future policy makers may decide to expand the Service Area beyond the County boundaries as the City expands or to improve the future economies of scale in the City-County operations.

## **Planning Goals and Objectives**

The purpose of the Plan is to:

- ❖ Provide an overview of the current solid waste practices, regulatory requirements, and City and County governing policies.
- ❖ Define Service Area characteristic and factors affecting the Plan and future management needs.
- ❖ Quantify the current wastes streams that need to be managed and project future quantities based on historical trends and demographic projections.
- ❖ Describe the existing waste management facilities and programs, including planned developments, provided by both the public and private sectors.
- ❖ Provide a management and planning guidance document for anticipated facility capital improvement requirements, future capacity needs, and future planning and community involvement.
- ❖ Serve as a summary for elected leadership and City managers.



## Chapter 2 – Planning Area Characteristics

Providing a plan to help guide the solid waste management services for the Service Area (see the map of the County in Figure 1-1) is a fundamental part of the Plan objectives. The land area and the types of facilities needed have a general correlation to population. Therefore, it can be assumed that an increase in the City-County population will require a proportional increase in facility capacity.

This chapter reviews existing population distribution and growth trends, and presents population projections and anticipated growth areas for a 25-year planning period. This planning period, beginning in 2006 and ending in 2030, was established in the 2030 Lincoln City-Lancaster County Comprehensive Plan (2030 Comprehensive Plan) developed in 2002, which is currently being updated in 2006. To provide the long-term projections required for this Solid Waste Facilities Plan, populations for a 30-year period, from 2000 through 2030, were projected based on historical U. S. Census Bureau data for the period 2000 to 2005. Using the projected population figures, City-County solid waste growth patterns were estimated and associated improvements to the Lincoln solid waste management systems were identified.

### Service Area

The solid waste planning area, also referred to as the Service Area, is Lancaster County (see Figure 1-1), which has a land area of approximately 840 miles. The County is located in southeastern Nebraska about 50 miles west of the Missouri River. Like other Nebraska counties, it is surrounded primarily by agriculture. The County has a large urbanized area, the State capitol City of Lincoln, in its geographical center. The City has corporate limits of approximately 80 square miles.

### Population Growth

In 2000, the total population of the County was 250,291. Lincoln is the second-largest community in the State, with 90 percent of the County's population, which represents 225,581 people. The County includes two other cities and ten villages, which represent 6,502 people or 2.60 percent of the population. The remaining population is considered rural and totals 18,208 people, or 7.27 percent of the County population.

#### *Historical Population Data*

The City-County area is growing. According to U.S. Census Bureau data the County's population grew by 17.2 percent between 1990 and 2000. Census Bureau estimates for 2005 had Lancaster's population at 264,814 and Lincoln's population at 238,302, which are a 4.5 percent and a 4.7 percent increase, respectively, since 2000. This population increase has also resulted in greater generation of solid waste in the County. Table 2-1 shows how the population grew in towns and villages in the County from 1990 to 2000.



**TABLE 2-1 – LANCASTER COUNTY POPULATION CHANGE BY COMMUNITY**

Towns and Villages	Population		Total Change	Total Percent Change	Annualized Percent Change
	1990	2000	1990-2000	1990-2000	1990-2000
Bennet	544	570	26	4.78%	0.47%
Davey	160	153	-7	-4.38%	-0.45%
Denton	161	189	28	17.39%	1.62%
Firth	471	564	93	19.75%	1.82%
Hallam	309	276	-33	-10.68%	-1.12%
Hickman	1,081	1,084	3	0.28%	0.03%
Malcolm	372	413	41	11.02%	1.05%
Panama	207	253	46	22.22%	2.03%
Raymond	167	186	19	11.38%	1.08%
Roca	84	220	136	161.90%	10.11%
Sprague	157	146	-11	-7.01%	-0.72%
Waverly	1,869	2,448	579	30.98%	2.74%
<b>Towns and Villages Total</b>	<b>5,582</b>	<b>6,502</b>	<b>920</b>	<b>16.48%</b>	<b>1.54%</b>
City of Lincoln	191,972	225,581	33,609	17.51%	1.63%
Balance of County	16,087	18,208	2,121	13.18%	1.25%
<b>Lancaster County</b>	<b>213,641</b>	<b>250,291</b>	<b>36,650</b>	<b>17.15%</b>	<b>1.60%</b>

Source: U.S. Census Bureau, Census 2000.

The number of people living in institutional housing also influences waste generation. This relates to the number of people living in correctional facilities and attending the University of Nebraska, Nebraska Wesleyan University, and Union College in the State capitol. The total enrollment in the three colleges, together with the enrollment in Southeast Community College and Hamilton College, was 29,849 in the year 2000.

**Population Projections**

Projections using the U.S Census historic data and projections from the City of Lincoln and Lancaster County Comprehensive Plan (2025 Comprehensive Plan) are shown in Table 2-2. The population projections from the 2025 Comprehensive Plan appear to be optimistic given the current census data; therefore future population projections used in this Solid Waste Facilities Plan were calculated using population estimates from the U.S. Census Bureau.

**TABLE 2-2 – PROJECTED POPULATION**

Year	U.S. Census Historic Estimates			2025 Comprehensive Plan		
	City of Lincoln	Lancaster County	Ave. Annual Growth Rate	City of Lincoln	Lancaster County	Ave. Annual Growth Rate
<b>2000</b>	<b>225,581</b>	<b>250,291</b>		<b>225,581</b>	<b>250,291</b>	
2001	228,390	253,234	1.18%	228,965	254,045	1.50%
2002	231,385	256,443	1.27%	232,399	257,856	1.50%
2003	234,677	260,007	1.39%	235,885	261,724	1.50%
2004	236,146	261,545	0.59%	239,423	265,650	1.50%
2005	239,287	264,814	1.25%	243,015	269,634	1.50%
2025	311,659	344,907	1.33%	327,306	363,159	1.50%
2050	433,641	479,902	1.33%	474,903	526,924	1.50%

Sources: U.S. Census Bureau, Census 2000 and published annual estimates through 2005. The 2025 Comprehensive Plan, prepared in 2002.



## Solid Waste Facilities Plan

Based on these projections, the County population is expected to be between 345,000 and 363,000 people by the year 2025 and between 480,000 and 527,000 people by the year 2050. The 2002 Comprehensive Plan assumed an annual population growth of 1.5 percent from the Census year of 2000 for its 25-year plan update. The Lincoln Planning Department is currently preparing an update to the 2030 Comprehensive Plan, but has not finalized its population projections. The U.S. Census population estimates for 2000 through 2005 show an average growth of 1.33 percent. For purposes of this Solid Waste Facilities Plan, therefore, population projections for 2005 to 2050 are based on the U.S. Census Bureau estimates.

### Employment

Waste generation tends to drop off during economic slumps and then recover along with the economy. In 1999, the U.S. Census Bureau reports that the Lancaster County median family income was \$53,676, which was above the national average family income of \$50,046 at that time. The median family income was up 47 percent from the 1990 median family income of \$36,467.

The unemployment rate for the County was approximately 3.5 percent in 2005, which was below the national average of 5.0 percent for that same year. Based on projections from Nebraska Workforce Development, Department of Labor 2004 data (see Table 2-3), the total number of jobs in the Lincoln region is expected to grow by 1.5 percent by 2012. This corresponds in general with population growth. The employment projections do not indicate a substantive change in the types of businesses that could impact the waste generation trends. Should this employment rate or category mix change, however, it could impact waste disposal requirements.

**TABLE 2-3 – FUTURE PROJECTIONS OF EMPLOYMENT, BY INDUSTRY**

NAICS Category	2002	2012	Difference	Change
Construction	8,224	9,451	1,227	1.50%
Manufacturing	16,605	17,181	576	0.30%
Retail Trade	16,596	18,996	2,400	1.40%
Transportation and Warehousing	8,448	9,186	738	0.90%
Finance and Insurance	8,717	9,502	785	0.90%
Prof, Scientific, and Tech	7,900	10,093	2,193	2.80%
Admin - Support - Waste Mgmt - Remediation	6,795	7,952	1,157	1.70%
Educational Services	17,797	21,333	3,536	2.00%
Health Care and Social Assist.	18,417	23,421	5,004	2.70%
Accommodation and Food	12,768	14,812	2,044	1.60%
Other (except Public Admin)	12,067	14,415	2,348	1.90%
Government	14,606	15,830	1,224	0.80%
<b>Total Lincoln Region:</b>	<b>166,552</b>	<b>191,451</b>	<b>24,899</b>	<b>1.50%</b>
Manufacturing	16,605	17,181	576	0.30%
Commercial	149,947	174,270	24,323	16.20%

**Notes:**

Under the Workforce Investment Act, the Lincoln region includes the Nebraska counties of Lancaster and Saunders.

NAICS stands for North American Industry Classification System.

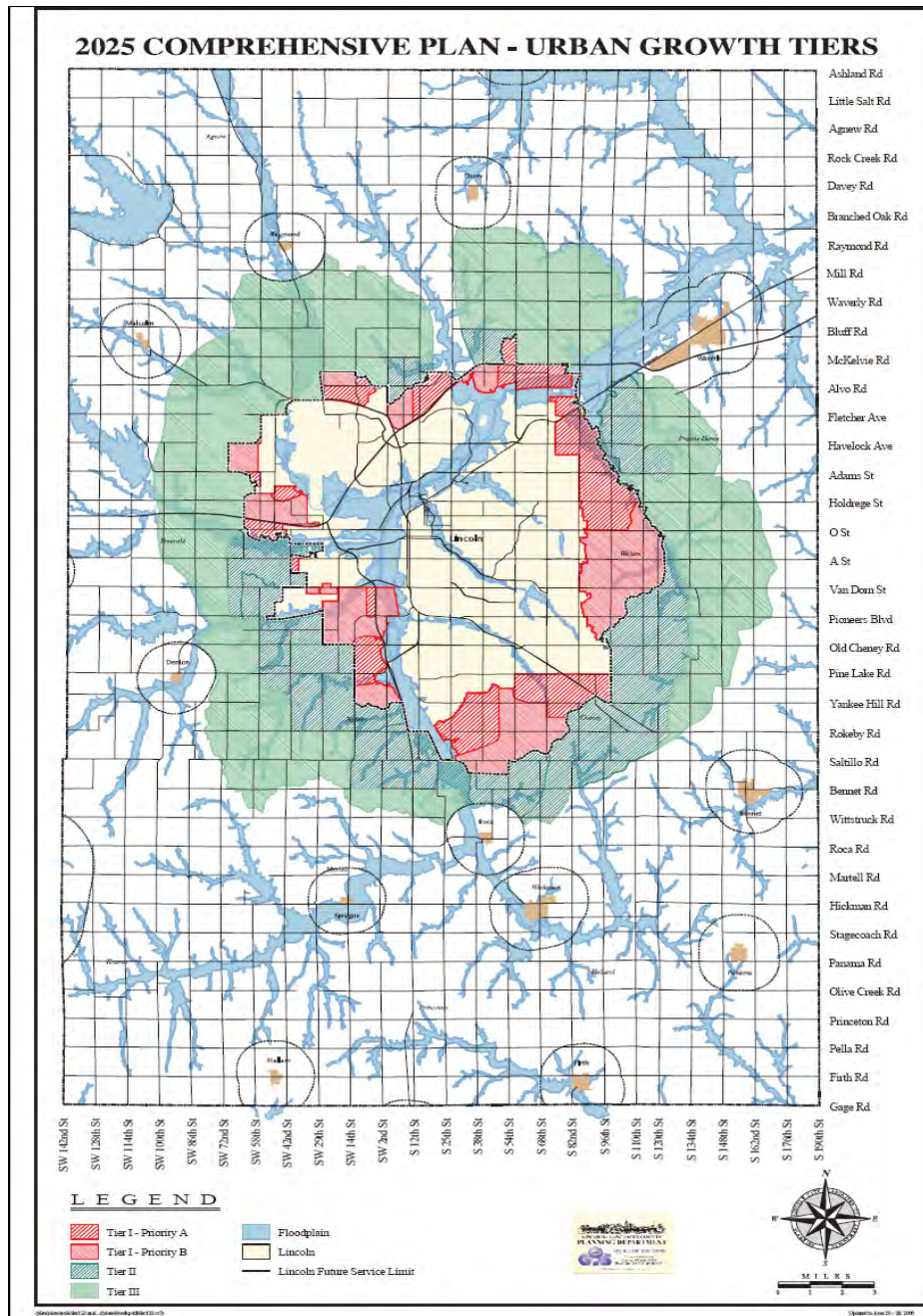
Industry totals and rollups may not be additive due to the disclosure suppression requirements in small industries.

**Source:** Nebraska Workforce Development, Department of Labor, Labor Market Information, September 2004.

**Urban Growth Patterns**

The City is growing in population and in land area. According to the 2025 Comprehensive Plan, the City has projected a tiered growth pattern which is mostly to the south and east, in the near term (Figure 2-1). This indicates a potential demand for future expansions of citizen waste and recycling drop-off locations in the south and east portions of the City. Given these growth projections, a new transfer station site located south of the City might be considered.

**FIGURE 2-1 – LINCOLN LANCASTER URBAN GROWTH PROJECTIONS**





## Chapter 3 – Waste Quantities and Projections

### Waste Generation

#### *Historical Waste Generation*

The Municipal Solid Waste (MSW) generation from residential commercial and light industrial sources in the County has been fairly steady over the last 13 fiscal years (FYs). The City’s fiscal year begins on September 1. There has been a very slight increase because of the population growth, while the per capita refuse generated per year has been on a slight decline over the same period. The total amount of MSW generated in the City was 451,939 tons of waste in FY2005, which included landfilled waste, exported tons, public recycling programs, and private recycling activities (see Table 3-1). Beginning in about FY1999, some of the waste generated in the County was exported to other landfills. The amount of waste exported was not documented until the implementation of an ordinance enacted by the City Council requiring the weighing of all waste prior to export in June 2003.

**TABLE 3-1 – HISTORICAL MSW QUANTITIES (TONS)**

FY	MSW (tons)	Exported Waste (tons)	Public Recycling (tons)	Private Recycling (tons)	Percent Recycled	MSW Generated (tons)	Per Capita Generation (lbs/yr)
92-93	258,828		55,366	59,665	30.8%	373,859	3,402
93-94	265,414		50,550	70,264	31.3%	386,228	3,456
94-95	257,957		48,760	81,190	33.5%	387,907	3,440
95-96	265,196		54,337	98,696	36.6%	418,229	3,657
96-97	284,536		53,978	105,590	35.9%	444,104	3,846
97-98	275,512		144,087	62,621	42.9%	482,220	4,133
98-99	286,322		54,475	119,220	37.8%	460,017	3,906
99-00	289,542		51,424	90,313	32.9%	431,279	3,629
00-01	278,351		51,625	63,268	29.2%	393,244	3,131
01-02	265,027		57,537	60,589	30.8%	383,153	3,022
02-03	275,049	10,174	60,283	61,707	30.0%	407,213	3,166
03-04	282,263	29,513	66,725	83,168	32.5%	461,669	3,538
04-05	280,105	30,106	66,027	83,168	32.5%	459,406	3,445
					<b>33.6%</b>	<b>Average</b>	<b>3,521</b>

Source: Lincoln Department of Public Works & Utilities, Wastewater and Solid Waste Operations Division Annual Summaries.

#### *Residential Waste*

The residential waste delivered to the Bluff Road Landfill over the last five years equaled approximately 697,000 tons. This represents approximately fifty percent of the delivered waste.

**TABLE 3-2 – RESIDENTIAL AND COMMERCIAL WASTE FY2000-2005**

Combined Totals	Total (tons)	Residential Waste (tons)	Commercial Waste (tons)
Trans. Station	38,556	34,590	3,967
Bluff Road Landfill	1,352,508	662,303	690,206
<b>Grand Total</b>	<b>1,391,065</b>	<b>696,892</b>	<b>694,172</b>
<b>Percent of Total</b>		<b>50.1%</b>	<b>49.9%</b>

Notes: (1) Tonnage disposed at the Bluffs Road Landfill only



Household hazardous waste collections from 1994 to 2005 totaled 763,888 pounds (lb), with 18,595 participants, for an average weight of 63,657 lb per year and an average number of participants of 1,550 per year. The highest collection year since 1994 was 2004, with a total of 91,847 lb collected; the lowest was 1996, with a total of 41,049 lb collected. The highest number of participants occurred in 2002, with a total of 1,944 participants, and the lowest in 1995, with 1,112 participants.

