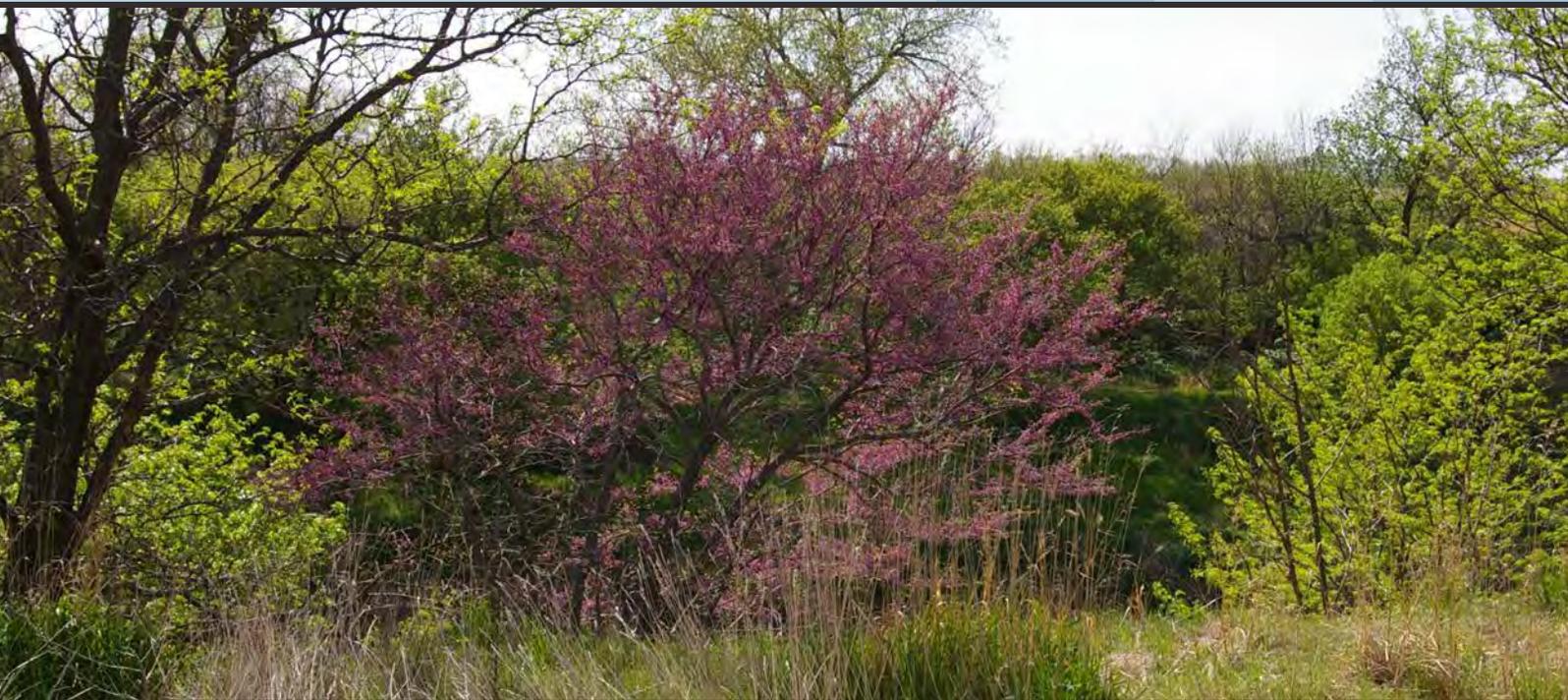


NORTH 48TH STREET LANDFILL END USE
DATABOOK

JULY 14,
2014

City of Lincoln, Nebraska



Acknowledgements

Steering Committee Members

- Frank Uhlarik, Public Works and Utilities Department, City of Lincoln
- Karla Welding, Public Works and Utilities Department, City of Lincoln
- Terry Genrich, Parks and Recreation Department, City of Lincoln
- Ben Higgins, Public Works and Utilities Department, City of Lincoln
- Sara Hartzell, Planning Department, City of Lincoln
- Jocelyn Golden, Law Department, City of Lincoln
- Nancy Clark, Lincoln-Lancaster County Health Department
- Ralph Martin, Lincoln-Lancaster County Health Department



Prepared by:

SCS AQUATERRA

14755 Grover Street
Omaha, Nebraska 68144
(402) 884-6202

AND

vireo

Table of Contents

01	Introduction
02	Overview
03	Site History
04	Demographics
05	Land Use
06	Transportation
07	Natural Resources
08	Waste Management Operations
09	Opportunities and Constraints

This page left intentionally blank.



Introduction

The purpose of this databook is to provide background and supporting information for the development of the North 48th Street Landfill End Use Plan. The Databook will be a companion resource document to the plan, and will provide the following during the planning process:

- Relevant information about the North 48th Street Landfill Planning Area, including existing conditions, trends, and key issues that will serve as a foundation for recommendations.
- Information about past, on-going, and planned initiatives.
- An understanding of planning and development in the landfill context.
- A frame of reference for the development of a vision as well as goals, objectives and policies.

Purpose of the End Use Plan

The North 48th Street Landfill End Use Plan will recommend strategies to help realize the community's vision for the future and provide a proactive, comprehensive framework to guide decisions on recreational uses, infrastructure and public services at the North 48th Street Landfill.