**Commercial and Industrial Waste**

The total commercial and residential waste collections have been similar in numbers over the last five fiscal years. As can be seen in Table 3-2, above, the commercial waste represented approximately 50 percent of the total waste delivered to the Bluff Road site and the North 48<sup>th</sup> Street site combined over the last five years. The commercial waste delivered to both the North 48<sup>th</sup> Street and Bluff Road sites averaged 278,198 tons per year.

**Construction and Demolition Waste**

The construction and demolition (C&D) waste acceptance rates at the North 48<sup>th</sup> Street site, as shown in Table 3-3, have fluctuated since FY1993, with a peak of 356,764 tons in FY1994 and a low of 61,305 tons in FY2001. Since FY2001, C&D waste has increased and is generally expected to increase at an average rate of 1 to 2 percent per year. However, C&D waste is closely related to economic activity and will fluctuate greatly from year to year, so the general trends may not be very evident.

**TABLE 3-3 – HISTORICAL C&D QUANTITIES (TONS)**

FY	C&D Disposed (tons)	C&D Recycling (tons)	% Recycled	C&D Generated (tons)	Per Capita Generation (lbs/yr)	County Population
92-93	269,201	154,500	36.5%	423,701	3,855	219,803
93-94	356,764	181,250	33.7%	538,014	4,815	223,484
94-95	167,405	136,000	44.8%	303,405	2,691	225,532
95-96	112,379	213,265	65.5%	325,644	2,847	228,727
96-97	92,868	324,107	77.7%	416,975	3,611	230,937
97-98	88,341	232,800	72.5%	321,141	2,752	233,354
98-99	101,682	311,513	75.4%	413,195	3,509	235,537
99-00	86,760	394,900	82.0%	481,660	4,053	237,657
00-01	61,305	330,548	84.4%	391,853	3,120	251,190
01-02	88,227	373,007	80.9%	461,234	3,638	253,552
02-03	78,649	261,128	76.9%	339,777	2,642	257,220
03-04	98,174	118,570	54.7%	216,744	1,661	260,995
04-05	76,746	368,591	82.8%	445,337	3,339	266,734
			66.7%	<b>Average</b>	3,272	

Source: Lincoln Department of Public Works & Utilities, Wastewater and Solid Waste Operations Division Annual Summaries.

**Special Waste**

The amount of special waste (such as asbestos, ash, biosolids, contaminated soils) has been constant over the last 13 fiscal years. The amount of special waste deposited at the Bluff Road site averages approximately 12,000 tons per year. Until FY1993, the City disposed of biosolids and liquid wastes in the Bluff Road Facility. These special wastes are currently land applied in order to recycle the nutrients back into the soil.



***Waste Generation Rate***

The population of the City and the County has increased by 16.6 percent from 1995 to 2005, while the MSW waste generation increased by approximately 11.3 percent over the same period. However, the average MSW per capita generation rate has fluctuated around an average of approximately 3,400 lbs per year over the last 13 years. This quantity of MSW is expected to keep increasing over the next 25 years in close correlation to the growth in population. Although C&D waste is closely tied to economic factors and construction activity, the per capita generation rate for C&D waste has averaged approximately 3,300 lb per year over the last 13 years.

***Waste Diversion Rates***

Several waste diversion programs have been implemented in the County in an effort to decrease the amount of waste going into the landfills. The programs consist of recyclable drop-off locations, private recycling initiatives, compost facilities, appliance de-manufacturing and scrap metal recycling.

The total recycling rates have been fairly steady since the mid-1990s, fluctuating from about 40 percent to about 59 percent, which averages to a rate of approximately 54 percent. This rate includes public recycling (drop-off facilities, organic recycling, and sludge recycling), and private recycling (traditional recycling as well as C&D recycling). The average recycling rate for MSW and C&D has been approximately 34.5 percent and 66.7 percent, respectively. However, C&D recycling activity has improved dramatically over the same period, and diversion currently ranges between 70 to 80 percent.

The Lincoln-Lancaster County Health Department collects over 45,000 lbs (22.5 tons) of household hazardous waste each year.

**Waste Disposal Quantities**

The historical MSW disposal quantities received at the Bluff Roads Landfill are shown in Table 3-4.

**TABLE 3-4 – BLUFF ROAD LANDFILL TONS**

<b>FY</b>	<b>MSW (tons)</b>	<b>Special Waste (tons)</b>	<b>Transfer Station (tons)</b>	<b>Total Waste (tons)</b>
92-93	233,671	12,857	12,300	258,827
93-94	240,383	11,865	13,166	265,414
94-95	237,998	8,395	11,564	257,957
95-96	237,670	15,349	12,177	265,196
96-97	252,101	17,055	15,380	284,536
97-98	252,673	11,998	10,841	275,512
98-99	261,026	14,018	11,278	286,322
99-00	268,539	12,204	8,799	289,542
00-01	259,561	11,617	7,173	278,351
01-02	243,655	12,863	8,509	265,027
02-03	255,326	11,775	7,948	275,049
03-04	262,116	12,556	7,591	282,263
04-05	261,950	10,950	7,205	280,106

**Source:** Lincoln Department of Public Works & Utilities, Wastewater and Solid Waste Operations Division Annual Summaries.



## Solid Waste Facilities Plan

The County’s increasing population has led to an increase in waste needing disposal at the landfill, despite the increase in waste diversion by recycling and waste export. The special waste tonnage has been relatively constant over the analysis period. The transfer station tonnages show a dramatic drop in FY2000. Considering that there is no corresponding change in the total MSW, the trend suggests an increased use of residential collection service contracts in the area.

The historical C&D disposal quantities received at the North 48<sup>th</sup> street site are shown in Table 3-5. The average tons per day received at the site dropped substantially due to the increase in disposal rates in 1995. Since this waste is directly tied to economic activity in the region, the future C&D disposal quantities are likely to be very volatile.

**TABLE 3-5 – NORTH 48<sup>TH</sup> STREET C&D TONS**

FY	Beneficial		Total Tons	Ave. TPD
	Fill Tons	C&D Tons		
92-93	251,543	17,658	269,201	750
93-94	327,100	29,664	356,764	994
94-95	148,876	18,529	167,405	466
95-96	91,322	21,057	112,379	313
96-97	48,855	44,013	92,868	259
97-98	48,105	40,236	88,341	246
98-99	46,164	55,518	101,682	283
99-00	53,613	33,147	86,760	242
00-01	43,795	17,510	61,305	171
01-02	74,160	14,067	88,227	246
02-03	59,438	19,757	79,195	221
03-04	77,321	20,853	98,174	273
04-05	42,999	33,747	76,746	214

Source: Lincoln Department of Public Works & Utilities, Wastewater and Solid Waste Operations Division Annual Summaries

### ***Waste Diversion Projections***

The total weight of recycled MSW has increased from an average of approximately 2,200 lb per person per year for FY1989 to an annual average of about 3,300 lb per person in FY2005. The MSW recycling diversion rate appears to have peaked in FY1998 and averaged approximately 3,416 lb per person in the period between FY1993 and FY2005. Reported C&D recycling reached a low of 1,661 lb per person in FY2004 but averaged 3,272 lb per person between FY1993 and FY2005. The recycling rate trend appears to have peaked at this point but could potentially increase if additional drop-off facilities or other programs options are developed under an updated solid waste management plan.

### ***Waste Disposal Projections***

Based on the historical data on waste generation, waste diversion, and the County population projections, the quantities of generated waste, recovered recyclables, and residual disposal were estimated for the next 25 years, as shown in Table 3-6.



TABLE 3-6 – WASTE DISPOSAL PROJECTIONS

FY	County Population (1)	Waste Generation			Recycled Waste (tons) (5)	Waste Disposal Estimate		
		MSW (tons) (2)	Special Waste (tons) (3)	C&D Waste (tons) (4)		MSW (tons) (6)	Special Waste (tons)	C&D Waste (tons) (7)
99-00	250,291	425,495	12,000	412,980	456,531	278,699	12,000	103,245
00-01	253,234	430,498	12,000	417,836	461,899	281,976	12,000	104,459
01-02	256,443	435,953	12,000	423,131	467,752	285,549	12,000	105,783
02-03	260,007	442,012	12,000	429,012	474,253	289,518	12,000	107,253
03-04	261,545	444,627	12,000	431,549	477,058	291,230	12,000	107,887
04-05	264,814	450,184	12,000	436,943	483,021	294,870	12,000	109,236
05-06	268,336	456,171	12,000	442,754	489,445	298,792	12,000	110,689
06-07	271,905	462,238	12,000	448,643	495,955	302,766	12,000	112,161
07-08	275,521	468,386	12,000	454,610	502,551	306,793	12,000	113,653
08-09	279,186	474,616	12,000	460,656	509,235	310,873	12,000	115,164
09-10	282,899	480,928	12,000	466,783	516,007	315,008	12,000	116,696
10-11	286,661	487,324	12,000	472,991	522,870	319,197	12,000	118,248
11-12	290,474	493,806	12,000	479,282	529,825	323,443	12,000	119,821
12-13	294,337	500,373	12,000	485,657	536,871	327,745	12,000	121,414
13-14	298,252	507,028	12,000	492,116	544,012	332,104	12,000	123,029
14-15	302,219	513,772	12,000	498,661	551,247	336,521	12,000	124,665
15-16	306,238	520,605	12,000	505,293	558,579	340,996	12,000	126,323
16-17	310,311	527,529	12,000	512,013	566,008	345,532	12,000	128,003
17-18	314,438	534,545	12,000	518,823	573,536	350,127	12,000	129,706
18-19	318,620	541,655	12,000	525,724	581,164	354,784	12,000	131,431
19-20	322,858	548,859	12,000	532,716	588,893	359,502	12,000	133,179
20-21	327,152	556,158	12,000	539,801	596,725	364,284	12,000	134,950
21-22	331,503	563,555	12,000	546,980	604,662	369,129	12,000	136,745
22-23	335,912	571,051	12,000	554,255	612,704	374,038	12,000	138,564
23-24	340,380	578,646	12,000	561,627	620,853	379,013	12,000	140,407
24-25	344,907	586,342	12,000	569,096	629,110	384,054	12,000	142,274
25-26	349,494	594,140	12,000	576,665	637,477	389,162	12,000	144,166
26-27	354,142	602,042	12,000	584,335	645,956	394,338	12,000	146,084
27-28	358,852	610,049	12,000	592,107	654,547	399,582	12,000	148,027
28-29	363,625	618,163	12,000	599,982	663,252	404,897	12,000	149,995
29-30	368,461	626,384	12,000	607,961	672,074	410,282	12,000	151,990

Notes:

- Population projections based on extrapolation of U.S Census population estimates for 2000 through 2005. 1.33%/year
- MSW projections are based on an estimated 3,400 lbs/person-yr
- Special Waste projections are estimated at 12,000 tons-yr
- C&D waste projections are based on an estimated 3,300 lbs/person-yr
- Recycled materials are estimated based on 34.5% of MSW & 75% of C&D waste
- MSW generation minus recovered materials

For these estimates, it is assumed that there are no changes in the recycling programs and that the per capita waste generation rates for both MSW and C&D wastes continue at the historical average levels. The recycling quantities are based on available historical recycling data, including drop-off materials, organic recycling of compost, wood chips, and land-applied biosolids as well as reported private recycling. It is also assumed that the average special waste generation per year remains relatively constant over the analysis period. Considering that special waste quantities have fluctuated but not changed substantially over the last 15 years, these quantities are expected to remain relatively flat during the 25-year planning period.



## Chapter 4 – Solid Waste Facilities

### Solid Waste Collection and Handling Practices

#### *Waste Haulers' Service Trends*

None of the municipalities in the County provide either public or franchise collection service for solid waste. All waste collection in the City-County region is provided by 48 licensed private waste haulers (10 commercial, 32 residential, and 6 residential and commercial). Residential and commercial collection services are provided by the haulers under an open competition system. Residents and businesses can also elect to self-haul their own waste.

The 10 waste haulers recording the largest amount of activity in FY2005 accounted for 48 percent of the total financial transactions at City disposal sites, and 59 percent in FY2004. Cash transactions represented approximately 8 percent of the total in both FY2005 and FY2004.

#### *Collection*

The majority of un-recycled commercial and residential waste is hauled to the Bluff Road Landfill. Lawn service companies and waste haulers also deliver source-separated yard waste (defined as grass and leaves) to a composting facility at the Bluff Road site. A small vehicle transfer station provided for use by the self-haul customers is located at the North 48<sup>th</sup> Street site. C&D waste is delivered to and disposed of at the North 48<sup>th</sup> Street site as well. Yard waste and other compostable waste delivered to the transfer station at the North 48<sup>th</sup> Street site are taken to the Bluff Road site for composting.

#### *Recycling*

The City-County philosophical goal is to provide public drop-off recycling sites for the traditional residential recycled materials (newsprint, aluminum, glass, polyethylene terephthalate [PET] and high-density polyethylene [HDPE] plastic, glass, tin, paperboard and old corrugated cardboard [OCC], and mixed paper) and for materials banned from disposal facilities under the 1992 Nebraska Integrated Solid Waste Management Act (the Act). Banned materials are grass and leaves, used oil, automobile batteries, appliances, and tires (see the Land Disposal Bans section of Chapter 5, Solid Waste Management Regulations). The City and County encourage citizens to contract with their hauler for recycling collection services or use the City provided recycling drop-off sites.

The North 48<sup>th</sup> Street site has drop-off areas for used oil, tires, automobile batteries, yard waste, and appliances (the site includes an appliance de-manufacturing facility where Freon, mercury switches, and polychlorinated biphenyl (PCB) capacitors are removed). These materials are generally recycled through contracts with private firms.

The Bluff Road Landfill has separate drop-off areas for appliances, tires, and automobile batteries and for yard waste (at the compost facility). The appliances are transported off site by a private firm for removal of Freon and PCB capacitors prior to recycling. The total tire collection at the Bluff Road site since September 2001 is approximately 100 tons. The tire collection has slightly decreased during that time period. The tires are collected and processed by a local recycler, who uses tire chips for rural sanitary sewer drainage fields.



Private haulers also offer subscription curbside recycling for residential and business customers, and buyback centers, as discussed later in this chapter.

***Description of Waste Diversion Programs***

***Drop-off Facilities***

Lancaster County has a network of 29 recycling drop-off sites, 23 of which are located in the City and six of which are located in the County outside of the City. Close to 40 percent of the people in Lincoln use the drop-off sites. Of the 23 City drop-off sites, 18 are multi-material sites which accept newsprint, aluminum cans, PET (#1) and HDPE (#2) plastic containers, clear glass, green glass, brown glass, steel cans (tin), OCC, and mixed paper. The remaining five sites collect newspaper only. The six County sites, in the Cities of Hickman and Waverly as well as the Villages of Bennet, Davey, Firth, and Panama, are all multi-material sites. Table 4-1 shows the five-year tonnages of materials collected at the County drop-off sites.

**TABLE 4-1 – FIVE-YEAR SUMMARY OF MATERIAL TONNAGES AT PUBLIC DROP-OFF SITES**

<b>FY</b>	<b>Newsprint</b>	<b>Alum.</b>	<b>PET HDPE (Clear)</b>	<b>Glass</b>	<b>Other Metals (Tin)</b>	<b>Paperboard &amp; OCC</b>	<b>Mixed Paper</b>	<b>Total Tons</b>	<b>Percent Change Previous Year</b>
00-01	3,317	27	178	577	117	732	1,239	6,187	-2.30%
01-02	3,222	25	176	569	118	696	1,236	6,042	-2.30%
02-03	3,219	32	190	594	133	738	1,349	6,065	0.40%
03-04	3,154	35	200	613	123	739	1,436	6,100	0.60%
04-05	3,161	36	230	628	126	865	1,511	6,555	7.50%
Totals:	16,073	155	230	2,981	617	3,770	6,771	30,949	

The City of Lincoln also provides a Christmas tree recycling service. Christmas trees can be dropped off at eight sites located around the City. In the last 18 years, the City has recycled over 164,515 trees (approximately 2,499 tons), with an annual average of 9,140 trees (approximately 139 tons).

The City’s drop-off siting philosophy was based on each site serving a 1-mile radius, with an average goal of 8,500 people per site. Property owners donate land for the site with annual contracts, and the City pays for maintaining and improving the site. If possible, the City prefers to co-locate on public property, and if no public property is available, to locate in industrial zones or regional shopping centers, and neighborhood shopping centers

The recycling drop-off sites in southeast Lincoln are the largest and receive the greatest amount of material because more of the population resides in the southern part of the City. The existing sites cannot readily be expanded to accept greater material quantities. The siting of additional drop-off sites has become very difficult in commercial areas due to the amount of space required for a drop-off site, increased traffic volumes once the site is operational, added noise in the area, and concerns about litter and illegal dumping.

Since FY1990-1991, the drop-off facilities have collected 73,347 tons of recyclables, including newsprint, aluminum, PET (#1) and HDPE (#2 clear) plastic, glass, other metals (tin), paperboard and OCC, and mixed paper. The rate of collection has been increasing each year, reaching a high



of 6,555 tons of recyclables in FY2004-2005 (see Table 5-1), an increase over the previous year and the previous high.

The City’s current criteria for siting recycling drop-off areas are as follows:

- ❖ Located in high visibility/high traffic areas,
- ❖ Serving an average of 8,500 people,
- ❖ Serving no more than a 4-square-mile area (that is, a 1-mile radius from site), and
- ❖ Located within an urban environment

***Private Recyclable Processing Capacity***

The City’s private recycling collection system consists of five curbside recyclers (three waste haulers and two private recyclers) for residential areas. In commercial areas, OCC collection is provided by three waste haulers, three private local recyclers, and two regional private recyclers, while office paper collection is provided by three private recyclers. There are also three buyback center locations in the City for aluminum cans; two of the centers also accept other recyclables, one takes scrap metals, and one takes newspaper. In addition, there is a site just for the collection of scrap metals.

C&D contractors deliver the debris from their construction sites to various processing sites in the region that recover salvageable materials such as metals, concrete, and asphalt.

An annual survey of private recyclers collects data on the private-sector recycling activities, providing an estimate of the private-sector recycling quantities. The following table summarizes the reported data.

**TABLE 4-2 – PRIVATE-SECTOR RECYCLING TONNAGES**

	2000	2001	2002	2003	2004	2005
Ferrous	33,427	23,941	27,688	28,093	50,153	59,884
Other Metals	2,522	1,173	3,060	3,367	4,505	5,008
Aluminum	3,044	1,622	2,082	814	2,187	2,803
Newsprint	5,245	3,899	255	7,217	2,464	2,063
Mixed Paper	6,403	1,028	721	5,441	4,090	739
Paperboard/OCC	19,581	16,010	13,618	10,535	13,389	7,781
High-Grade Paper	6,677	10,657	7,990	3,921	5,352	7,876
PET & HDPE	238	173	155	399	175	93
Other Plastics	0	0	124	0	0	0
Glass	3,257	4,321	2,649	1,354	853	94
Tires	0	3	0	0	0	300
Other	9,919	441	0	0	0	7
<b>Subtotal Trad. Recycling</b>	<b>90,313</b>	<b>63,268</b>	<b>60,642</b>	<b>61,141</b>	<b>83,168</b>	<b>86,648</b>
<b>C&amp;D Waste</b>	<b>394,900</b>	<b>330,548</b>	<b>373,007</b>	<b>261,128</b>	<b>118,570</b>	<b>368,591</b>
<b>Overall Totals</b>	<b>485,213</b>	<b>393,816</b>	<b>433,649</b>	<b>322,269</b>	<b>201,738</b>	<b>455,239</b>

**Source:** Lincoln Department of Public Works Solid Waste Management Annual Summaries.

A 40,000-square-foot material processing facility processes all of the recyclables collected through the City’s recycling drop-off sites as well as recyclables from private businesses. The facility averages roughly 4,000 tons of material per month, which is estimated to be approximately 60 percent of its capacity.



The total private recycling has varied over the years. The average amount of private recycling has been 302,395 tons per year since 1990. This number includes the total from recycling ferrous metals, other metals, aluminum, newsprint, mixed paper, paperboard and OCC, high-grade paper, PET, clear and color HDPE, PET (#1), other plastics, glass, tires, other items, and C&D waste.

***Composting Facilities***

The yard waste composting facility at the Bluff Road Site is designed for use by commercial refuse haulers and commercial lawn maintenance companies that haul yard wastes. Clean brush or tree wastes which are free of soil and other debris may also be taken to this facility. However, small vehicles cannot dispose of other waste items at this site.

The City also accepts yard waste and grinds wood chips at the North 48<sup>th</sup> Street Transfer Station. Yard waste is transported to the compost facility at the Bluff Road Landfill.. The chips are distributed to the public or transported to the composting operation. Wood chips can be picked up by the public from both the North 48<sup>th</sup> Street Site and Bluff Road Site.

The composting facility at the Bluff Road Site processes approximately 20,000 tons per year of grass, leaves, and brush (see Table 4-3). The facility produces approximately 10,000 cubic yards (CY) of finished compost and 4,500 to 6,000 tons of wood chips per year.

**TABLE 4-3 – ORGANIC RECYCLING TONNAGES AT COMPOST FACILITY**

<b>FY</b>	<b>Grass and Leaves</b>	<b>Brush</b>
00-01	14,639	5,225
01-02	13,178	4,999
02-03	14,975	5,047
03-04	15,138	4,808
04-05	13,549	5,334
<b>Total:</b>	<b>71,479</b>	<b>25,413</b>

**Source:** Lincoln Department of Public Works Solid Waste Management Annual Summaries

***De-Manufacturing Facilities***

Until April 2005, appliances from the disposal facilities were processed by a private firm for the removal of Freon and PCB capacitors prior to scrap metal recycling. Currently, appliances are processed at the City-owned de-manufacturing facility located at the North 48<sup>th</sup> Street site. The North 48<sup>th</sup> Street Transfer Station handles all “white good” appliances, which include washers and dryers, refrigerators, freezers, window air conditioners, hot water heaters, dishwashers. Staff inspects the appliances and removes any Freon, PCB capacitors and mercury switches. They then place the de-manufactured appliances into roll-off boxes that are taken to a private scrap facility. The City plans to purchase a roll-off truck so that appliances received at the Bluff Road site can be taken to the North 48<sup>th</sup> Street appliance building as well. White goods collected at the Bluff Road site are currently shipped directly to a local scrap metal processor for de-manufacturing.

In the time period between FY2001 until FY2005, the City shipped an average of 255 loads (approximately 814 tons) per year of scrap received at both landfills combined. In FY2005, the



disposal facilities received 1,715 Freon-containing appliances and processed 770 tons of scrap metal.

### ***Description of Transfer Station Operations***

The small vehicle transfer station is located at 5101 North 48<sup>th</sup> Street, approximately 1 mile north of 48<sup>th</sup> Street and Superior Street. This transfer station is used by cars, pickups, trailers, or other small vehicles that have maximum cargo box dimensions of 6 feet by 8 feet by 5 feet high. Grass and leaves, brush, appliances, metals, and tires must be sorted out and placed in designated storage areas on the site for recycling. Waste oil and lead acid batteries are also separated for recycling at this facility.

The number of vehicles using the transfer station has dropped over the years to approximately 27,987 vehicles in FY2005. The transfer station has averaged approximately 10,000 tons of waste annually over the last 16 years but the average has decreased to 7,871 tons in the last six years. This drop in tonnage is likely due to increased urbanization, resulting in increased collection service participation rates.

On a busy Saturday, the transfer station will receive two to three semi-trailer truck loads of waste; on Sundays, one to two loads; and on a typical weekday, only one load. All loads from the transfer station are weighed and recorded.

## **Description of Solid Waste Disposal Facilities**

### ***Bluff Road Landfill***

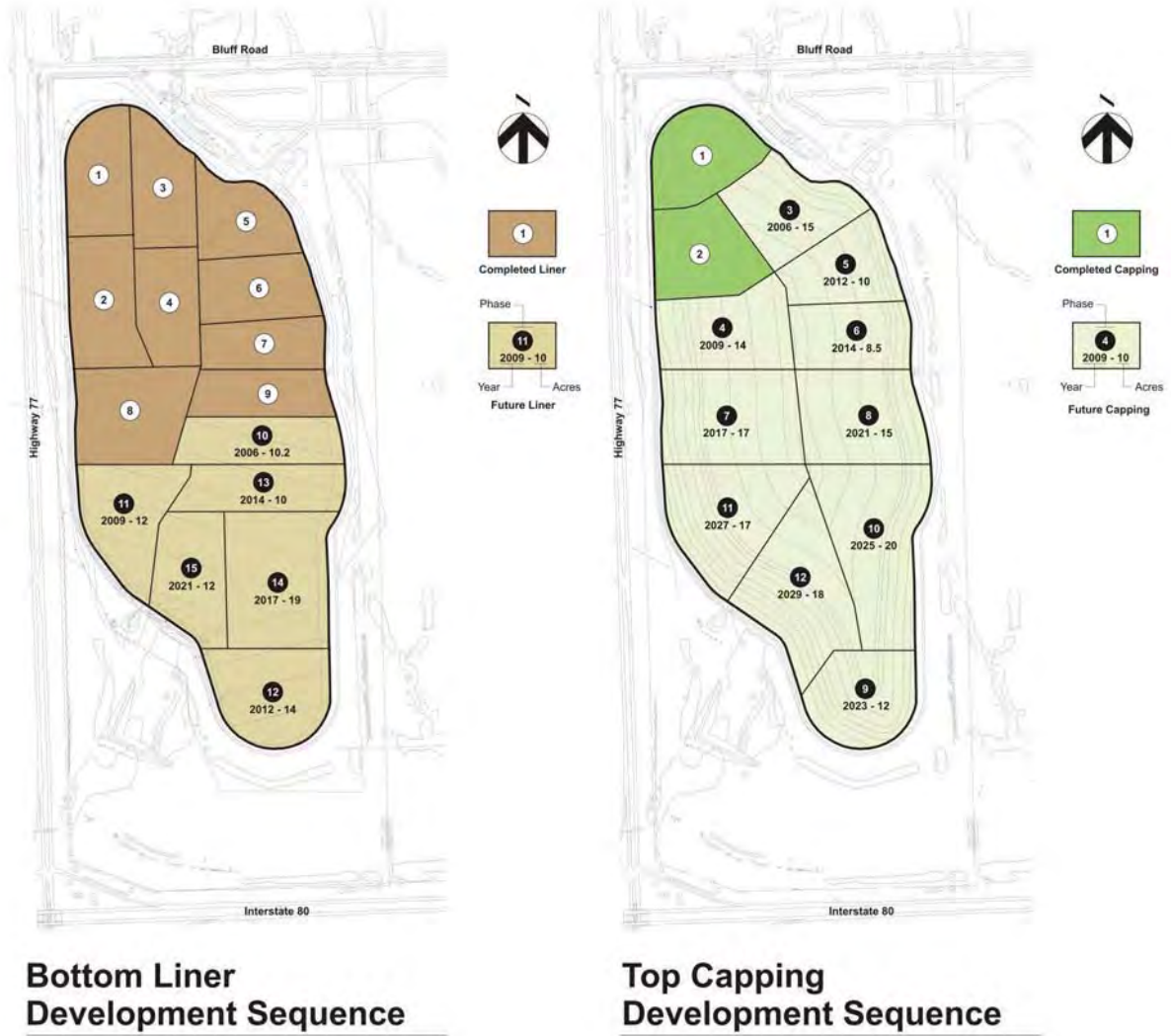
The Bluff Road Landfill is the only MSW landfill permitted in the County and has been in operation since October 1988. It is located at 6001 Bluff Road. The City owns approximately 360 acres of land. This landfill is used by commercial refuse haulers or customers hauling materials in large trucks and trailers with cargo box dimensions larger than 6 feet by 8 feet by 5 feet high. Yard waste, appliances and tires must be separated from other wastes and delivered to the designated areas. All loads entering this facility must be covered.

Facilities on the site include the scale office and the maintenance facility. A scale with 60-ton capacity and a 70-foot by 10-foot platform, located adjacent to the scale office, measures the tonnages received from commercial waste haulers. The scale is semi-annually calibrated in accordance with the State of Nebraska, Department of Agriculture, Weights and Measures Division regulations.

At capacity, the current landfill will cover 171 acres of the 360-acre location and contain over 23 million CY of waste (excluding the liner system and final cover). Based on projections in the 2002 permit, Lincoln's landfill is expected to reach capacity in 2030. Based on 2002 projections for 2006, the remaining capacity is 14,899,850 CY (excluding final soil cover) of landfill volume.

Landfill operations are now in the Phase 9 area of the site. Future cell expansions will occur in the areas directly to the east and south of the current landfill area. Currently, 94 acres of the 171 permitted acres are lined, and 2006 Phase 10 construction is adding 10 acres of liner with leachate collection piping. A total of 15 construction phases, ranging in size from 9 to 18 acres and averaging 12 acres, are planned for the current permitted landfill area (see Figure 4-1). The depth of fill in the various phases will range from approximately 20 to 150 feet.

FIGURE 4-1 – BLUFF ROAD LINER AND CAPPING SEQUENCE



Approximately 25 acres of the landfill have reached capacity and have been capped; another 15 acres are projected to be capped concurrently with the liner construction in 2006. The closure sequence (see Figure 4-1 and Table 4-4) will consist of the remaining Phases 3 through 12, ranging from 10 to 20 acres and averaging approximately 14 acres. The closure phases are scheduled to occur in the same years as the liner phases. The construction activities that are planned in concert with the cell construction and the cell filling sequence for each phase are shown in Table 4-4.



**TABLE 4-4 – BLUFF ROAD PHASE CONSTRUCTION ACTIVITIES**

Phase No.	Phase Specific Activities	Filling Sequence
10	<ul style="list-style-type: none"> <li>Construct access roads.</li> <li>Install groundwater control system prior to liner construction.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses north to south and east to west.</li> </ul>
11	<ul style="list-style-type: none"> <li>Relocate the storm water detention pond to the south prior to excavation.</li> <li>Construct access roads.</li> <li>Install groundwater control system prior to liner construction.</li> <li>Connect phase leachate collection system to leachate header pipe.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses north to south and west to east.</li> </ul>
12	<ul style="list-style-type: none"> <li>Determine need for groundwater control system.</li> <li>Construct access roads.</li> <li>Construct the new leachate collection header pipe and manholes to connect to the leachate pump station.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses south to north.</li> </ul>
13	<ul style="list-style-type: none"> <li>Determine need for groundwater control system.</li> <li>Construct access roads.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses north to south and west to east.</li> </ul>
14	<ul style="list-style-type: none"> <li>Determine need for groundwater control system.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses west to east.</li> </ul>
15	<ul style="list-style-type: none"> <li>Determine need for groundwater control system.</li> <li>Connect phase leachate collection system to leachate header pipe.</li> </ul>	<ul style="list-style-type: none"> <li>Fill progresses toward adjacent fill areas,</li> </ul>

**North 48<sup>th</sup> Street Landfill**

The North 48<sup>th</sup> Street Landfill (previously known as Landfill East and Landfill West), located at 5101 North 48<sup>th</sup> Street, began accepting solid waste in 1956 and continued operating through 1988, when the Bluff Road Landfill opened. A portion of the closed landfill site is used as a permitted C&D landfill. The closed landfill requires ongoing maintenance and environmental reporting efforts. The site has several groundwater monitoring wells for monitoring static water levels and gas monitoring probes for monitoring gas migration.

Facilities on site include the scale house and truck scale, small vehicle transfer station, recycling drop-off area and yard waste drop-off area, wood grinding area, appliance de-manufacturing facility, maintenance building, and storage building. The transfer station provides disposal and recycling services for residents who choose to self-haul their wastes and recyclables in small vehicles. An old maintenance building located on the south side of the C&D landfill, now used as a storage building, will eventually be demolished when filling progresses to this area. C&D waste will be placed in the areas of the demolished maintenance building.

The current capacity of the North 48<sup>th</sup> Street C&D site is estimated to last until 2021. The site receives an annual tonnage of approximately 88,000 tons per year, with an annual growth rate of C&D wastes of 1 percent. The site had an initial volume of 2,123,200 CY; based on a 2002 aerial survey, the remaining volume, excluding final cover soil is 1,247,400 CY. The remaining estimated capacity and filling sequence are shown in Table 4-5 and Figure 4-2. The capping



## Solid Waste Facilities Plan

sequence and approximate fill acres (see Table 4-6 and Figure 4-3) are based on the estimated quantity of C&D waste received and the location and depth of placement.