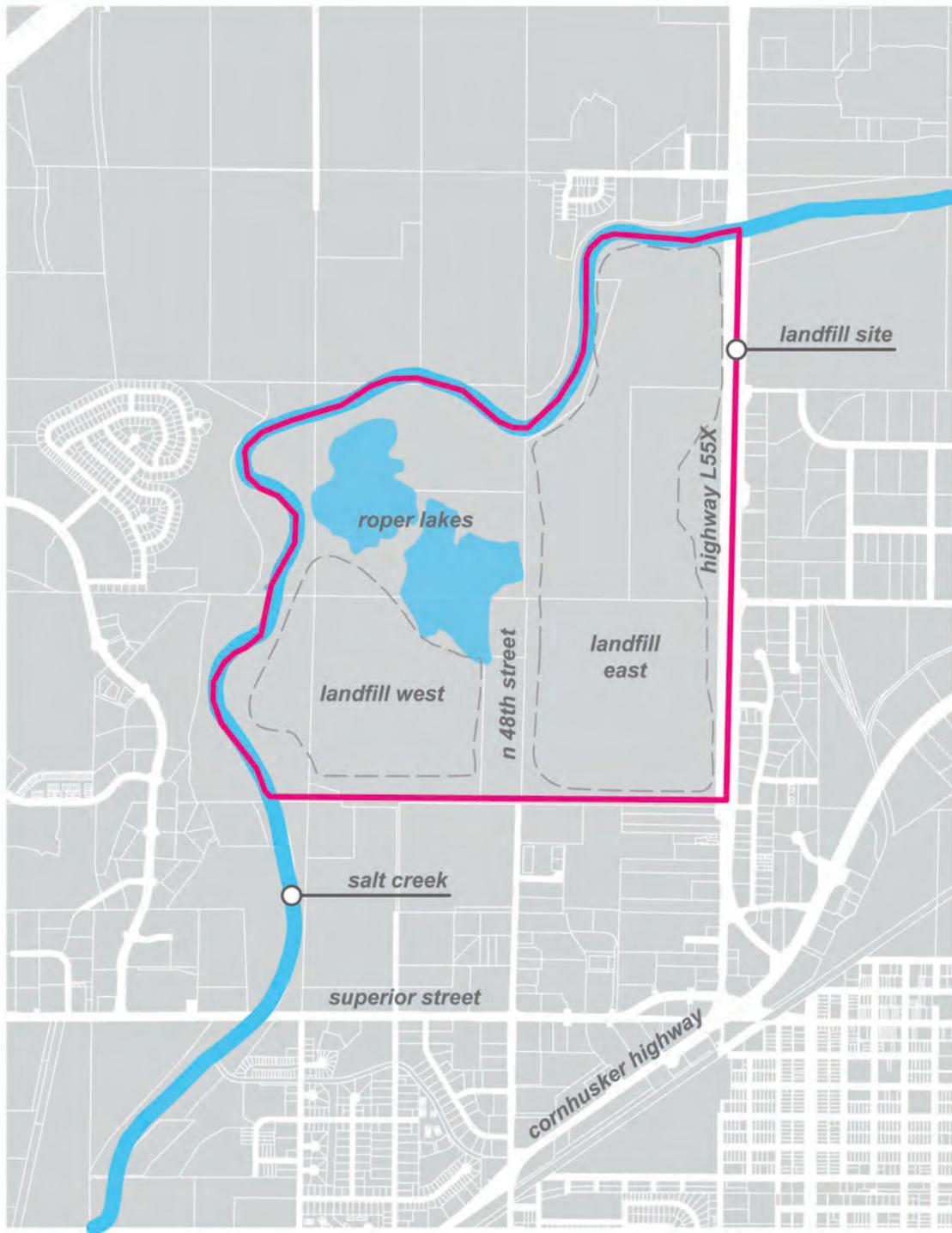


Overview

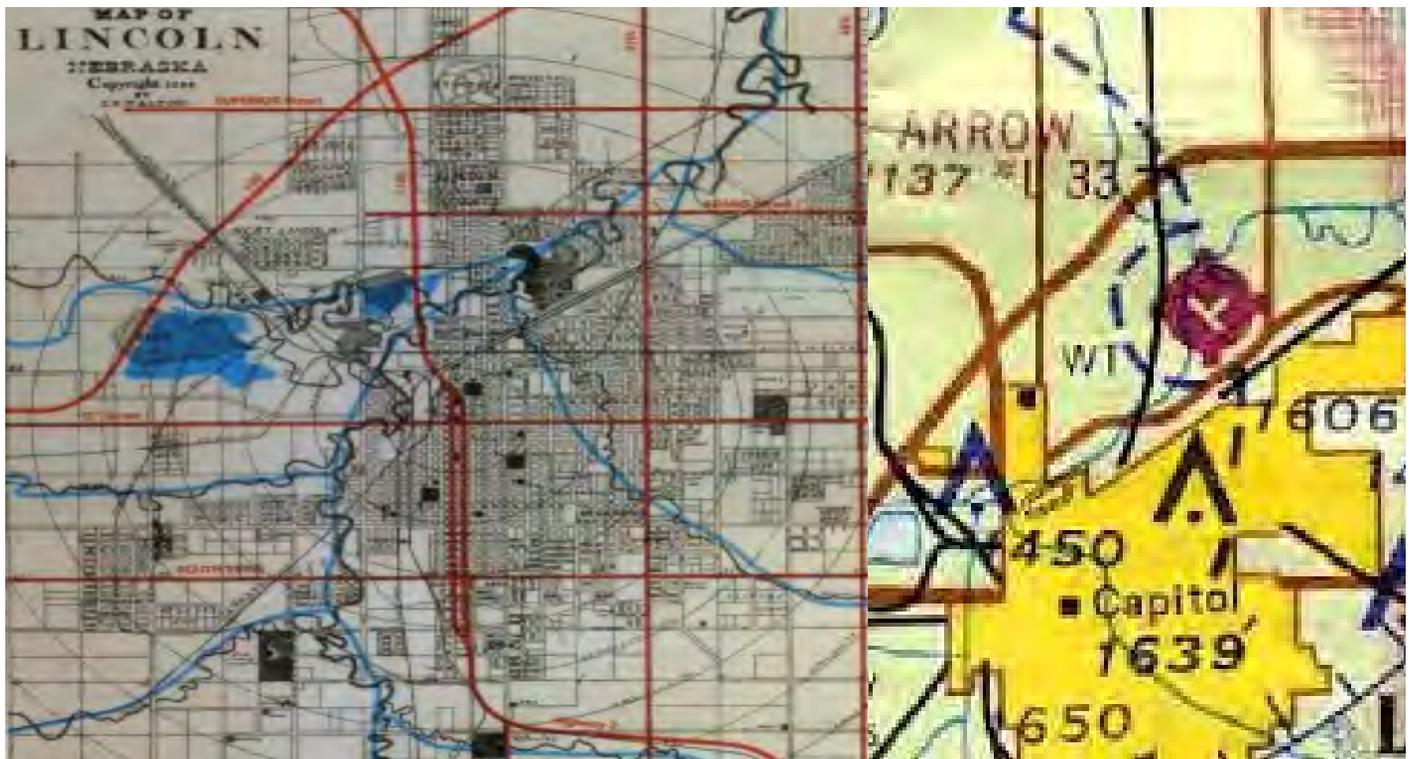
The North 48th Street Landfill (Site) is located at 5101 North 48th Street in Lincoln, Nebraska. The Site has historically operated as a municipal landfill and currently operates a Construction and Demolition Debris (C&D) landfill and other solid waste management activities on the property. The Site benefits from many natural resources including: wetlands, streams, vegetation, and wildlife. Major challenges include integrating end uses while maintaining solid waste operations, safety and providing for controlled public access.

The Site planning area encompasses approximately 570 acres. The planning area includes existing landfill facilities and natural features such as:

- Scale house and truck scale
- Small vehicle transfer station
- Recyclable materials drop-off area
- Yard waste drop-off area
- Wood waste drop-off area
- Materials distribution area (compost and/or wood chips)
- Appliance de-manufacturing facility
- Oil, scrap tires, scrap metal and spent battery drop-off area
- Maintenance building
- Floodplain
- Remnant Saline Wetlands
- Roper Lakes
- Riparian Corridor along Salt Creek



*maps created with GIS data from the following sources:
USGS, USDA, NRCS, Lincoln/Lancaster Co. GIS, University of Nebraska-Lincoln GIS data



Site History

The City of Lincoln and Lancaster County lie within the Platte River Valley in southeastern Nebraska. Natural features include uplands, stream terraces, and bottom lands. Historically the region was covered by native tallgrass prairie that served as home to buffalo, antelope, grassland birds, and many other species of plants and animals. The Site is located at the northern boundary of the incorporated city limits.