**TABLE 4-5 – NORTH 48<sup>TH</sup> STREET C&D LANDFILL CAPACITY PROJECTIONS**

FY	C/D Waste Disposal Tons	CY	Landfill Volume (CY)	Density (lb/CY)	
Initial			2,030,000	2,600	
Mar 94-Jul 94	215,862	166,050	1,863,950	2,600	Historical Data
1994-1995	167,405	128,770	1,735,180	2,600	
1995-1996	112,379	86,450	1,648,730	2,600	
1996/1997	92,868	71,440	1,577,290	2,600	
1997/1998	88,341	67,950	1,509,340	2,600	
1998/1999	101,682	63,870	1,445,470	3,184	
1999/2000	86,760	54,500	1,390,970	3,184	
2000-2001	61,305	38,510	1,352,460	3,184	
2001-2002	88,227	55,420	1,263,800	3,184	
2002-2003	85,300	60,930	1,202,870	2,800	
2003-2004	86,150	61,540	1,141,330	2,800	
2004-2005	87,010	62,150	1,079,180	2,800	
2005-2006	87,880	62,770	1,016,410	2,800	
2009/2010	91,460	65,330	758,960	2,800	Projected
2010-2011	92,370	65,980	692,980	2,800	
2015-2016	97,070	69,340	353,080	2,800	
2019-2020	101,010	72,150	68,730	2,800	
2020-2021	102,020	72,870	-4,140	2,800	

**FIGURE 4-2 – NORTH 48<sup>TH</sup> STREET C&D LANDFILL FILLING SEQUENCE**

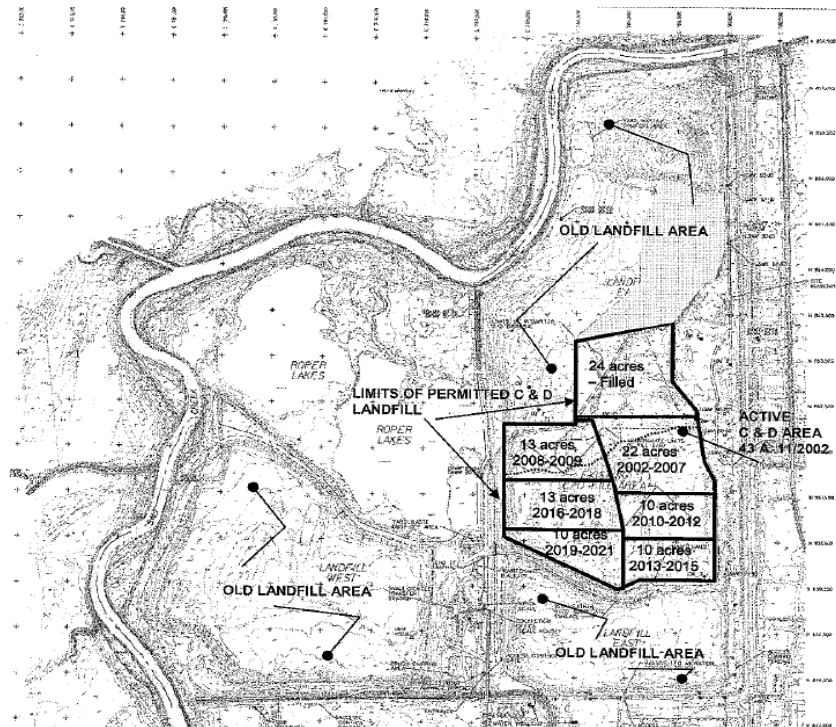
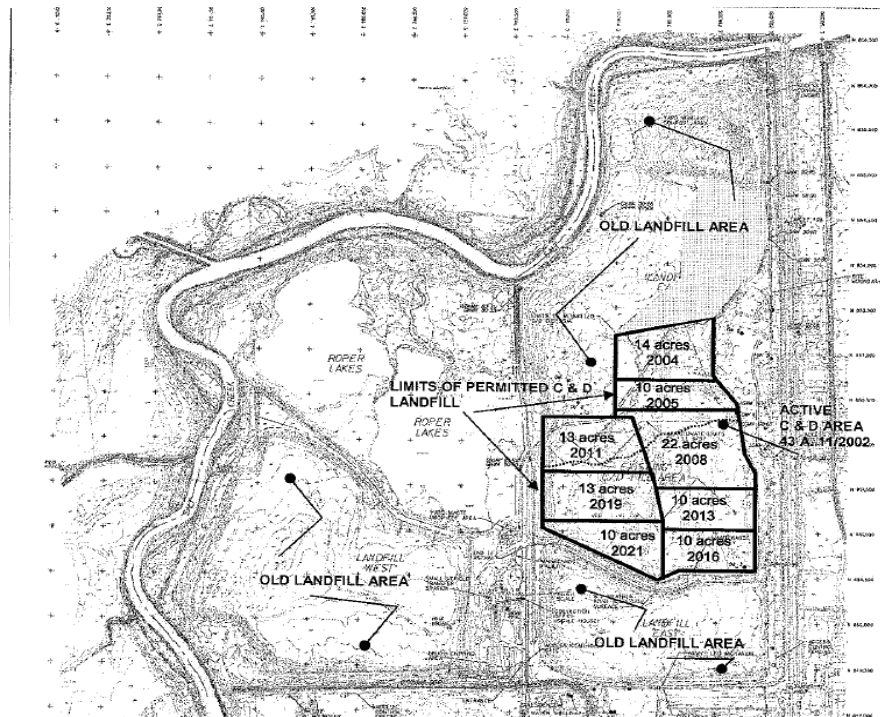


TABLE 4-6 – NORTH 48<sup>TH</sup> STREET C&D LANDFILL PLANNED CAPPING SEQUENCE

FY (ending)	Added Acres	Acres Closed	Acres Requiring Final Cover
2002	0	0	43
2003	3	0	46
2004	1.5	0	47.5
2005	4.5	26	26
2006	3	0	29
2007	0	0	29
2008	3	14	18
2009	6	0	24
2010	6	0	30
2011	3	14	19
2012	0	0	19
2013	6	10	15
2014	3	0	18
2015	0	0	18
2016	3	10	11
2017	7	0	18
2018	0	0	18
2019	7	12	13
2020	3	0	16
2021	0	16	0
<b>Total Acres</b>		<b>102</b>	

FIGURE 4-3 – NORTH 48<sup>TH</sup> STREET C&D LANDFILL CLOSURE SEQUENCE





## Solid Waste Facilities Plan

The future sequence of development will proceed generally from east to west and north to south in strips. The C&D landfill does not require a liner, but does require an engineered soil cover. The average area requiring cover is 20 acres every three years, with the largest area left being 30 acres in 2010. Planning for the development of a new C&D landfill site after the current closure date of 2021 will require approximately five years or more. Therefore, a decision as to whether the City will provide a new facility needs to take place prior to 2015.

The North 48<sup>th</sup> Street Transfer Station is designed for small vehicle use. It has averaged approximately 10,000 tons of waste annually over the last 16 years, but the average annual tonnage has declined to 7,871 tons in the last six years. The number of vehicles using the transfer station has dropped over the years as well, decreasing to 27,987 vehicles in FY2004-2005.

### ***Other Disposal Facilities***

#### ***MSW Landfills***

There are 24 permitted landfills in the State, but most of these are small, municipally operated sites that accept only waste from their respective services areas. However, there are two privately owned landfills within 60 miles of the City: one in Milford in Seward County, which is west of Lancaster County, and one in David City in Butler County, which is northwest of Lancaster County. The G&P Development, Inc. Landfill at Milford, Nebraska, approximately 25 miles from Lincoln, currently receives a portion of the solid waste generated in the Service Area.

#### ***Ash Landfills***

Nebraska Public Power District (NPPD) operates a coal-fired power station (Sheldon Station) in Hallam, Nebraska, in the southern part the County. The bottom ash is utilized by McCabe Minerals, which has a plant on site to process the ash for shingle material. NPPD is no longer paid for this ash. Fly ash is placed in a permitted ash disposal landfill on site, used on roads on site, or given to contractors for soil stabilization. In 2005, the power station produced 31,584 tons of bottom ash and 17,375 tons of fly ash. With the current production, the permitted ash disposal landfill will have capacity for approximately 12 to 15 more years.

#### ***Limited Landfills***

There is only one permitted “limited landfill” in the County. It is located on the south side of west “O” Street, a few hundred feet west of SW 27<sup>th</sup> Street. The site, which accepts concrete and brick, has a capacity of 95,000 CY. The permit for the site expires on August 3, 2006. (See the definition of “limited landfill” in the Construction and Demolition section of Chapter 5, Solid Waste Management Regulations.)

## **Existing Solid Waste Disposal Capacity**

### ***Municipal Solid Waste***

The volume and available soil cover quantities at the Bluff Road Landfill were calculated based on the sequence of development figures and a series of cross sections, each defining a final elevation line, an initial ground elevation line, and an initial landfill bottom line. The excavation volume and fill volume were computed using a combination of the average end area and prismatic methods. The remaining soil cover requirements were calculated by using a refuse-to-



daily-cover soil ratio of 5:1 and a final cap thickness of 3 feet. The resulting soil and landfill volumes are summarized in Table 4-7.

The total landfill volume, excluding the final cover layer, liner, leachate collection system, and protective soil layer, is estimated to be approximately 23,600,000 CY. A more detailed analysis of landfill volumes, soil volumes, and site life is included in Table 4-7.

Additional soil may be obtained as follows: 1) by excavating the southern end of the site; 2) by taking soil from other areas on site (e.g., the screening berm along western property boundary); or 3) by excavating from the adjoining City-owned land to the east. Conservative assumptions were used in determining the soil requirements of the site. These assumptions, plus the availability of excess on-site soil and nearby off-site sources, provide an additional factor of safety both during and after landfill construction.

The remaining life of the site was determined based on the remaining volume, projected waste quantities, and average in-place density. The remaining capacity was estimated to be 65 percent as of August 31, 2005, or equivalent to a remaining life of approximately 24 years. The phase site development and closure schedule is provided in Figure 4-1.

**TABLE 4-7 – REMAINING BLUFF ROAD LANDFILL SOIL AND WASTE CAPACITY**

<b>Excavation Required<sup>(2)(7)</sup></b>	
Landfill area to bottom of liner	2,913,000 CY
Borrow from outside cell (on site)	1,685,000 CY
<b>Remaining Excavation</b>	<b>4,599,000 CY</b>
<b>Soil Fills Required<sup>(7)</sup></b>	
Daily and intermediate cover <sup>(5)</sup> and terraces <sup>(1)</sup>	3,310,000 CY
Fill soils to bottom of liner <sup>(1)(2)</sup>	13,000 CY
Clay liner <sup>(1)(2)</sup>	293,000 CY
Protective soil (liner) <sup>(2)</sup>	139,000 CY
Final cover <sup>(3)</sup>	
Infiltration layer <sup>(1)</sup>	460,000 CY
Erosion layer	384,800 CY
<b>Subtotal Soil Fills</b>	<b>4,599,000 CY</b>
Granular (liner drainage layers) <sup>(4)</sup>	61,000 CY
<b>Total Site Waste Volume (CAPACITY)<sup>(6)</sup></b>	<b>19,200,000 CY</b>
<b>Remaining Waste VOLUME (CAPACITY)<sup>(7)</sup></b>	<b>13,516,000 CY</b>

**Notes:**

- 1 Includes 20% above required amount to account for volume loss due to compaction.
- 2 Remaining liner phases are Phases 9 through 15.
- 3 Remaining closure phases are Phases 2 through 11.
- 4 From off-site sources.
- 5 Assumes refuse to soil ratio of 5:1.
- 6 Based on 1995 Permit Application.
- 7 Based on January 14, 2003 site survey.

***Construction and Demolition Wastes***

Based on the proposed phased closure of the C&D landfill at the North 48<sup>th</sup> Street site, the largest area of C&D waste ever requiring final soil cover is anticipated to be approximately 46 acres. Landfilling will consist of lifts of wastes constructed within the 102-acre footprint to the final grades shown on the drawings. The total permitted C&D landfill is 102 acres from the October 1993 fill line. The total fill depths will range from approximately 0 to 25 feet.



The landfill volume and required soil cover quantities were calculated. The calculations are based on the fill area and a series of cross sections, each defining a final elevation line and a base landfill elevation (coinciding with the existing historic landfill completion grades). The fill volume was computed using the average end area method. The total calculated landfill capacity of the permitted C&D landfill is approximately 2,123,200 CY, excluding the final soil cover. Based on the November 2002 topographic survey and the proposed final contours, approximately 1,247,400 CY of C&D waste disposal capacities remained in the permitted C&D landfill, excluding final soil cover.

### ***Factors Affecting Disposal Capacity***

#### ***Waste Generation Fluctuations***

Many factors affect the amount of waste generated by a county. These factors include population, household status, economy, technology improvements, and education and attitudes about recycling.

Population growth has an effect on the amount waste being generated; the greater the number of people, the greater the amount of waste that is generated. Household status is a major contributing factor in the amount of residential waste that is generated.

The more people there are who live in a particular household, the more waste that the household is going to generate, but as the number of people grows in that particular household, the amount of waste per person declines. In other words, more waste is generated when there are more single-person households with the same overall population than when there are fewer total households with more people per household. This is because of material sharing, such as the example sharing newspapers and consumption of the same meal (as apposed to many single different meals), generates less waste.

Economy also plays a key role in waste generation fluctuations. When the economy is doing well, more goods are purchased, which leads to more waste generation.

Another potential for waste fluctuations in the future relates to electronics waste, known as “e-waste,” which includes electronic appliances, products, components, and accessories that have been deemed obsolete and thus are discarded. Some of the consumer factors that impact the quantities of e-waste disposed over the near-term are:

- ❖ The transition from analog to high-definition televisions
- ❖ The portability of cell phone numbers and cell phone upgrades as service contracts expire
- ❖ The average life span of a personal computer, which has decreased from four or five years to a mere two years
- ❖ The expansion of personal digital assistants and other electronic devices

#### ***Landfill In-place Density***

The Bluff Road Landfill in-place density, which includes waste and daily cover, was calculated based on historical waste-to-soil ratios and waste quantities. The average effective in-place density was calculated to be 1,100 lb/CY. During surveying periods, the City calculated in-place density, excluding the soils used for daily and intermediate cover, and found it to range between 1,265 lb/CY and 1,504 lb/CY. For future projects, the average in-place density to be used is 1,360 lb/CY.



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The remaining volume was estimated using electronic digital terrain modeling (DTM). Airspace remaining in the Bluff Road Landfill was obtained by comparing the January 14, 2003, aerial survey with the top of liner and bottom of cap as defined for the 2003 permit application. The total airspace remaining as of January 14, 2003) equaled 16,219,200 CY.

The in-place density of the C&D landfill at the North 48<sup>th</sup> Street site was based on recent City data. The volume filled between the survey conducted on April 10, 1998, and the survey on November 12, 2002 equated to 248,361 CY, and the scale tonnage over the same survey period was 395,444 tons. This yielded an in-place density of 3,184 lb/CY. For any future projects, the assumed in-place density will be 2,800 lb/CY.

### ***Waste Diversion Programs***

The fluctuation in tonnages at drop-off stations is due to a few factors, such as time and seasonal factor; examples are weekend activities, weather, and transitional seasons. Illegal dumping can also have an effect on waste generation. The location of the drop-off site usually plays a key role in the amount of illegal dumping; if the site is in a well-lit location and somewhere near a busy public road, the amount of illegal dumping is generally less than if the location is hidden from the public eye.

Weather can also play a role in the amount of brush wastes that flow into a compost facility. The October snow storm of 1997 caused a record amount of brush waste generation, with 29,235 tons.

### ***Alternative Disposal Facilities***

The G&P Development Landfill, located near Milford, currently receives a portion of the solid waste generated in Service Area. Any changes in the amount of waste that is disposed of at alternative disposal sites will have an impact on the future waste quantities delivered to the City facilities.



## Chapter 5 – Solid Waste Management Regulations

This chapter summarizes the current and anticipated regulations that affect the City’s solid waste management facilities which impact capital expenditures.

### Planning Requirements

The 1992 Nebraska Integrated Solid Waste Management Act required each county or municipality in the State to file a certification of capacity by October 1, 1993, for solid waste generated within each solid waste jurisdiction area as well as for solid waste generated outside of each area and disposed of in facilities within each area. The Act also required that a solid waste management plan to be filed with NDEQ by October 1, 1994, on behalf of each county and municipality. Capacity certification was to be included in the solid waste management plan for each participating solid waste jurisdiction in the planning region.

The Act required each solid waste management plan to do the following:

- ❖ Certify facility and system capacity for solid waste management for the 20 years following October 1, 1994;
- ❖ Incorporate and reflect the waste management hierarchy of the State integrated solid waste management policy which establishes preferred solid waste management approaches in the following descending order of preference: source reduction; recycling, reuse, and vegetative waste composting; land disposal; incineration with energy recovery; and incineration for volume reduction;
- ❖ State the extent to which solid waste generated within the area covered by the plan is or can be recycled;
- ❖ State the expected environmental impact of alternative solid waste disposal methods, including the use of landfills; and
- ❖ State a specific plan and schedule for implementing technically and economically feasible solid waste disposal methods that will result in minimal environmental impact.

The Act also required each plan to provide for a local waste reduction and recycling program. If technically and economically feasible, the volume of materials disposed of in landfills as of July 1, 1994, was to be reduced by 25 percent as of July 1, 1996; by 40 percent as of July 1, 1999; and by 50 percent as of July 1, 2002. These percentages represent significant increases over the waste quantities diverted in 1992, the year serving as the basis for the plan.

Nebraska Revised Statutes Section 13-2032 (3) requires that the solid waste management plans be “updated for compliance with federal and state laws and regulations as required by [NDEQ] and ... at any time to reflect local needs and conditions.”

### Funding Mechanism Restrictions and Key Decisions

The validity of certain MSW funding mechanism measures have been the subject of considerable litigation over the last decade. In particular funding mechanisms under which a local government requires all solid waste generated within its jurisdiction be delivered to a particular system or facility for processing and disposal, the U.S. Supreme Court and other courts have found to violate the constitutional prohibition on state and local regulation of interstate commerce (*C&A Carbone v. Town of Clarkstown, New York*, 511 U.S. 383 (1994) [*Carbone*]). In the *Carbone* case, the U.S. Supreme Court held that a town’s ordinance requiring private haulers who



## Solid Waste Facilities Plan

collected solid waste within the town to deposit the waste at a certain transfer station constituted economic protectionism in favor of the in-state, privately owned disposal site, in violation of the Commerce Clause of the U.S. Constitution. The federal court decisions have focused on the enforceability under the Commerce Clause of waste disposal ordinances that require 1) collection of solid waste by a governmental entity and/or 2) disposal of such solid waste at particular disposal sites designated by the governmental entity.

Other U.S. Courts of Appeals have held that flow control ordinances do not violate the Commerce Clause where 1) the requirement that waste be disposed of at a particular in-state facility includes an exception for waste destined for out-of-state disposal; 2) the governmental entity acts as a market participant, rather than market regulator, in providing collection or disposal services (for example, by contracting for collection service and requiring disposal at a municipally owned site); or 3) the burdens imposed on interstate commerce by the flow control measure are outweighed by the local benefits of the measure, and the reasons for discrimination are unrelated to economic protectionism.

When the City amended the Lincoln Municipal Code 8.32 with Ordinance #18149 regarding the occupation tax rate on waste haulers, Waste Connections of Nebraska, Inc., a Delaware Corporation doing business as Midwest Refuse and Recycling Service, Inc., and Butler County Landfill, Inc., a Nebraska Corporation brought suit in the Nebraska Supreme Court against the City. Among other things, the ordinance eliminated the previous annual occupation tax of \$100 per refuse vehicle; in lieu thereof, it established an occupation tax of \$7 per ton on all refuse collected within corporate limits of the City or any refuse deposited at the City's public municipal solid waste landfill. Prior to the implementation of the occupation tax, the fees collected for the disposal of solid wastes at the Bluff Road Landfill were used to fund, in part, programs and facility operations other than the Bluff Road Landfill. The deportation of waste outside the City (away from the Bluff Road Landfill) negatively affected the revenues collected and used to fund those other programs and facility operations.

However, in their conclusion the Nebraska Supreme Court rejected the flow control argument and affirmed the City's authority to impose an occupation tax as set forth in City Council Ordinance #18149 and City Council Resolution #A-82000. Ordinance #18149 amended Lincoln Municipal Code 8.32.

### **Permitting Requirements**

Solid waste facilities are required to be permitted in accordance with NDEQ Title 132. Permitting includes both local and state required permits. These can include:

- ❖ Conditional use permit
- ❖ Local siting approval
- ❖ Solid waste facility permit
- ❖ NPDES permit
- ❖ Title V permit

Typically, siting and permitting a solid waste disposal area can take 5 to 7 years depending upon the local climate for the site selection.

### ***Solid Waste Disposal Facilities***

Under RCRA, the U.S. Environmental Protection Agency has promulgated regulations regarding solid waste disposal which are set forth in 40 CFR 257 and 258, Subtitle D. These regulations



## Solid Waste Facilities Plan

generally require that landfills be developed and operated to minimize liquids entering the landfill during construction and operation, and following closure. The State has established regulations for solid waste disposal facilities which incorporate the federal solid waste disposal regulations into NDEQ Title 132, Integrated Solid Waste Management Regulations. These regulations applicable to the planning and development of various solid waste facilities are further discussed below.

Subtitle D was amended on March 22, 2004, when the final rule of the Research, Development, and Demonstration Permits for Municipal Solid Waste Landfills (40 CFR 258.4, amendment to Subpart A) was published in the *Federal Register*. This rule became effective on April 21, 2004. It allows owners and operators of MSW landfills to obtain a research, development, and demonstration (RD&D) permit in approved states for particular research, development, and demonstrations of new methods to manage solid waste disposal in MSW landfills. This research has been principally directed at accelerating bio-degradation of waste through the introduction of liquids (i.e., bioreactor landfills).

RD&D permits provide a variance from existing landfill requirements for surface water run-on control systems, liquids restrictions, and final cover requirements. The variances to run-on control and liquids restrictions relate to leachate recirculation over alternative liners and bioreactor operations.

### ***Land Disposal Bans***

The Act, Neb. Rev. Stat. §13-2039, identifies specific wastes that are banned from landfills or land disposal in general. The current banned items include:

- ❖ Waste oil
- ❖ Scrap tires
- ❖ Lead-acid batteries
- ❖ Yard waste – from April 1 through November 30, unless the landfill has an active gas collection system
- ❖ Discarded household appliances – including clothes washers and dryers, water heaters, heat pumps, air conditioners, dehumidifiers, refrigerators, freezers, trash compactors, dishwashers, conventional ovens, ranges, stoves, and wood stoves
- ❖ Unregulated hazardous waste – hazardous waste that is generated by a conditionally exempt small-quantity generator and contains free liquids or is in solid form in a quantity greater in size or volume than 5 gallons or in a quantity greater in weight than 19.5 kilograms (43 lb), provided that these quantity limits are daily maximum values

The unregulated hazardous waste exclusion does not apply to household hazardous waste.

At each of the City-operated facility locations, separate collection areas are provided for items that are banned from land disposal. Those collection areas accept scrap tires, waste appliances and scrap metals, used oils, and discarded lead-acid batteries.

### ***National Pollutant Discharge Elimination System Permits***

All permitted solid waste disposal and processing facilities are not to cause a discharge of pollutants into waters of the state, including wetlands, that violate any requirements of NDEQ Title 119, Rules and Regulations Pertaining to the Issuance of Permits Under the NPDES. Management of run-on and run-off at these facilities is regulated under the NPDES permit for each site.



On December 1, 2005, USEPA proposed modifications to the NPDES Storm Water Multi-Sector General Permit for Industrial Activities. Subsection L – Sector L applies to “Landfills, Land Application Sites, and Open Dumps” which will apply to the Bluff Road Landfill if promulgated. In 2006, the City and HDR determined, in consultation with the NDEQ, that the storm water runoff being managed at the Bluff Road Landfill is officially classified as “non-contaminated stormwater” in the proposed Subsection L and could be managed through the use of a properly designed sediment pond. Proposed Subsection L identifies parameters to monitor on discharges. Table 5-1 lists only those parameters that may apply to the Bluff Road Landfill “non-contaminated stormwater”; the effluent limitations of the other parameters apply to contaminated stormwater discharges.

**TABLE 5-1 – PROPOSED 2006 MSGP**

Sub-sector	Parameter	Benchmark Monitoring Concentration <sup>(1)</sup>
All Landfill, Land Application Sites and Open Dumps (Industrial Activity Code “LF”)	Total Suspended Solids (TSS)	100 mg/L
All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60 (Industrial Activity Code “LF”)	Total Recoverable Iron	1.0 mg/ L

**Notes:**

<sup>1</sup> Must monitor quarterly in the first year of coverage for each benchmark parameter (see Part 3.2.2.1). For each parameter, no additional benchmark monitoring is required if the average of the 4 monitoring values does not exceed the benchmark (see Part 3.2.2.3). However, for each parameter there are additional requirements if the average of the four monitoring values exceeds the benchmark (see Part 3.2.2.4).

The Bluff Road Landfill currently has a NPDES Permit for storm water discharges from industrial sites. The NDEQ issued to the city an NPDES authorization to discharge on August 16, 1993. The NPDES Permit does not have discharge limitations but does require a Storm Water Pollution Prevention Plan (SWPPP).

***Air Permits – Clean Air Act***

Air quality at an MSW landfill must meet the requirements in 40 CFR 63, Subpart AAAA, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills, and in 40 CFR 60, Subpart Cc, Emission Guidelines (EG), or Subpart WWW, New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills. Subpart Cc applies to landfills constructed before May 30, 1991, and Subpart WWW applies to landfills constructed after that date. Effective January 16, 2003, Subpart AAAA fulfills the requirements of section 112(d) of the CAA, which requires regulation of emissions of hazardous air pollutants (HAP) listed in section 112(b), and helps implement the Urban Air Toxics Strategy developed under section 112(k) of the CAA. Besides establishing NESHAP for MSW landfills, Subpart AAAA requires all landfills defined by Section 63.1935 (such as bioreactor operations) to meet the EG/NSPS requirements of 40 CFR 60, Subpart Cc or Subpart WWW.

Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million mega grams (Mg), or 2.5 million cubic meters, shall either comply with 40 CFR 60.752 (b)(2) or calculate a non-methane organic compound (NMOC) emission rate for the landfill using



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the procedures specified in 60.754 (Tier 2). If the calculated NMOC emission rate is equal to or greater than 50 Mg per year, then an active landfill gas collection and control system will be installed pursuant to 60.752 (b)(2)(ii). Any installed collection system needs to be operated to meet 40 CFR Part 60, Subpart WWWW regulations.

The Bluff Road Landfill has a design capacity greater than 2.5 million Mg and has been operating under the Tier 2 guidelines since 1997. Tier 2 requires the source to determine a site-specific NMOC concentration to be used in place of the default value of Tier 1. The site-specific NMOC concentration is determined as specified in 40 CFR 60.754(a)(3) and used in determining a mass emission rate. The Tier 2 NMOC Emission Rate Reports submitted for the years 1996 and 2001 showed that the Bluff Road Landfill is not expected to exceed the 50 Mg emission rate at any time during its active life. As long as the facility is operating under Tier 2 or Tier 3, the site-specific NMOC concentration at the facility will be retested every five years.

The City will submit an NMOC Emission Rate Report every five years during its active life as long as the estimated emissions are less than 50 Mg per year.

### ***Title V Permit.***

The Bluff Road Landfill and the 48<sup>th</sup> Street C & D Landfill have Title V air permits. These permits require renewal every 5 years and require the City to pay annual emission fees.

## **MSW Disposal Facility Regulatory Criteria**

The regulatory criteria for solid waste disposal facilities, as defined in NDEQ Title 132, Chapter 3, Criteria for Municipal Solid Waste Disposal Areas, De-listed Waste Disposal Areas, Industrial Waste Disposal, Areas and Land Application Units for Repeated Disposal or Treatment of Special Wastes, include:

- ❖ Locational siting criteria
- ❖ Design criteria
- ❖ Operational criteria
- ❖ Closure criteria
- ❖ Post-closure criteria

These regulatory requirements are further defined in the permit conditions contained in the facility operating permit, which must be renewed every five years.

The City was issued a renewed MSW disposal area permit (Permit No. NE0120995, Facility ID No. 58617) for the Bluff Road Landfill on September 29, 2003. The Bluff Road Landfill permit is effective until September 28, 2008 (see Appendix A for a copy of the permit).

In addition, NDEQ has issued the City an administrative extension to its NPDES permit for stormwater discharges from industrial sites for the Bluff Road Landfill. In compliance with the NPDES permit, the City has prepared a Storm Water Pollution Prevention Plan, which identifies plans to control run-off from the active portion of the solid waste disposal area as well as other potential discharges from the site.

### ***Siting Criteria***

Although the siting criteria are not a major issue for the existing solid waste facilities, these criteria will impact the capital costs for new facility planning and development. The siting restrictions in the following areas will apply in the siting of a new MSW disposal area:



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- ❖ Distance from highways (greater than 1,000 feet unless screened)
- ❖ Airport proximity (greater than 10,000/5,000 feet required for turbo aircraft and piston aircraft, respectively)
  - Construction of a new MSW landfill within 6 miles of an airport can be restricted. (Federal Aviation Agency [FAA] Advisory Circular (AC) 150/5200-34 contains guidance on complying with federal statutory requirements at 49 United States Code (USC) § 44718(d), as amended, regarding construction or establishment of landfills near public airports.)
- ❖ Floodplains – shall not be located within a 100-year floodplain.
- ❖ Wetlands – shall not be located in wetlands.
- ❖ Fault areas – shall not be located within 200 feet of a fault unless demonstrated to be structurally sound and protective of human health and the environment.
- ❖ Seismic impact zones – shall not be located in a seismic impact zone unless designed to resist the maximum horizontal acceleration at the site
- ❖ Unstable areas – shall demonstrate engineering measures to ensure the integrity of the containment systems.
- ❖ Threatened and endangered species – refer to Title 163, Chapter 4 Wildlife.

In addition to the siting restrictions, further site information must be obtained to evaluate whether the landfill activities will have a detrimental effect on the waters of the State. Site soils analysis and hydrogeologic investigations are required in order to determine the following criteria:

- ❖ Current and Projected Use of Water/Groundwater Condition
  - Potential zone of influence
  - Water well usage
  - Surface water usage
- ❖ Separation to groundwater – The distance to the maximum water table from the lowest waste point in the disposal area must be a minimum of 5 feet. (The safe vertical distance can be maintained through engineering measures.)
- ❖ Interrelationships of groundwater and surface waters
- ❖ Water quality
- ❖ Soil and bedrock
- ❖ Potential for leachate generation and pollution to waters of the State

In addition, NDEQ Title 132, Chapter 3 requires information regarding the nearest surface water, surrounding land use, and population density.

### ***Design Criteria***

The design of a solid waste disposal facility must be protective of human health and the environment and not result in pollution of waters of the State (NDEQ Title 132, Chapter 3). In the case of a new solid waste disposal area or a lateral expansion of an existing solid waste disposal area, these regulations establish requirements that will affect capital cost planning for landfill expansions and new facility development in the following areas:

- ❖ Landfill design and construction costs
- ❖ Hydrogeologic investigations
- ❖ Construction monitoring
- ❖ Perimeter groundwater monitoring well installation
- ❖ Leachate collection and treatment system
- ❖ Surface water drainage control structures



- ❖ Landfill gas migration control and monitoring wells

***Liner Design***

The construction and design plans for new or lateral expanding waste disposal areas shall include a liner system unless it is exempt by having land application units for repeated disposal or treatment of special wastes. A liner is to be designed and constructed according to one of the following designs:

- ❖ With a composite liner consisting of two components: the upper component must consist of a minimum 30-mil flexible membrane liner (FML); and the lower component must consist of at least a 2-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  centimeters (cm) per second. FML components consisting of high density polyethylene (HDPE) shall be at least 60-mil thick. The FML must be installed in direct and uniform contact with the compacted soil component; or
- ❖ Alternative designs may be approved by NDEQ if it ensures that concentration values, listed in Appendix III of Title 132, will not be exceeded in the uppermost aquifer at a point specified by NDEQ. NDEQ shall consider all of the following factors when approving the design of alternative liner systems:
  - The hydrogeologic characteristics of the facility and the surrounding land
  - The climatic characteristics of the area
  - The volume and type of waste to be deposited
  - The volume and physical and chemical characteristics of the leachate

All required compacted soil components shall be constructed in lifts that do not exceed 6 inches in thickness. Appropriate equipment shall ensure that the lifts receive uniform compaction. The liner shall be supported by material with appropriate bearing strength to prevent failure of any component. This bearing strength shall be documented through materials testing.

***Hydrogeologic Characterization***

New or laterally expanded solid waste disposal area construction and design plans shall include hydrogeologic characterization, including the sequence of earth materials, soils data, and plugging of exploration holes (if exploration holes are drilled to obtain data), as follows:

- ❖ Sequence of earth materials – a description of the sequence of earth materials to a depth sufficient to ensure the reliability of the facility design.
- ❖ Soils data – data obtained from soil samples taken from the proposed facility site which describe the soil classification, grain size distribution, permeability, compatibility, and ion-exchange properties of the subsurface materials for those strata that are essential to the design of the facility
- ❖ Plugging of exploration holes – information showing the manner of plugging and sealing such holes

***Construction Quality Assurance Schedule and Plan***

A construction quality assurance (CQA) plan for engineered containment systems and leachate collection systems is required for permit approval. The CQA plan is required to ensure adequate construction and testing of the containment system components as called for in the design specifications in the facility plan. The CQA plan shall be prepared and signed by a professional engineer registered in the State.