In the late 1920's the western portion of the Site was developed as the Arrow Airport. Arrow Airport was utilized initially by Arrow Aircraft as a testing location for the airplane manufacturer's new airplanes. After Arrow Aircraft closed, the airport remained as a contract flying school and a small civilian airport. The airfield was closed in 1979. This portion of the Site, currently known as Landfill West, began accepting municipal solid waste in 1981 and ceased in 1990.

Prior to landfill development in 1956, the eastern portion of the Site (Landfill East), was predominantly undeveloped and rural land. As depicted in a 1957 aerial photograph, the northern portions of Landfill East were dominated by lakes, and saline wetlands, adjacent to Salt Creek. Landfill East began accepting municipal solid waste in 1956 and ceased in 1981. To the northwest, during the 1940s and 1950s, organized hunts and retrieving dog trials were routinely held at Roper Lakes. Through the years, land changes around Roper Lakes altered the ponds and wetlands boundaries.

Landfill East and Landfill West comprise approximately 300 acres of the 570 acre site. The City operates a C&D Landfill on top of a portion of the closed area known as Landfill East. The construction and demolition debris is filled on top of previously placed (trenchy filled) municipal waste in part to reduce infiltration of precipitation and surface water into the waste mass. The separate C&D Landfill extends the life of the current municipal solid waste landfill, Bluff Road Landfill. Prior fill areas are closed with ongoing regulatory obligations for closure and post-closure care. It is currently anticipated that the C&D Landfill will continue operation until 2030.

Historic Aerials



Over time, the landscape has been altered for landfill development. Vegetation has occurred in areas that were previously covered by surface waters.

As depicted in the 1957 aerial photograph, a meandering stream was once present throughout Landfill East. By 1979 this stream is no longer present.





Demographics

Analysis of demographic trends helps to provide insights into potential strengths and opportunities for end use plans for the North 48th Street Site. The following demographic analysis is based on data obtained from the 2010 United States Census. End use activities at the Site are anticipated to serve the entire region; therefore demographics and trends were assessed at a citywide and/or county level.

- Between 2000 and 2010, the population of Lincoln increased by 14.5%. According to the 2010 Census, the population of the City of Lincoln is 258,379.
- Lancaster County's population is 286,126. Average annual population growth is 1.26% and is consistent with the expected growth rate projected in the City's 2040 Lincoln/Lancaster Comprehensive Plan.
- Population projections for Lancaster County show that the growth of the population and households will continue between 2010 and 2040 as it has every decade since 1900. The population is expected to increase to more than 410,000 by 2040.
- The Lincoln Public School (LPS) district provides kindergarten through 12th grade education to approximately 35,000 students within the City of Lincoln and the surrounding area. The district operates 37 elementary schools, 11 middle schools, six high schools, and seven other alternative and special focus program sites.
- The median age of the population in Lincoln is 31.8 years.
- In 2010, there were 60,000 families in the City.
- Median household income in Lincoln is \$47,526 compared to \$49,770 for the state of Nebraska.



Land Use

This section provides land use and development summaries for the North 48th Street Site including: existing land use, existing zoning, ownership, future land use, and parks and recreation. These summaries will guide recommendations on future end use plans, identification and protection of existing assets, and identification of specific areas within the Site that are poised for redevelopment.

North- Land use to the north is a mix of both agriculture and environmental preserve. Per the future land use map, the areas shown as agricultural uses will be developed into residential. Salt Creek is the northern boundary of the Site. There is also an area of current and future commercial development adjacent to the northeast corner of the Site. The I-80 corridor is approximately one mile north.

East- The Site is bounded to the east by North 56th Street. Existing and future land use is mapped as commercial and industrial. A Burlington Northern Santa Fe railroad line is located 0.5 mile southeast of the Site. The land east of the Site is zoned as an industrial district.

South- Land use to the south is primarily industrial and commercial – with a mixture of both light and heavy industries. It is anticipated that these areas will remain industrial and commercial according to the City's future land use maps. Boosalis Park and several shooting/skeet/archery ranges are located adjacent to the Site. The Food Bank of Lincoln and the Doris Bair Softball Complex are also located south of the Site, east of North 48th Street. In addition, there is a residential property located to the south of the Site.

West- Land use to the west currently includes a mixture of open space, residential, commercial and semi-public uses (education/schools). Salt Creek is the western boundary of the Site. Lincoln North Star High School is located 0.5 mile to the west. According to future land use and zoning maps, land use to the west will continue to be developed in this manner.



future land use

- agricultural stream corridor
- commercial
- industrial
- public/semi-public
- residential
- environmental resources/ green space

existing land use

- agricultural production
- residential
- churches/synagogues/ temples
- commercial
- public/semi-public
- heavy industrial
- light industrial
- parking lot
- railroad/vacant/vacated row
- streams/creeks
- environmental preserves/ open space/park land/ grassland/forestland

zoning

- agriculture district
- business district
- commercial district
- industrial district
- employment center district
- office park district
- public use district
- residential district

vacant land

parks, open space & preserves



Parks and Open Space

Lincoln has more than 6,000 acres of parks and natural land and more than 128 miles of trails. The recreational goal of the community is to have a park area within one-half mile walking distance of each residence (Lincoln/Lancaster 2040 Comprehensive Plan). Lincoln has 125 parks with more than half of them identified as neighborhood and mini-parks. A variety of existing parks, preserves, and open space exist adjacent and surrounding the Site. These areas include:



- Parks and open spaces associated with the high school and residential areas (west), including Steven Schleich Park, a four acre neighborhood park.
- Whitehead Saline Wetland and Schleich Wetland, managed by the Lower Platte Natural Resources District (LPNRD) and additional preserve acreage located east and north adjacent to the Site.
- Doris Bair Softball Complex, which currently consists of seven fields and associated structures and parking adjacent to the southeastern side of the Site (approximately 23 acres).
- Boosalis Park, a 66 acre conservancy park that includes an archery and gun range, located adjacent to the southern side of the Site.
- Lincoln Shooting Sports Foundation owns a 10 acre parcel of land, west adjacent to Boosalis Park and south of the Site. The Lincoln Gun Club owns a 43 acre site east of Boosalis Park and adjacent to the southern side of the Site.
- In addition to municipal and private recreational uses adjacent to the Site, the northwest section of the Site is currently used by the Nebraska Game and Parks Commission for youth mentor hunts.





Transportation

This section provides a brief summary of the transportation infrastructure, trails and access in the vicinity of the Site. To protect public safety and manage the security of the landfill, operational access and public access will be considered throughout the End Use planning process.