### ***Groundwater Protection and Monitoring***

Groundwater monitoring, using an approved perimeter monitoring well system, applies to all solid waste disposal areas accepting MSW, industrial waste, de-listed waste (that is, hazardous waste that has been de-listed pursuant to the procedures outlined in Title 128, Nebraska Hazardous Waste Regulations), and fossil fuel combustion ash. Groundwater monitoring requirements of NDEQ Title 132, Chapter 7, Sections 002 to 005, may be suspended if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents from that disposal area to the uppermost aquifer during the active life of the facility and the post-closure period.

In the case of a land application unit for repeated disposal or treatment of special waste, the construction and design plans, in addition to Sections 003.01 to 003.03, shall include the following:

- ❖ Measures taken to protect the groundwater
- ❖ A description of the system for collection, containment, treatment, and/or use of all waters within the site confines, which shall include:
  - A monitoring program for surface run-off from the site, developed and implemented to determine the need and extent of containment facilities; or
  - A containment facility designed to contain all site run-off from a 24-hour 25-year storm

The owner or operator shall install a groundwater monitoring system consisting of a sufficient amount of wells at an appropriate depth and location to take water samples from the uppermost aquifer. These water samples will be used to determine if the background water quality has been affected by leakage from an existing solid waste disposal area.

A multi-unit monitoring system (rather than separate groundwater monitoring systems for each landfill unit) may be approved when the facility has several units, provided that the multi-unit groundwater monitoring system:

- ❖ Meets the requirements of NDEQ Title 132, Chapter 7, Ground Water Monitoring and Remedial Action; and
- ❖ Will be as protective of human health and the environment as individual groundwater monitoring systems for each solid waste disposal area, based on the following factors:
  - Number, spacing, and orientation of the solid waste disposal area units
  - Hydrogeologic setting
  - Site history
  - Engineering design of the solid waste disposal area
  - Type of waste accepted at the solid waste disposal area

If groundwater contamination is discovered through a required groundwater sampling program, then remediation and corrective action may be required.

### ***Leachate Collection and Treatment***

A leachate collection and treatment system shall be constructed where necessary to protect the waters of the State. Any required discharge permit shall be obtained from NDEQ. The leachate collection system shall be maintained as required by the post-closure criteria.

Leachate collection systems shall be designed and constructed to maintain less than a 30-cm depth of leachate over the liner.



***Stormwater Run-on and Run-off***

Solid waste disposal area surface water drainage control systems for run-on and run-off shall be designed, constructed, and maintained to meet the following criteria:

- ❖ A run-on control system shall prevent flow onto the active portion of the landfill during the peak discharge from a 24 hour, 25-year storm.
- ❖ A run-off control system from the active portion of the landfill shall collect and control, at least, the water volume resulting from a 24-hour, 25-year storm.
- ❖ Surface water courses and run-off shall be diverted from the solid waste disposal area by devices and means such as trenches, conduits, and proper grading to minimize infiltration and erosion of cover material. The solid waste disposal area shall be constructed and graded to promote rapid surface water run-off without excessive erosion.
- ❖ Run-off from the active portion of the solid waste disposal area shall be handled in accordance with Section 004.08.
- ❖ Re-grading shall be done as required during construction and after completion to avoid ponding of precipitation and to maintain cover material integrity. On-site drainage structures and channels shall be designed for at least a 24-hour, 25-year storm.

***Gas Control and Monitoring***

The construction plans of a MSW disposal area shall include the location and design of the gas control and monitoring system and shall include vents, barriers, or other migration control measures. Passive gas control and migration monitoring generally consists of the following design guidelines:

- ❖ Passive vents installed at approximately 1 per acre, when an area receives final cover.
- ❖ Permanent gas monitoring probes installed along the perimeter property boundary or between the disposal area and property boundary approximately every 1,000 feet. Probes can be installed as the landfill phases are developed. Vertical depth of probes should extend to the shallower of:
  - Water table encountered;
  - Bottom of the first sand or gravel lenses encountered; or
  - Equivalent elevation of the bottom of the landfill.

Gas migration issues could require additional gas monitoring probes, migration barriers, and/or active gas collection system.

***Operational Criteria***

Operations of all solid waste disposal areas shall be in accordance with the approved operating plan and requirements of NDEQ Title 132, Chapter 2, Permits: Application Procedures: Hearings Required. A solid waste disposal area shall be designed and operated at all times so as to not constitute a hazard, or a threat to human health or the environment. The operational criteria shall establish the operating requirements for the following areas:

- ❖ Compliance with an approved operating plan
- ❖ Allowable cover materials
- ❖ Hazardous waste exclusions
- ❖ Site access
- ❖ Stormwater run-on and run-off requirements
- ❖ Landfill gas control
- ❖ Monitoring and reporting requirements



- ❖ Effective noise control
- ❖ Odor control programs

***Operating Plan***

The operating plan for a solid waste disposal area shall include a description of the methods of operations that comply with the requirements of Section 004.01 to 004.17. The operating plan shall also include all of the following:

- ❖ A description of the days and hours of operations
- ❖ A description of the number and duties of employees
- ❖ A listing of sources and types of waste to be received; and an estimate of daily quantity of wastes to be received; the origin of wastes to be received; and load inspection techniques
- ❖ Numbers, type, and size of equipment on site as well as provisions for obtaining backup equipment, if necessary
- ❖ A contingency plan for addressing reasonably foreseeable events, including, but not limited to, wet weather, high winds, frozen conditions, fires, or natural disaster
- ❖ A schedule of filling; methods and compaction of wastes; and a phased site development plan
- ❖ The types and sources of daily, intermediate, and final cover to be used

***Landfill Gas Requirements***

An owner or operator of an MSW disposal area shall ensure that:

- ❖ The concentration of methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and
- ❖ The concentration of methane gas does not exceed the lower explosive limit for methane at the solid waste disposal area property boundary.

Owners or operators of an MSW disposal area shall implement a routine methane monitoring program to ensure that the standards of Section 004.17C1 are met. The monitoring program shall be included in the facility operating plan.

The type and frequency of monitoring shall be determined by the following factors:

- ❖ Soil conditions
- ❖ Hydrogeologic conditions surrounding the facility
- ❖ Hydraulic conditions surrounding the facility
- ❖ Location of facility structures and property boundaries

The minimum frequency of monitoring shall be quarterly. If methane gas levels exceeding the limits specified in 004.17C1 of NDEQ Title 132, Chapter 2 are detected, an owner or operator shall:

- ❖ Immediately take all necessary steps to ensure protection of human health.
- ❖ Immediately notify NDEQ.
- ❖ Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health.
- ❖ Within 60 days of detection, implement a remediation plan for the methane gas releases which describes the nature and extent of the problem and the proposed remedy. Any proposed remedy must protect human health and the environment. A copy of the plan



shall be placed in the operating record. The owner or operator shall notify NDEQ that the plan has been implemented.

In addition, owners and operators must comply with the air emissions regulations under the Federal Clean Air Act applicable to landfill gas (40 CFR Part 60) which have been incorporated in NDEQ Title 129 Air Quality regulations, as described above. Based on the latest gas sampling conducted on the Bluff Road Landfill in November and December 2001, the Bluff Road Landfill is not required to install an active gas collection system to meet these regulations. However, the landfill is required to verify these results by gas sampling every five years (Tier 2 testing) as long as the landfill continues to receive waste deliveries.

### ***Closure Criteria***

The regulatory final cover system shall include an infiltration layer of a minimum of 18 inches of soil material with a permeability less than or equal to the permeability of the bottom liner system or  $1 \times 10^{-5}$  cm per second, whichever is less; and an erosion layer of a minimum of 18 inches of soil material capable of sustaining adequate vegetative cover. An alternative final cover design may be proposed to NDEQ provided that it achieves equivalent reduction in infiltration and protection from erosion as the prescribed final cover system.

### ***Post-Closure Criteria***

After completion of closure, owners or operators of solid waste disposal areas must provide post-closure care for a period of 30 years. Post-closure care includes annual inspection, maintenance and monitoring activities required to maintain the integrity of the final cover, site, and monitoring systems. The frequency of these activities should be adjusted based on the presence or absence of any detected emissions, the post-closure stability of the waste and cover system, and the integrity of on-site support systems.

## **Fossil Fuel Combustion Ash**

Fossil fuel combustion ash is defined by NDEQ Title 132 as “fly ash, bottom ash, slag, and flue gas emission control ash generated from utility plants or other facilities in which coal is the primary fuel source.” Many utilities recover fly ash and bottom ash as beneficial fill in accordance with requirements in NDEQ Title 132, Chapter 4 and the guidance document “Beneficial Use of Coal Combustion By-Products.” However, some portion of ash generated annually is landfilled.

Fossil fuel combustion ash disposal areas have similar regulatory requirements as MSW disposal areas, with the following differences:

- ❖ Locational criteria – Restrictions related to airport proximity, fault areas, and seismic impact zones do not apply.
- ❖ Design criteria – No landfill gas control and monitoring are required
- ❖ Operational Criteria
  - Placement method and liquid restriction criteria apply (certain exceptions apply)
  - Cover material is not required.
  - Control programs for noise, odor, litter, and disease vectors are not required.
  - Only procedures for excluding unacceptable waste are required (waste type limitations provide for hazardous waste exclusion).



- ❖ Closure plan criteria – The final cover system shall be 2 feet of soil capable of sustaining vegetation.
- ❖ Post-closure plan criteria – The post-closure period is five years.

The current fossil fuel combustion ash disposal areas in the Service Area are owned and operated by NPPD. However, once the existing facility at Hallam reaches capacity, NPPD may require disposal capacity for the ash residue on a temporary basis if there are any delays in siting and constructing a new ash disposal facility.

### Construction and Demolition

C&D waste can be disposed of in either an MSW disposal area or a dedicated C&D waste disposal area. C&D waste disposal areas are regulated under NDEQ Title 132, Chapter 5, Criteria for Construction and Demolition Waste Disposal Areas.

#### *Definitions*

C&D waste is defined by NDEQ Title 132 as “waste which results from land clearing, the demolition of buildings, roads or other structures, including, but not limited to, fill materials, wood (including painted and treated wood), land clearing debris other than yard waste, wall coverings (including wall paper, paneling and tile), drywall, plaster, non-asbestos insulation, roofing shingles and other roof coverings, plumbing fixtures, glass, plastic, carpeting, electrical wiring, pipe and metals. Such waste shall also include the above listed types of waste that result from construction projects.”

The City Municipal Code, Chapter 8.32, defines these sites as “limited landfills.” “Limited landfill” shall mean a type of operation which is approved by the Health Director and in which only building rubbish and demolition debris are disposed of by plan on a specified parcel of land and operated and maintained in such a manner as to present no danger to the health and safety and welfare of human beings.

C&D waste does not include friable asbestos waste, special waste, liquid waste, hazardous waste and waste containing PCBs, putrescible waste, household waste, industrial solid waste, corrugated cardboard, appliances, tires, drums, and fuel tanks.

#### *Regulatory Requirements for C&D Disposal Areas*

A C&D waste disposal area has less stringent regulatory requirements than an MSW, industrial waste, or fossil fuel combustion ash waste disposal area. A site investigation is still required for C&D waste disposal areas in order to determine distance to groundwater and any unstable areas. Some of the differences are as follows:

- ❖ Locational criteria
  - The distance to the maximum water table from the lowest waste point in the disposal area is a minimum of 10 feet.
  - No hydrogeologic characterization is required except as it relates to groundwater elevations and unstable areas.
  - Only information related to nearby surface waters, population density, nearest municipality, land use, 100-year flood plain restriction, and wetlands restrictions is required.
- ❖ Design criteria
  - No liner system is required.



## Solid Waste Facilities Plan

- No leachate collection system is required.
- No groundwater monitoring is required.
- No landfill gas control and monitoring are required.
- The CQA plan applies to only final cover system and any surface water control structures.
- ❖ Operational Criteria
  - The frequency of covering material can be reduced.
  - Control programs for noise and odor are not required
  - Only unacceptable waste exclusion procedures are required (waste type limitations provide for hazardous waste exclusion).
- ❖ Closure plan criteria
  - The final cover system shall consist of 3 feet of soil capable of sustaining vegetation.
- ❖ Post-Closure Plan Criteria
  - The post-closure period is five years.
- ❖ Record-keeping Requirements
  - Record-keeping requirements are reduced due to elimination of monitoring programs.

The primary issues with C&D waste disposal areas have been the exclusion of unacceptable wastes and control of surface water run-on and run-off. Detailed regulatory requirements to permit a C&D waste disposal area are presented in NDEQ Title 132, Chapter 5.

### ***North 48<sup>th</sup> Street C&D Landfill Permit***

The City has been issued a C&D waste disposal area permit (Permit No. NE0203921, Facility ID No. 63332). This permit is renewed every five years. The current permit is effective from September 25, 2003, to September 24, 2008. The City has a variance to the final cover depth to apply 2 feet of soil instead of the regulatory 3 feet. At this site, the City also has a variance to the minimum 10-foot separation to groundwater. The current C&D landfill is located atop a portion of a historic MSW disposal unit, and some areas have less than 10 feet to maximum recorded groundwater elevations. The City is operating the C&D landfill in order to improve the drainage and minimize infiltration into the historic landfill. Furthermore, the C&D landfill accepts only select C&D waste and clean beneficial fill materials in accordance with the NDEQ operating permit. A copy of the permit is located in Appendix B.

The City has an administrative extension from NDEQ to its NPDES permit for storm water discharges from construction sites for the C&D landfill at the North 48<sup>th</sup> Street site.

Processing of C&D waste for recycling and recovery may be regulated under the regulations in NDEQ Title 132, Chapter 6, Solid Waste Processing Facilities. If the C&D recycling and processing meets the definition of a recycling center, then it will be exempt from these regulations.

## **Solid Waste Processing Facilities**

Solid waste processing facilities are defined as any facility where solid wastes are processed, including, but are not limited to, solid waste compost sites, materials recovery facilities, recycling centers, and solid waste transfer stations. Regulations for solid waste processing facilities can be found in NDEQ Title 132, Chapter 6.

Recycling centers or collection sites, such as the City's recycling drop-off sites, are exempt from solid waste permitting requirements pursuant to NDEQ Title 132, Chapter 2.



## Solid Waste Facilities Plan

The City Municipal Code, Chapter 5.41, Salvaging, Recycling and Compost Operations, also places permitting and operating requirements on solid waste processing facilities in order to provide additional locational restriction, protect the public health, and prevent the development of a public nuisance.

### ***Transfer Stations***

Transfer stations are primarily used for transferring solid wastes that are generated remotely from the facility premises from vehicles or containers into other vehicles or containers for transportation to a disposal area or processing facility. A transfer station must meet the permit requirements of NDEQ Title 132, Chapter 6, unless the transfer station receives waste from vehicles other than those vehicles designed to compact solid waste. These operational criteria for transfer stations are:

- ❖ Operations shall not constitute a hazard or a threat to human health or the environment;
- ❖ Effective litter and disease vector control programs shall be implemented.
- ❖ Compliance with applicable air quality standards developed under Title 129, Nebraska Air Quality Regulations, is required.
- ❖ No discharge of surface water run-off to waters of the State that violate an NPDES permit or an area-wide or State-wide water quality management plan approved under the Clean Water Act is permitted.
- ❖ Compliance with storage capacity and designated storage area restrictions is required.

### ***Material Recovery Facilities***

A materials recovery facility (MRF) is any facility at which solid waste is processed for the purpose of resource recovery. A permit is required for all MRFs in accordance with regulations in NDEQ Title 132, Chapter 6. Specific permitting requirements include the following:

- ❖ Locational Criteria
  - Wetlands restriction
- ❖ Construction and design criteria
  - Protection of human health and the environment
  - Protection of waters of the State
- ❖ Operational criteria
  - Operations that do not constitute a hazard or a threat to human health or the environment
  - Implementation of effective litter and disease vector control programs
  - Compliance with applicable air quality standards developed under Title 129, Nebraska Air Quality Regulations
  - No discharge of surface water run-off to waters of the State
  - Compliance with storage capacity and designated storage area restrictions
  - Implementation of procedures for excluding the receipt of hazardous waste or TSCA regulated PCB wastes
  - Control of public access to the site
  - Development of an operating plan describing the methods of operations
- ❖ Closure plan criteria
  - Description of activities required to close the site in a manner protective of human health and the environment
  - Description of post-closure plans for the inactive site
  - Methods or means for notifying facility users of closure;



- Description of location where all materials remaining at the site will be disposed, when applicable
- ❖ Financial assurance requirements
  - No post-closure is required.
- ❖ Recordkeeping requirements

NDEQ Title 132, Chapter 6 provides further descriptions of these criteria and requirements. Recycling centers that receive, collect, and process source-separated recyclable materials for resale or transfer are exempt from the MRF permitting requirements. Processing at a recycling center means the modification of materials by baling, crushing, grinding, chipping, or other means to prepare the materials for markets.

### ***Composting Facilities***

#### ***Definition***

Composting is defined by NDEQ Title 132 as the controlled aerobic, thermophilic, microbial degradation of solid organic material such as raw or treated sewage sludge, animal manure, paunch manure, plant or food residue or their mixtures, to a stabilized, humus-like material.

#### ***Permit Requirements***

A permit is required for a solid waste compost site if it receives any of the following materials:

- ❖ More than 100,000 CY per year of yard waste
- ❖ Material other than yard waste or livestock waste in quantities greater than 1,000 CY per year
- ❖ More than 20,000 CY per year of livestock waste other than that generated by the property owner

Permit requirements for solid waste compost sites are further described in NDEQ Title 132, Chapter 6. The next regulatory level for compost sites is the partial exception compost facility. Such compost facilities receive the following quantities of materials:

- ❖ Yard waste in quantities between 20,000 and 100,000 CY per year
- ❖ Livestock waste, other than that generated by the property owner, in quantities between 1,000 and 20,000 CY per year;
- ❖ Under 1,000 CY per year of material other than yard waste
- ❖ Between 20,000 and 100,000 CY per year of yard waste in combination with under 1,000 CY per year of other materials.

A permit is not required for these facilities, but operations of a partial exception compost facility must comply with the operational criteria in NDEQ Title 132, Chapter 2.

Compost facilities receiving materials less than those identified above are exempt from permit and operating requirements, as long as these exempt facilities are operated in a manner that is protective of human health and the environment.

#### ***Bluff Road Yard Waste Composting Operation***

The City operates a yard waste composting facility at the Bluff Road Landfill site does not require a permit because it receives less than 100,000 cubic yards of grass and leaves annually or more than 1,000 cubic yards of other waste for composting. The City's yard waste composting



facility has developed standard operating procedures that comply with the following operational criteria pursuant to NDEQ Title 132, Chapter 2:

- ❖ Operations that do not constitute a hazard or a threat to human health or the environment
- ❖ Implementation of effective litter and disease vector control programs
- ❖ Compliance with applicable air quality standards developed under Title 129, Nebraska Air Quality Regulations
- ❖ No discharge of pollutants to the waters of the State
- ❖ Compliance with storage capacity and designated storage area restrictions

### Financial Assurance

All permitted solid waste management facilities require a cost estimate for closing the facility and maintaining the facility over the regulatory post-closure care period, except as provided in NDEQ Title 132, Chapter 8, Financial Assurance Criteria: Solid Waste Management Facilities. Owners or operators of solid waste management facilities must demonstrate financial responsibility for closure and/or post-closure care. The concept of financial assurance is to make sure money is available when needed to provide for closure and post-closure care activities. The financial assurance mechanisms allowed by NDEQ Title 132, Chapter 8 include the following:

- ❖ Trust fund
- ❖ Letter of credit
- ❖ Surety bond
- ❖ Local government financial test or guarantee
- ❖ Corporate financial test or guarantee
- ❖ Insurance

Any State-approved mechanism is also allowed. Currently, there are two approved State-approved mechanisms:

- ❖ Escrow account
- ❖ Enterprise fund

The City of Lincoln uses the local government financial test method for financial assurance. The amount the financial assurance mechanism is determined by cost estimates of the closure and post-closure care of facility. For solid waste disposal areas, this is the cost of hiring a third-party to 1) close the largest area of the solid waste disposal area requiring a final cover at any time during the active life; and 2) conduct post-closure care for the solid waste disposal area for the entire post-closure care period specified in the regulations.

### Special Wastes

Special wastes are classified by NDEQ under Title 132, Chapter 13, Special Wastes, on a case-by-case basis. Special waste is non-hazardous waste generated from businesses, industry and government. They generally include any waste that requires special management to ensure protection of the public health, safety, or the environment based on the physical, chemical, or biological properties of the waste. A special waste permit must be issued by the Lincoln-Lancaster County Health Department for special waste to be disposed at the landfill.

Wastes included in this category include but may not be limited by the following:

- ❖ Infectious wastes that require incineration, autoclaving or other treatment methods
- ❖ Sludge containing free liquids
- ❖ Hazardous wastes that have been de-listed under Title 128 procedures



## Chapter 6 – Solid Waste Needs Assessment

In addition to environmental criteria, the economic evaluation of facility development alternatives is an important tool for project development and solid waste management decision making. The economic evaluation methods described in this chapter have been used to help determine the most cost-effective solid waste management program for the City.

### **Solid Waste Comprehensive Plan**

The 2025 Comprehensive Plan presents policies for future growth and helps guide future decisions and development within the community. The solid waste management systems developed by City and evaluated under this study are consistent with the 2025 Comprehensive Plan. It is intended that planning recommendations and costs identified in this Plan be used in future City-wide planning efforts.

### **Current Key City and County Policies**

#### ***Services Provided***

The Service Area for solid waste service is currently restricted to residents and businesses located in Lancaster County. The City's current policy regarding solid waste and recycling curbside collection services is to allow the private sector to continue to provide these services for residential and commercial customers on a market-driven basis. In addition, the City continues to rely on the private sector for the processing and marketing of the recyclable materials collected through the drop-off recycling program.

The City will continue to support the siting of recycling drop-off locations and the servicing of these drop-off sites and to provide MSW landfill disposal capacity for the Service Area. The decision as to whether to continue to provide C&D disposal services after the North 48<sup>th</sup> Street site is closed and whether to modify or construct a new transfer station will need to be addressed in the Solid Waste Management Plan update.

#### ***Design Period and Project Staging***

Two planning periods were used in analyzing the cost of various solid waste facility alternatives. As part of its annual budgeting process, the City prepares a six-year capital improvement budget, which has been incorporated into this document. A 25-year base planning period from 2006 through 2030 was used for providing a long-term planning horizon for solid waste facilities development.

#### ***Economic Evaluation Basis***

##### ***Present Worth Analysis***

Some of the projected costs will be incurred today, and some will be incurred in the future. Therefore, a reasonable adjusting method must be used to reflect the fact that a dollar's purchasing power diminishes over time. For this Plan, present worth analysis has been used to provide meaningful cost comparisons for alternative courses of action. It should be recognized, however, that the economic life assigned to the various solid waste system components is only



estimated to facilitate cost comparison and may not accurately reflect a component’s true useful life. The following sections describe the cost estimating methods used in this Plan.

**Capital Cost Estimates**

Actual projects were used as a basis for much of the cost estimating data for facility capital improvements. Other cost sources include manufacturers, suppliers of material and equipment, local contractors, and project data provided by professional journals and construction publications.

All costs presented in this Plan were derived using the same level of estimating accuracy and are therefore comparable. Actual construction costs may differ from the estimates presented, as a result of specific design requirements and the economic climate at the time a project is bid.

Many of the cell and closure construction cost estimates presented herein are based on unit costs derived from historical construction costs for other projects, adjusted appropriately to reflect project specific conditions. Considerable judgment is required to arrive at unit costs that most closely reflect the future facility needs for the City.

Construction costs of general items are estimated as a percentage of the total cost because the necessary field studies and designs are not yet complete. This allows for a clearer definition of the required work, as described below.

Site work can include such items as clearing and grubbing, excavation, grading, major drainage facilities, roadways, curb and gutter, sidewalks, landscaping, and fencing. A 15 percent factor is applied to the total equipment and construction budget to cover site work expenses.

Construction cost estimates for piping networks for leachate or gas collection systems were developed based on pipeline size, general landfill configuration, and historical cost for similar projects.

**Cost Index.** Cost estimates were obtained from projects in different locations and in different years. To bring all costs to a common, comparable base, the *Engineering News-Record* (ENR) Construction Cost Index was used. This is a common, industry-accepted means of adjusting costs from different time periods and locations. The ENR Construction Cost Index tracks construction costs in 22 U.S. cities and is computed from construction, material, and labor costs.

**Contingencies.** Feasibility studies, master plans, and financial assurance estimates represent a relatively “rough” level of construction cost estimating. Pre-bid construction cost estimates, which are based on well defined engineering drawings and specifications, represent a much more refined cost estimate. The American Association of Cost Engineers (AACE) has developed levels of accuracy for various stages in construction cost estimation. The AACE cost estimation accuracies are presented in Table 6-1.

**TABLE 6-1 - CONSTRUCTION COST ESTIMATION**

Type of Estimate	Anticipated Range of Accuracy		
Order of magnitude estimate (facilities plan)	50%	to	-30%
Budget estimate	30%	to	-15%
Definitive estimate	15%	to	-5%

The AACE accuracy levels confirm that the fewer the unknowns and the closer to construction date, the more accurate the cost estimate becomes.



## Solid Waste Facilities Plan

To adjust for the level of uncertainty associated with a particular project, contingency funds are commonly included. As a project becomes better defined, there are fewer unknowns and the magnitude of the contingency allocation decreases. In general, facility planning reports include contingencies of 20 to 30 percent of the total equipment and construction costs, whereas a design development document may include a contingency of only 10 to 20 percent.

Actual facility configurations are likely to vary from preliminary planning documents. Therefore, physical land characteristics such as slope, groundwater depth, geotechnical characteristics, and utility conflicts are unknown and cannot be included in the current cost estimates. Such uncertainties are accounted for in the contingency allocation. Considering the level of unknowns associated with the projects identified in this Plan, a contingency factor of 25 percent has been included in the construction costs presented in this document.

**Legal, Engineering, and Administration Costs.** A contingency factor of 25 percent has been used to account for engineering, legal, and administrative costs for projects described in this Plan. These costs are related to the following services:

- ❖ Legal services are frequently required to coordinate construction efforts with local government agencies as well as to facilitate land purchases and easement and right-of-way transactions. (Fees for these potential legal services were not included in the construction cost estimates.)
- ❖ Similarly, ancillary engineering services such as special investigations, surveys, foundation reports, determinations of the location of interfering utilities, detailed design, preparation of plans and specifications, construction inspection and materials testing, start-up assistance, and operations and maintenance manual preparation may be required. (These potential ancillary engineering services were not included in the construction cost estimates.)
- ❖ Finally, administrative efforts are also required to coordinate the engineering and legal efforts of all projects.

## Anticipated Solid Waste Management System Needs

### *Land Requirements*

The City owns the land required for expansion of MSW landfill disposal facilities to serve the projected 2030 needs. However, the land requirements for the C&D materials and any future transfer station and/or drop-off convenience facilities to serve the projected future needs have not been acquired.

A transfer station facility similar to the one at the North 48<sup>th</sup> Street site would require a minimum of a 5-acre site but could require more land depending on the site-specific circumstances. Due to the difficulty of siting solid waste disposal facilities, however, the City should review its long-term strategy for providing transfer station services and acquire the land necessary for these facilities well in advance of urban development. The planning for these facilities should also be incorporated into the long-term zoning plan for the County.

Drop-off convenience sites for recyclables have historically been sited in parking lot locations at high-traffic centers. Siting at such locations has to be negotiated with the property owner and normally require an area of less than half an acre; they may be as small as two or three parking stalls.



***Waste Diversion Facilities***

***Drop-off Facilities***

The current drop-off facility sites cannot readily be expanded to accept greater material quantities because there is no room for expansion. New drop-off sites will be needed as the City's size and population grow. Ideal locations are in the southeastern portion of the City because the majority of the City's population resides there and this area is expected to continue to grow.

The amount of e-waste sent to the North 48<sup>th</sup> Street Transfer Station has increased over the last year; however, e-waste represents a relatively small percentage of the total waste stream and is not expected to dramatically change overall generation tonnage. Nevertheless, e-waste has been a focus of attention in the solid waste community because of the concentration of heavy metals used in electronics and therefore should be considered in solid waste planning efforts for drop-off facilities.

***Material Processing Capacity***

The 40,000-square-foot material processing facility that processes all of the recyclables collected through the City's recycling drop-off sites as well as recyclables from private businesses appears to have adequate capacity to accommodate the currently projected recyclable materials for the planning period. Therefore, a requirement for additional processing capacity is currently not anticipated unless there are major changes in recycling programs offered in the Service Area.

***Transfer Station Facilities***

The North 48<sup>th</sup> Street Transfer Station throughput has declined over recent years. Therefore, the capacity of this facility should be adequate and not require any expansion during the planning period in order to handle self-hauled (small load) waste customers.

As the City grows, a new transfer station may be required to handle self-haul waste in the southern part of the County. In the future, the City may consider allowing commercial collection vehicles access to the transfer station. These decisions to expand, relocate, or add a transfer station facility will need to be evaluated during the future Solid Waste Plan update. Any facility modification should be based on customer surveys, net revenue analysis and waste management requirements. No site has been identified for a new solid waste transfer station. The implementation effort for the siting and development a new transfer station requires approximately five years. However, the City may want to consider purchasing the land several years before that. Because the population of the City is largely located in and expanding toward the south, a new transfer station located in the southern part of the City or south of the City could be the ideal site.

***Disposal Facility Expansions***

***C&D Disposal***

**North 48<sup>th</sup> Street.** The C&D landfill at the North 48<sup>th</sup> Street site is estimated to be at approximately 50 percent of capacity, with an estimated remaining site life of approximately 17 years. This site does not have capacity for expansion. State and federal laws require the City to close the permitted C&D landfill once capacity is reached and to monitor and maintain the site for five subsequent years.



## Solid Waste Facilities Plan

In addition to the construction of engineered capping and cover systems, monitoring activities at this site must continue during the closure and post-closure periods. These include, but are not limited to, landfill gas, groundwater, and storm water management. Site security must be maintained and access must be controlled. Efforts to establish acceptable vegetation, such as mowing and weed control must also continue. If necessary, remedial action to address environmental concerns may occur during the closure and post-closure periods.

The City will need to decide when the Solid Waste Management Plan is updated, how future C&D disposal capacity needs will be provided.

**Limited Landfill Facilities.** Many construction contractors operate their own C&D salvage operations. Other limited landfill operations for clean construction fill materials are expected to be developed by the private sector.

### ***MSW Disposal***

State and federal laws require the City to close permitted MSW landfills once capacity is reached and to monitor and maintain the site for 30 subsequent years. These closure and post-closure costs are reported as an operating expense in each financial report period based on the landfill capacity used as of each statement of net assets.

The estimated costs of closure and post-closure care are subject to change based on the effects of inflation, revisions to applicable laws, changes in technology, the sequence of landfill development, closure, and other variables.

In addition to constructing engineered capping and cover systems, other monitoring activities that must continue during closure and post-closure periods include, but are not limited to, landfill gas, groundwater, leachate, and stormwater management. Site security must be maintained, and access must be controlled. Efforts to establish acceptable vegetation, such as mowing and weed control must also continue. If necessary, remedial action to address environmental concerns may occur during the closure and post-closure periods.

### ***Ash Disposal Capacity***

The NPPD Sheldon Power Plant Ash Disposal Landfill at Hallam, under current operating conditions, appears to have adequate capacity for approximately 12 to 15 more years. NPPD currently plans to submit a permit application to provide additional ash disposal capacity when it is required. Thus, unless there are any NPPD permitting delays, the Service Area is not currently expected to have a need to handle additional volume at its current or future landfill disposal facilities.

## **Summary of Solid Waste System Needs**

### ***Sanitary Landfill Revenue Fund***

The Sanitary Landfill Revenue Fund is an enterprise fund that is used to account for the operations and activities related to the management of solid wastes generated within the City of Lincoln and Lancaster County. Fund revenues are derived from the following sources:

- ❖ Userfees, periodically authorized by the City Council
- ❖ Occupation tax
- ❖ Material sales



- ❖ Asset disposal sales
- ❖ Grants

The revenues and expenses for the operation of the Bluff Road Landfill are separate from the revenues and expenses for all other solid waste management programs and activities. The accounting for the Capital Improvements Program for the Bluff Road Landfill is also distinct from the Capital Improvements Program for the other solid waste management programs and activities.

### ***User Fee Revenues***

The City Council has established user fees for the Bluff Road Landfill, C & D Landfill, Transfer Station, and Composting Facility.