Major Roads

The Lincoln Metropolitan Planning Organization adopted the *Lincoln 2040 Long Range Transportation Plan* in December 2011. Major roads located on and adjacent to the Site include and their associated functional classification are listed below:

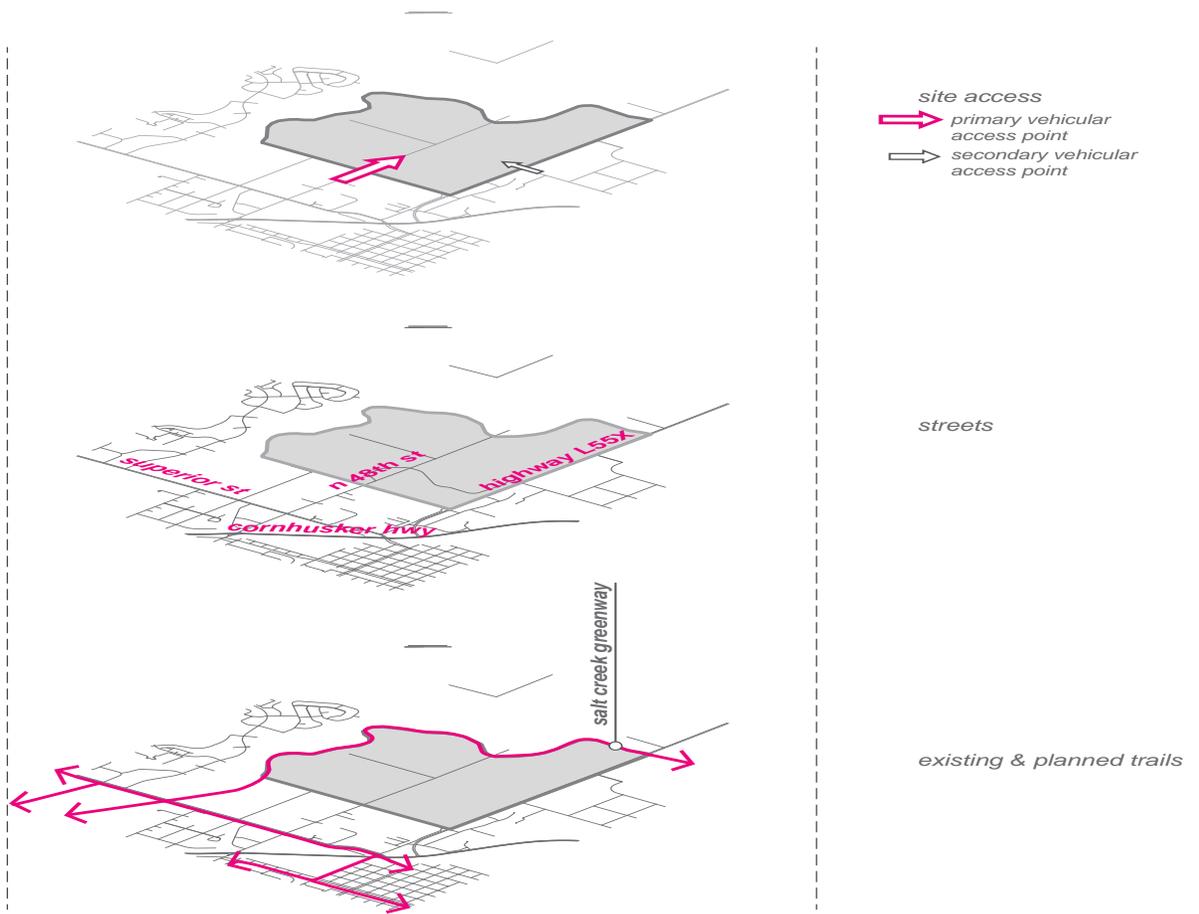
- Cornhusker Highway or Highway 6, located south and east of the Site, is classified as a principal arterial between the City center to the southwest and northeast to I-80.
- The main access road to the Site, North 48th Street, is classified as an urban collector and minor arterial in the site vicinity. North 48th Street runs north/south through the City.
- North 56th Street, along the eastern boundary of the Site, intersects with Cornhusker Highway to the south and has a direct connection to I-80 to the north. North 56th Street is classified as a principal arterial in the site vicinity. North 56th Street is also L55X, a State Highway spur. The Nebraska Department of Roads controls the right-of-way of L55X.
- I-80 is located approximately one mile to the north.

Principal arterials and minor arterials carry traffic between major activity and population centers. They may run for many miles across the City and County. Posted speed limits are generally in the 35 to 45 miles per hour range in urban areas, (higher in rural areas) with access provided at grade. Traffic signals as well as roundabouts are often used to regulate the flow of traffic at major intersections along arterials. Access is managed, although movement to and from adjacent property is sometimes allowed depending upon the character of the area and the uses being served.

Collector streets offer motorists a safe and convenient way to move from a neighborhood to the arterial street system. This level of street classification is intended to “collect” traffic from residential or other destinations and move it to the higher order streets. Speeds are generally lower than arterial streets with direct access more liberally granted.

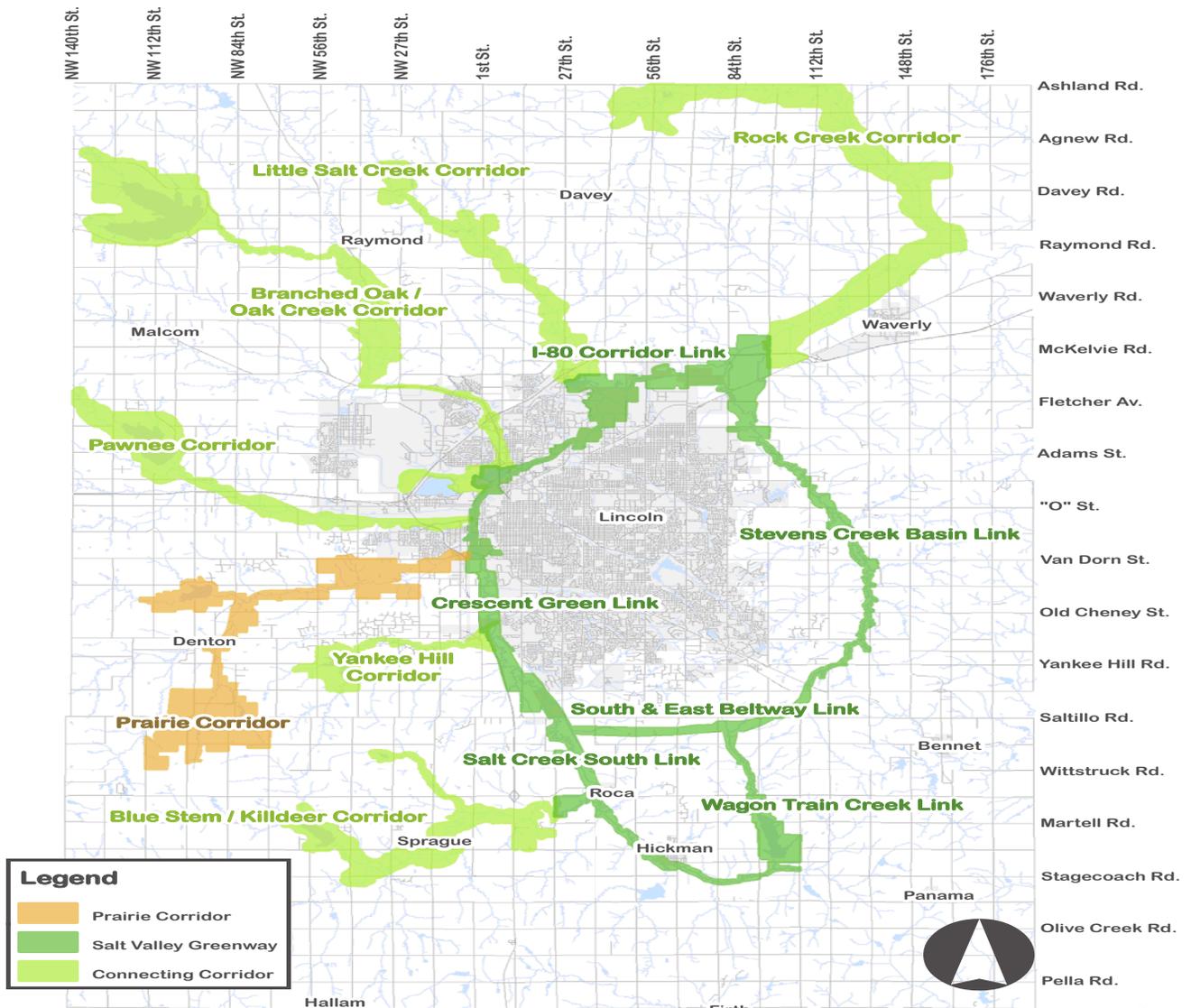
Access

The Site has two existing points of access. The first and primary access point is situated at the southern portion of the Site, using North 48th Street. Alternatively, the Site can be accessed from North 56th Street at Fletcher Avenue. Currently the south entry is the only public access point, which is used to access the weigh station and other facilities at the Site. The entry at Fletcher Avenue is used by City/employee vehicles, select contractors and approved mentors for youth hunts. Public access/public use of the Site for waste disposal during Daylight Saving Time is: Monday -Friday 6:45 am – 6:00 pm, Saturday, 6:45 am – 3:00 pm, and Sunday, 6:45 am – 12:00 pm. Winter public access/public use hours are: Monday -Friday 6:45am-4:15pm. (see Site Map).



Trails

The Site is adjacent to multiple, existing and planned trail routes. Of particular importance is the Salt Valley Greenway, which will be part of a City-Wide Greenway system. According to the Lincoln/Lancaster County Comprehensive Plan, the concept of a linear greenway along Salt Creek as it runs through the Lincoln urban area has been in the City's Comprehensive Plan since 1961. The "Crescent Green Plan" was created in 1977 and called for a park to be created along Salt Creek from Wilderness Park north to the landfill (Site).



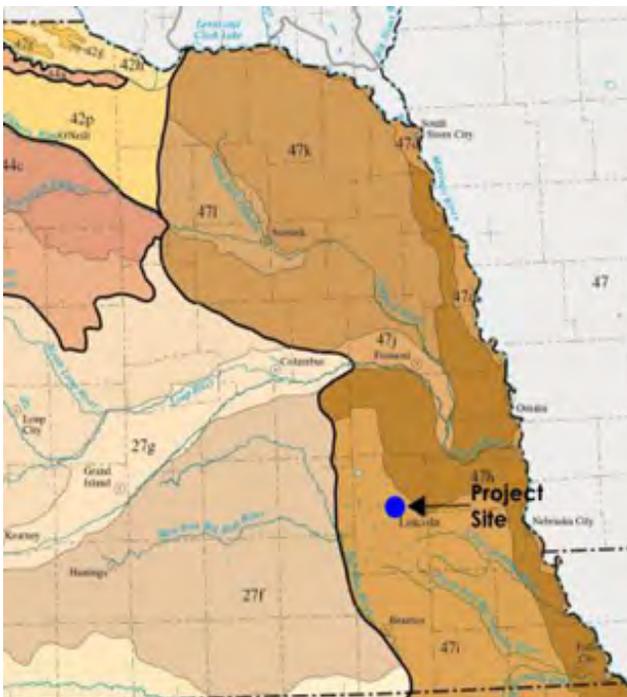
Salt Valley Greenway and Connecting Corridors. (source: Master Plan for Salt Valley Greenway and Prairie Corridor, 2012)



Natural Resources

This section provides a description of existing natural resources and conditions at the Site. These summaries will guide recommendations on future end use plans by identifying natural assets and existing resources that can be incorporated into the end uses of the Site.

Southeastern Nebraska lies within the Nebraska/Kansas Loess Hills ecoregion which is part of the larger Western Corn Belt Plains ecoregion. This ecoregion is characterized by dissected loess hills with deep, silty, well drained soils that historically supported tallgrass prairie vegetation with oak-hickory forests located along streams (see ecoregion map below).



Topography and Soils

Topography within the region consists of low, rolling hills with areas of exposed glacial till. Dakota sandstone present in this region is the only underlying rock formation that is naturally exposed. Soils, with the exception of those within the wetland complex, have been modified significantly due to the use of the site as a landfill. However, the soils within the wetland complex should be relatively intact consisting predominantly of Salmo silty clay loam and Colo silty clay loam.

Water Resources

The Salt Creek Watershed located in southeastern Nebraska, encompasses an area approximately 2016 square miles in size that includes the City of Lincoln and the Site.

Level IV Ecoregions of Kansas and Nebraska- Site designated as Loess and Glacial Drift Hills (source: EPA)

This watershed is part of the much larger Lower Platte South Watershed. An extremely unique aspect of this watershed is the presence of saline streams and wetlands resulting from salt deposits and leaching from the underlying Dakota sandstone.

Salt Creek, for which the watershed is named, is the primary stream system within the watershed. It is approximately 52 miles long and flows northeast to the Platte River. Salt Creek forms the western and northern boundary of the Site. Historically, a tributary to Salt Creek meandered through the eastern and south central portion of the Site. During the 1950s and 1960s, this tributary was lost as the landfill site developed and flood control projects were implemented on the main Salt Creek stream channel. Over time, Salt Creek has cut down into the underlying landscape creating very steep and high (20-30 feet) stream banks. This has resulted in a hydrologic disconnect between Salt Creek and the surrounding wetlands. Thus, many of these wetlands no longer have the water regime necessary to maintain the unique hydric (water loving) vegetation.

Inland saline wetlands (salt marshes) are rare ecosystems found in eastern Nebraska and are considered the State's most rare and threatened natural community. Historically, the Site contained some of Lincoln's highest quality saline wetlands. One of these wetlands, Roper Lakes, located in the northwestern portion of the Site was noted as a prominent waterfowl hunting area in the 1940s and 1950s. The Nebraska Game and Parks Commission (NGPC) have categorized most of the saline wetlands within Lancaster County in an effort to manage and protect this unique ecosystem. The remaining wetlands within the project site are categorized as "Category I: Site currently provides saline wetland functions of high value or has the potential to provide high values following restoration or enhancement measures." These wetlands fall into the latter part of this description due to the current dominance of invasive, exotic vegetation and the lack of a good hydrologic connection to Salt Creek.