The Bluff Road facility projects are funded by the Bluff Road Landfill user fees. These projects include; landfill expansions (leachate collection and liner systems as well as storm water detention and drainage), site maintenance and closure, final cover, air quality assessment (Tier 2) and landfill gas control systems, leachate collection and treatment facilities, and site re-permitting.

### ***Occupation Tax***

All refuse haulers operating within the City limits are charged a City occupation tax which is applied to each ton of refuse collected within the corporate City limits regardless of the disposal location used. Waste collected in Lancaster County and hauled elsewhere is not subject to the Occupation Tax, however waste hauled to the Bluff Road landfill is assessed the Occupation Tax.

The North 48<sup>th</sup> Street Landfill and Transfer Station projects are funded by user fees and the Occupational Tax. These projects include closure costs for Landfill East (310 acres) and Landfill West (140 acres), closure costs for the C&D site, air quality assessment (tier 2), and site re-permitting.

Solid waste management systems projects for recycling, compositing, and volume reduction are funded by the occupational tax, user fees and material sales. Projects include solid waste management plan updates, the C&D operations, existing recycling drop-off site maintenance/improvements, expansion of the recycling drop-off program, and existing composting site maintenance and improvements.

### ***Miscellaneous Revenues***

The revenue fund also receives some revenues from the sale of material revenues, the salvage value from equipment or other asset sales, and from time to time grant money for some of the City's solid waste programs. The revenues from these sources are allocated to offset capital and operating costs in their associated programs.

### ***Capital Funding Projects***

The Capitol Improvement Program for 2006 to 2012 was divided into two "project" categories: the first project is for the Bluff Road Landfill and the second is for Other Solid Waste Programs including the North 48<sup>th</sup> Street C & D Landfill, Transfer Station and recycling/composting programs.



***Project 1 – Bluff Road Landfill***

The Bluff Road Landfill capital improvements include all the essential capital expenditures necessary to assure the proper disposal of MSW for the Service Area in a manner that meets NDEQ Title 132 Operating Permit Requirements and Federal regulatory requirements. The capital expenditures are subcategorized as follows:

***Leachate Collection and Liner Facilities***

These projected capital costs are related to the construction of groundwater barrier at the bottom of the landfill and are based on the average of previous construction bids on a cost per acre escalated at 3 percent per year to the proposed construction. The number of acres in each construction phase is determined by surface water drainage patterns and related excavation requirements. The phase timing is determined by the air space volume created above the constructed liner, which might include sloped areas in some previously constructed liners.

***Site Maintenance and Closure***

These projected capital costs are related to the on-going operation regulatory requirements for annual site maintenance and closure activities such as litter fence construction, drainage control, seeding and landscaping for perimeter screening or site aesthetics. These capital costs are based on historical unit costs for such things as infrastructure, buildings, roads, utilities and the disposal operating face movement as the site is filled.

***Leachate Collection and Treatment Facilities***

These projected capital costs are related to the design and construction of additional storage capacity and pretreatment for leachate generated by the landfill. Cost effective methods for managing the leachate have been evaluated and a preliminary plan has been completed. Although it is not currently planned, the City may decide at some future date that it is more economical to connect to the sewage treatment plant, when the sewage piping infrastructure becomes more developed around the landfill.

***Final Cover Construction***

The funding for the construction of the final cover system on top of the landfill is required by regulation. These projected capital costs are based on the average of previous construction bids on a cost per acre escalated at 3 percent per year to the construction. The number of acres in each construction phase is determined by surface water drainage patterns and regulatory requirements.

***Site Re-permitting***

The landfill must be re-permitted every five years. The capital cost for the engineering support in the permitting process is based on the historical costs escalated by 3 percent per year to the year of expenditure.

***Project 2 – Other Solid Waste Management Programs***

All other solid waste management program capital improvements are included under Project 2, including landfill closure at N. 48<sup>th</sup> Street and post closure management of this site, all the recycling and compost programs and the solid waste planning efforts.



### ***N. 48<sup>th</sup> Street Landfills Improvements***

The previous City landfill at N. 48<sup>th</sup> Street requires capital improvements to meet regulatory requirements for the closure and post-closure care in addition to funding commitments to prepare the property for use by the City Parks and Recreation Department.

#### **Closure Costs for Landfill East and Landfill West**

The closure costs include funding for additional cover soil, drainage improvements and re-vegetation of 450 acres relating to the City's old North 48<sup>th</sup> Street. Compost materials and biosolids may be used as soil amendment to promote the vegetation.

#### **Closure Costs for Construction and Demolition Site**

The closure costs for the City's permitted Construction and Demolition Landfill includes funding for additional soil cover, drainage improvements and re-vegetation of the landfill areas that are intended to become part of the future park area. A minimum soil cover depth of two feet is approved under the NDEQ permit.

#### **Air Quality Assessment**

The NDEQ regulations related the Clean Air Act Amendments of 1990 require landfill gas sampling every five years unless a landfill gas collection and control system is installed. This applies to both the Bluff Road Landfill and the Construction and Demolition Landfill so funding for this gas sampling study is budgeted at five year intervals. In the event that these periodic gas sampling studies do indicate that a landfill gas collection and control system must be installed, a substantial capital investment would be required. The City has included funding for the initial capital improvement needs for this potential event, but additional funding would be required should this occur. The amount of the additional funding will be dependent on a number of factors that would need to be considered at that time.

#### **Site Assessment**

Funding beyond the amounts shown may be required to address corrective actions associated with groundwater and landfill gas at the North 48<sup>th</sup> Street Landfill, which is dependent on the outcome of NDEQ review of data collected during the site assessment study.

#### **C & D Landfill Site Re-permitting**

The C & D landfill must be re-permitted every five years. The capital cost for the engineering support in the permitting process is based on the historical costs escalated by 3 percent per year to the year of expenditure.

#### **Parks Development**

Before the site can be returned to the Parks Department for use as park lands, the site will need to be improved to allow public access and use as a public park. No preliminary estimates for these improvements are available at this time.



**Future Construction and Demolition Site**

Depending on future City planning decisions in conjunction with the Solid Waste Plan Update discussed below, future funding will be required for the siting of a new construction and demolition disposal facility. The capital requirements would include funding for land purchase, permitting, design and construction of the new facility.

***Planning and Waste Diversion Improvements***

Funding requirements for planning and waste diversion programs are also include in Project 2.

**Solid Waste Management Plan Update**

An update to the Solid Waste Management Plan for the City and County will be required to obtain permit approval for any new solid waste facilities including a new MSW landfill, a construction and demolition landfill or a transfer station. Therefore, budget estimates for this plan update have been included in the capital improvement budget.

**Recycling Drop-Off Sites**

Project funding is required for the maintenance/improvements of existing drop-off site and for periodic expansion of the program. The maintenance costs include anticipated asphalt resurfacing, fencing and landscaping improvements which are critical to continue with the current use, improve the appearance and gain local support from the surrounding commercial and residential neighbors. As additional site are identified the City must have funding available to cover the site development costs associated with additional drop-off sites to provide convenient recycling opportunities without causing congestion as the City expands.

**Compost Facility Site**

The existing compost facility currently only handles grass and leaves. Brush is chipped and used as mulch. The 1992 Solid Waste Management Plan identifies an organic composting facility and the NDEQ compost facility regulations require that a compost facility larger than 100,000 cubic yards of yard waste must have a operating permit. Based on the estimated increases in yard waste generation, the existing compost facility is expected to exceed this regulatory criterion in the planning period so funding for a permit application has been included in the capital improvement budget.

If the City decides to expand the types of materials accepted for composting, it will require a feasibility study and would likely trigger an acceleration of the permit application and other site improvements. However, funding for these activities has not been included in the capital improvement budget.

**Transfer Station / Convenience Center/ Permanent Household Hazardous Waste Facility**

If the City decides to relocate or build a second transfer station site during the Solid Waste Plan Update, funding for a siting study, land purchase, permitting, design and construction would have to added to the capital improvement budget. Funding for a transfer station study in support of the Solid Waste Plan Update has been included in the budget forecast.



**Other Potential Projects**

Although the existing recyclable processing capacity is expected to be adequate to handle the material diversion from the City’s drop-off facilities, recycling program changes such as a mandatory curbside collection program could result in the need for expanded capacity during the planning period.

Electronic waste has been one of the largest growing segments of the waste stream. If recycling programs are developed targeting this waste stream component as a result of the Solid Waste Plan Update, it is likely that additional capital improvement programs would be required to manage the separation of these materials.

However, there is insufficient information on these potential programs to estimate what the City’s approach would be or what if any capital investment would be required, so the current CIP budget does not currently include any funding for these potential programs.

The City’s current short-term capital improvement projections are presented Table 6-2.

**TABLE 6-2 – SHORT-TERM CAPITAL IMPROVEMENTS**

Proj No.	Project Title	Proj Prio.	Short-Term Programmed Expenditures (000's)					
			FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
1	<b>MSW Landfill - Bluff Road</b>							
	a. Landfill Expansions - Leachate Collection and Liner Systems	A	0	200	2400	0	400	5200
	b. Site Maintenance and Closure	A	160	160	490	170	180	180
	c. Final Cover & Landfill Gas Control Systems	A	20	1250	3528	13	170	2037
	d. Leachate Collection & Treatment Facilities	B	0	0	0	0	0	200
	e. Site Re-Permitting	B	0	40	0	0	0	0
	f. Special Projects		0	0	280	0	0	1602
	g. New MSW Landfill		0	0	0	0	0	0
<b>Total - Project 1 (Landfill Revenue)</b>			<b>180</b>	<b>1650</b>	<b>6699</b>	<b>183</b>	<b>750</b>	<b>9219</b>
2	<b>Solid Waste Management Programs Other Than MSW Landfill</b>							
	a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	390	340	0	0	750	0
	b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	420	30	200	0	70	780
	c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	25	20	0	0	0	30
	d. Parks Development (N. 48th Street)	C	No funding is currently identified for the project.					
	e. Solid Waste Management Plan Update	B	0	0	0	0	0	70
	f. Future C&D Landfill Site	B	0	0	0	0	0	0
	g. Recycling Drop-Off Site Maint./Improv.	A	0	10	0	10	10	10
	h. Expansion of Recycling Drop-Off Program	A	90	45	45	45	45	45
	i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	0	60	0	60	0	60
	j. Convenience Center Transfer Station		No funding at this time; subject to SWM Plan Update decisions					
k. Groundwater Remediation (N. 48th Street)		50	200	100	UNKNOWN		0	
<b>Total - Project 2 (Occupation Tax)</b>			<b>975</b>	<b>705</b>	<b>345</b>	<b>115</b>	<b>875</b>	<b>995</b>



## **Solid Waste Facilities Plan**

To facilitate long-term planning efforts the anticipated capital improvement projects beyond the City's five year planning period have also been estimated and are shown in Table 6-3.



**TABLE 6-3 – LONG-TERM SOLID WASTE FACILITIES CAPITAL IMPROVEMENT PLAN**

Proj No.	Project Title	Proj Prio.	Long-Term Facilities Plan Expenditures (000's)									
			FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	
1	<b>MSW Landfill - Bluff Road</b>											
	a. Landfill Expansions - Leachate Collection and Liner Systems	A	389	2272	0	808	4717	0	0	574	3353	
	b. Site Maintenance and Closure	A	200	200	210	220	220	230	230	240	250	
	c. Final Cover & Landfill Gas Control Systems	A	256	2880	15	432	3967	0	0	429	3858	
	d. Leachate Collection & Treatment Facilities	B	0	1000	0	0	0	0	0	0	0	
	e. Site Re-Permitting	B	58	0	0	0	0	67	0	0	0	
	f. Special Projects		0	8	0	0	4	0	0	0	9	
	g. New MSW Landfill		0	0	0	0	0	0	0	0	0	
<b>Total - Project 1 (Landfill Revenue)</b>			<b>903</b>	<b>6360</b>	<b>225</b>	<b>1460</b>	<b>8908</b>	<b>297</b>	<b>230</b>	<b>1243</b>	<b>7471</b>	
2	<b>Solid Waste Management Programs Other Than MSW Landfill</b>											
	a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	0	0	0	0	0	0	0	0	0	
	b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	204	0	24	223	0	31	292	43	400	
	c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	23	0	0	0	35	27	0	0	0	
	d. Parks Development (N. 48th Street)	C	No funding is currently identified for the project.						0	0	0	0
	e. Solid Waste Management Plan Update	B	0	0	0	0	81	0	0	0	0	
	f. Future C&D Landfill Site	B	0	0	0	0	0	0	0	0	0	
	g. Recycling Drop-Off Site Maint./Improv.	A	12	13	13	13	14	14	15	15	16	
	h. Expansion of Recycling Drop-Off Program	A	0	0	0	0	62	0	0	68	0	
	i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	0	76	0	81	0	86	0	91	0	
	j. Convenience Center Transfer Station		295	0	0	0	0	0	0	0	0	
k. Groundwater Remediation (N. 48th Street)		UNKNOWN		0	0	0	0	0	0	0		
<b>Total - Project 2 (Occupation Tax)</b>			<b>534</b>	<b>89</b>	<b>37</b>	<b>317</b>	<b>192</b>	<b>158</b>	<b>307</b>	<b>217</b>	<b>415</b>	



**TABLE 6-3 – LONG-TERM SOLID WASTE FACILITIES CAPITAL IMPROVEMENT PLAN (CONT'D)**

Proj No.	Project Title	Proj Prio.	Long-Term Facilities Plan Expenditures (000's)								
			FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
1	<b>MSW Landfill - Bluff Road</b>										
	a. Landfill Expansions - Leachate Collection and Liner Systems	A	0	0	0	0	0	0	0	0	0
	b. Site Maintenance and Closure	A	260	260	270	280	290	300	310	320	330
	c. Final Cover & Landfill Gas Control Systems	A	404	3386	644	5732	580	5243	652	6675	24
	d. Leachate Collection & Treatment Facilities	B	0	0	0	0	0	0	0	0	0
	e. Site Re-Permitting	B	0	78	0	0	0	0	90	0	0
	f. Special Projects		0	0	0	0	0	0	0	0	0
	g. New MSW Landfill		0	331	809	96	361	2976	15329	8329	0
<b>Total - Project 1 (Landfill Revenue)</b>			<b>664</b>	<b>4055</b>	<b>1722</b>	<b>6108</b>	<b>1232</b>	<b>8520</b>	<b>16381</b>	<b>15324</b>	<b>354</b>
2	<b>Solid Waste Management Programs Other Than MSW Landfill</b>										
	a. Closure Costs for Landfill East (310 acres) and Landfill West (140 Acres) (N. 48th Street)	A	0	0	0	0	0	0	0	0	0
	b. Closure Costs for Construction and Demolition Landfill (N. 48th Street)	A	0	0	0	0	0	0	0	0	0
	c. Air Quality Assessment (Tier II) & Site Re-Permitting (N. 48th Street)	B	40	0	0	0	0	0	0	0	0
	d. Parks Development (N. 48th Street)	C	0	0	0	0	0	0	0	0	0
	e. Solid Waste Management Plan Update	B	94	0	0	0	0	109	0	0	0
	f. Future C&D Landfill Site	B	0	0	5618	96	99	186	0	3947	110
	g. Recycling Drop-Off Site Maint./Improv.	A	16	17	17	18	18	19	19	20	20
	h. Expansion of Recycling Drop-Off Program	A	72	74	0	79	0	84	0	89	0
	i. Composting Facility Site Maintenance/Improvements (Bluff Road)	A	96	0	102	0	108	0	115	0	122
	j. Convenience Center Transfer Station		0	0	0	0	0	0	0	0	0
	k. Groundwater Remediation (N. 48th Street)		0	0	0	0	0	0	0	0	0
<b>Total - Project 2 (Occupation Tax)</b>			<b>319</b>	<b>91</b>	<b>5737</b>	<b>193</b>	<b>226</b>	<b>397</b>	<b>134</b>	<b>4056</b>	<b>252</b>



## **Appendices**

**Appendix A, Bluff Road Operating Permit**

**Appendix B, North 48<sup>th</sup> Street Operating Permit**

**Appendix C, Transfer Station Operating Permit/Operating Plan**

**Appendix D, Bluff Road Capital Improvements Budget – Cost Estimates**

**Appendix E, North 48<sup>th</sup> Street Capital Improvements Budget – Cost Estimates**

**Appendix F, Transfer Station Capital Improvements Budget – Cost Estimates**

**Appendix G, Waste Diversion Capital Improvements Budget – Cost Estimates**

**Appendix H, Historical Rates and Current Rate Resolution**

**Appendix I, City Ordinance – Occupation Tax Ruling**

**Appendix J, Facility Location Maps**