Vegetation



Vegetated communities within the Site are indicative of a highly altered landscape with a majority of the Site having been utilized for the landfill. Currently, the active portion of the landfill is located in the east central portion of the Site. The remainder of the landfill is capped and vegetated with a mix of cool season grasses. A wetland complex remains within the northwestern portion of the Site.



The wetland complex contains a mix of marsh and bottomland forest vegetation. The northern part of this area is largely bottomland woodland with a mix of cottonwood (*Populus deltoides*), Siberian elm (*Ulmus pumila*), honey locust (*Gleditsia triacanthos*), green ash (*Fraxinus pennsylvanica*), willow (*Salix sp.*), and eastern red cedar (*Juniperus virginiana*). The understory is dominated by smooth brome (*Bromus inermis*), poison hemlock (*Conium maculatum*), reed canary grass (*Phalaris arundinacea*), western wheatgrass (*Andropogon smithii*), phlox (*Phlox divaricata*), and fescue (*Festuca sp.*).



wetland complex

The two large wetlands (Roper Lakes and the adjacent pond) are dominated by an invasive exotic species of common reed (*Phragmites australis*) and cattails (*Typha sp.*). Smartweed (*Polygonum sp.*) and horsetail (*Equisetum sp.*) were also noted within the wetlands. The City has been working with the Lancaster County Weed Authority to treat the reed and cattails by aerial spraying of herbicides. Treatment has resulted in a large amount of dead vegetation lying within the wetlands that will likely inhibit the growth of desirable vegetation as well as continued control of the undesirable invasive vegetation if it is left in place. There may be a remnant seed base of plants more indicative of saline wetlands that could emerge with the control of invasives and restoration of hydrology within these wetlands. One small pool of water was found on the northern side of the wetland complex that has sedges and rushes present.

Characteristic Vegetation-North 48th Street Site



Vegetation within the transition zone, the area between the wetlands and the uplands consists of grasses including smooth brome (*Bromus inermis*), fescue (*Festuca sp.*), prairie cordgrass (*Spartina pectinata*), Indian grass (*Sorghastrum nutans*), and switch grass (*Panicum virgatum*), see pictures below..



Vegetation within the riparian (stream) corridor along Salt Creek is dominated by cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), hackberry (*Celtis occidentalis*), and boxelder (*Acer negundo*). The width of the riparian corridor is generally quite narrow but does widen out in locations where there is a lower flood bench adjacent to the stream. The understory vegetation consists of smooth brome (*Bromus inermis*), wild rye (*Elymus sp.*), switch grass (*Panicum virgatum*) and patches of prairie cordgrass (*Spartina pectinata*).



riparian corridor

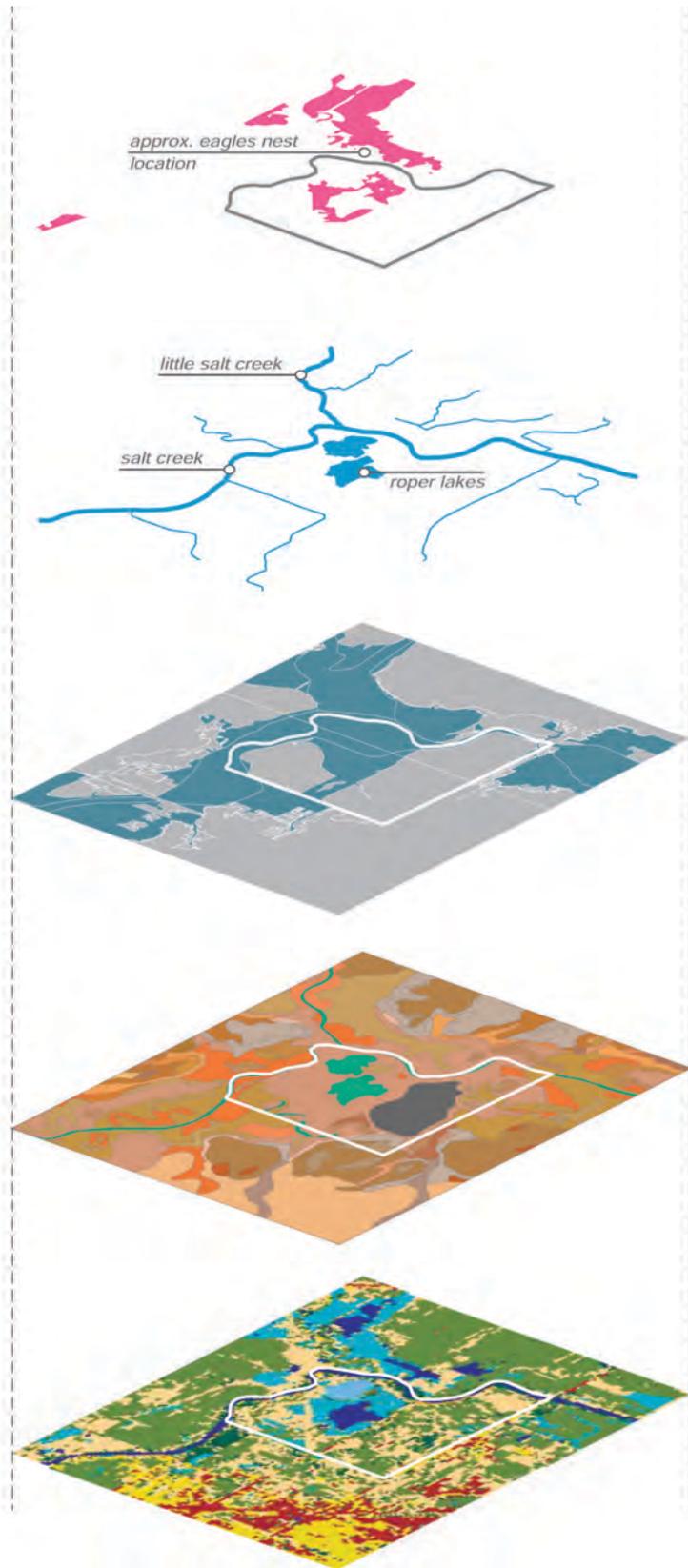
Wildlife

Wildlife species were noted throughout the site assessment either by visual sightings of species or indicators such as tracks and/or scat. White-tailed deer (*Odocoileus virginianus*) and wild turkey (*Meleagris gallopavo*) are the prominent wildlife seen throughout the site. Neotropical songbirds such as sparrows, eastern kingbirds (*Tyrannus tyrannus*), eastern meadowlarks (*Sturnella magna*), mourning doves (*Zenaidura macroura*), and red-winged blackbirds (*Agelaius phoeniceus*) were also seen throughout the Site. Cliff swallows (*Petrochelidon pyrrhonota*) were commonly noted along Salt Creek and within the wetland complex. A nesting eagle is present in the northern portion of the Site. While not seen, it is likely that coyote (*Canis latrans*) and other small mammals use the Site given the cover available within the wetland complex and along Salt Creek.

In “City Birding: True Tales of Birds and Birdwatching in Unexpected Plances” (2003), Paul A. Johnsgard refers to the Site as “One of Lincoln’s greatest ornithological gems”. In his years birding on the Site, Johnsgard has noted a variety of songbirds, shorebirds, waterfowl, and birds of prey, as well as amphibians, reptiles and mammals utilizing the Site throughout the year. He has taken numerous ornithology classes to the Site and continues to enjoy that the Site offers beauty that take root and thrive, even over the landfill.



Shown above: Turkey tracks and visible dust bath, wild turkey and white-tailed deer.



saline wetlands

streams & lakes

fema flood hazard zone

- ae | 1% annual chance flood risk
- x | minimal flood hazard

soils

- colo silty clay loam
- crete silty clay loam
- crete variant silty clay loam
- kennebec silt loam
- lamo silty clay loam
- salmo silty clay loam
- salmo silty clay loam, channeled
- sanitary landfill
- wabash silty loam
- water

gap analysis
(represents biodiversity)

- deciduous forest/woodlands
- lowland tallgrass prairie
- upland tallgrass prairie
- agricultural fields
- open water
- aquatic bed wetland
- emergent wetland
- riparian shrubland
- riparian woodland
- low intensity residential
- commercial/industrial/transportation

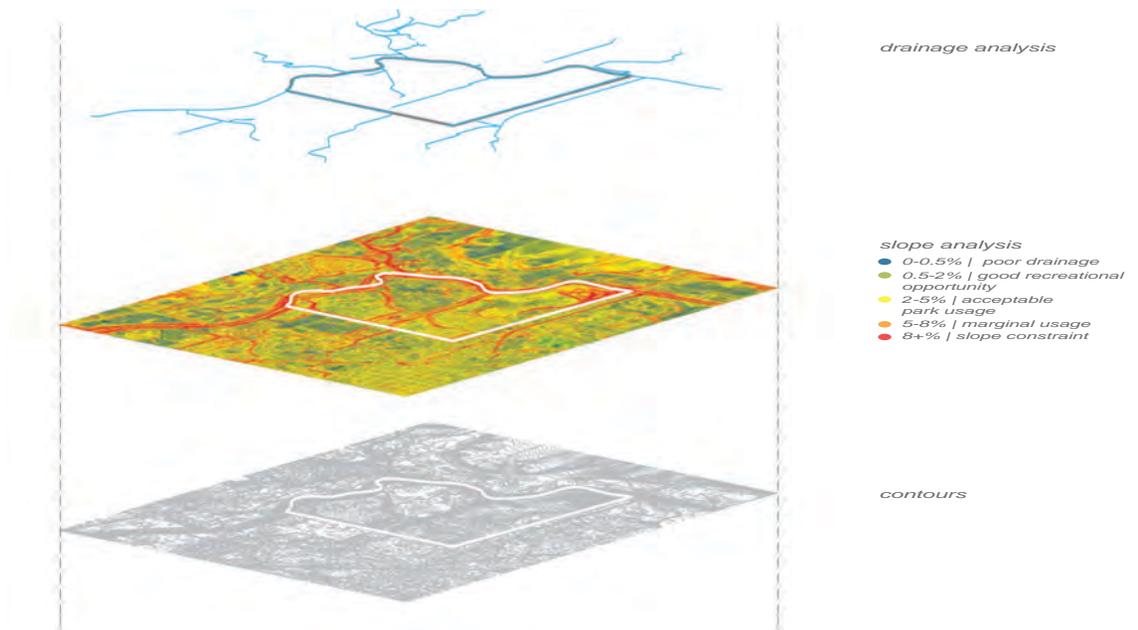


Drainage

Drainage on the Site is a combination of surface flow to Salt Creek and Roper Lakes, and two major drainage-ways; ‘Goodyear Ditch’, which is a large ditch on the south boundary and a large North-South ditch that generally follows the path of the main drive through the Site.

Flooding Hazard Zone

According to the FEMA flood mapping, the majority of the landfill areas are in the 500-year floodplain or Zone X. However, the areas encompassing Roper Lakes and, more importantly, the entry road are located within the 100-year hazard zone, Zone AE.



Topography

Generally, the Site is relatively flat with the majority of slopes falling within 2%-5% range, making the topography acceptable for recreational uses. There are some areas of steep grades, but they are constrained primarily in drainage swales and the large earthen mound in the northeast corner of the Site. There are some areas that are very flat and potentially poorly drained, which include the Roper Lakes and wetland areas, and areas in the northern section of Landfill East.

There are generally three major high points on the Site – A central high point within Landfill West, the final C&D Landfill, and the large earthen mound in the northeast corner of the Site. While these areas are not generally beneficial to recreational uses, they provide opportunities for views of the Site and surrounding areas, including a view of downtown Lincoln from the high point in the north-eastern corner.





Waste Management Operations

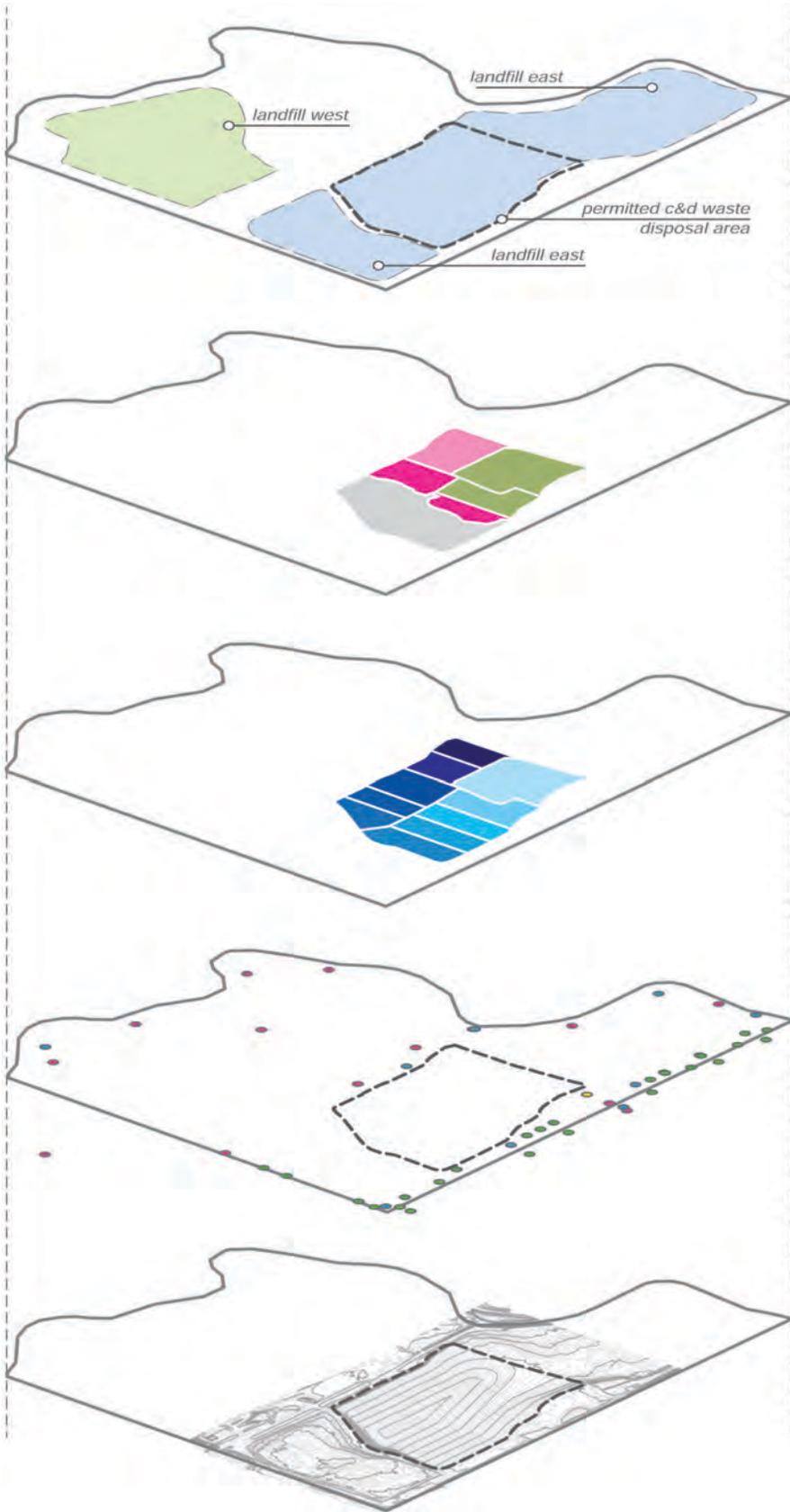
This section provides a summary of the waste management operations and facilities on the Site. These summaries of continuing obligations, land use restrictions and permit requirements will help shape the understanding of how to plan end uses that will complement existing and future landfill operations on the Site.

Existing and Future Waste Management Facilities

The City of Lincoln operates a small vehicle drop off and Municipal Solid Waste transfer station adjacent to the Construction and Demolition (C&D) landfill. This operation is in support of area residents and serves to minimize small vehicle access to the Bluff Road Landfill. In addition to these operations, the City provides yard and wood waste drop off areas, an appliance de-manufacturing operation, recycling drop off area, and used oil collection operation. These activities and associated infrastructure are expected to continue into the future concurrent with the C&D disposal activity. Additional onsite buildings include the scale house, maintenance building, and storage building. A community household hazardous waste facility is currently being planned and discussed, with possible location at the Site.

Construction and Demolition Debris Landfill

A total of 121 acres of the North 48th Street Site are permitted for C&D disposal activity. To date, 40 acres have received final cover. Disposal is expected to continue through 2030 based on current volume estimates. Scale house and road networks must be maintained to support the continued C&D disposal operations and public access (current and future) must be appropriately controlled to facilitate the continued safe access to the disposal area for waste haulers and to minimize unauthorized access to this disposal area. Additionally, associated with the C&D disposal activity, surface run-on and run-off controls must be maintained. These controls include drainage channels around the perimeter of the disposal areas, culverts at road crossings, berms and terraces on the side slopes of the waste mass, let-down structures, and erosion controls such as riprap and similar best management practices.



general landfill operations

construction & demolition fill areas

- area capped
- active c&d fill area as of 2010 survey
- lateral expansion area
- remaining c&d fill area to be filled

fill & closure sequence

- 26 acres | capped 2005
- 14 acres | capped 2009
- 11 acres | capped 2013
- 11 acres | 2016
- 12 acres | 2020
- 8 acres | 2022
- 8 acres | 2024
- 13 acres | 2025
- 9 acres | 2027
- 9 acres | 2030

observation structures

- landfill gas monitoring probe
- ground water monitoring well
- piezometer
- observation well

landfill finished grade





let down structures

Landfill Cover

Nebraska Department of Environmental Quality Title 132 – Integrated Solid Waste Management Regulations require that final cover be placed within six months of the last receipt of waste in areas which have reached final completion of disposal activity. The North 48th Street Site has received a variance from NDEQ and the final cover will consist of at least two feet of earthen material capable of sustaining adequate vegetative cover (Title 132 typically requires three feet of earthen material).

Interim cover material shall also be placed to 1) adequately control vectors, fires, and blowing litter; and 2) avoid ponding of precipitation and maintain cover integrity. In support of the Title 132 design and operational requirements, let down structures (shown above) are placed in areas of final cover to promote the rapid run-off of stormwater and to prevent excessive soil erosion and compromise of final cover.

In addition to the Title 132 requirements, maintenance of the landfill capping system for the closed municipal solid waste landfill areas (Landfill East and Landfill West) is also a selected remedy under the Title 118 Remedial Action Plan (RAP) in support of the Remedial Action Objectives (RAO). Through a program of inspection and repair, downward migration of precipitation through the final cover and into the waste will be reduced and the cover system will serve as a barrier to protect from exposure to waste. The landfill cover for the closed municipal solid waste landfill areas will be reviewed annually by the City and appropriate measures taken as needed, including:

- Establish vegetation to prevent and eliminate bare areas
- Restore the soil cover if erosion occurs and exposes waste
- Remove sediment from stormwater ditches and drainage structures

Continued maintenance of the final cover systems will occur for decades into the future. Differential settlement will necessitate additional soils placement to maintain proper grades and stormwater management. Landfill West was closed to final grade and is currently being recapped to address significant differential settlement, ponding water and issues with dispersive soils. Future soil cover projects are planned to eventually bring this area to final grade.

Landfill Access

NDEQ Title 132 requires that public access to the C&D Landfill be controlled to prevent unauthorized vehicular traffic and illegal dumping. Regulations allow for the use of artificial and/or natural barriers to be used for these purposes and the North 48th Street Site uses both. As shown, a perimeter fence has been constructed along the eastern and southern boundaries of the Site and access gates are present for the main access to the site at North 48th Street and at North 56th Street and Fletcher Avenue. Salt Creek on the northern and western boundaries and the Goodyear Ditch along the southwestern boundary serve as natural barriers to the C&D Landfill.





groundwater wells



landfill gas system

Groundwater System

Groundwater contamination at the North 48th Street Site was identified in the early 1990s and in 1992 the NDEQ requested that the City voluntarily comply with the NDEQ Title 118 – Groundwater Quality Standards and Use Classification Regulations. Since that time, a Site and a Remedial Action Plan has been developed to address the identified trichloroethene (TCE) contamination with specific RAOs that include:

- Protect aquatic receptors from exposure to unacceptable levels of TCE originating from site groundwater releases into Salt Creek
- Protect the public from exposure to unacceptable levels of TCE in soil, groundwater, and vapor originating from the Site

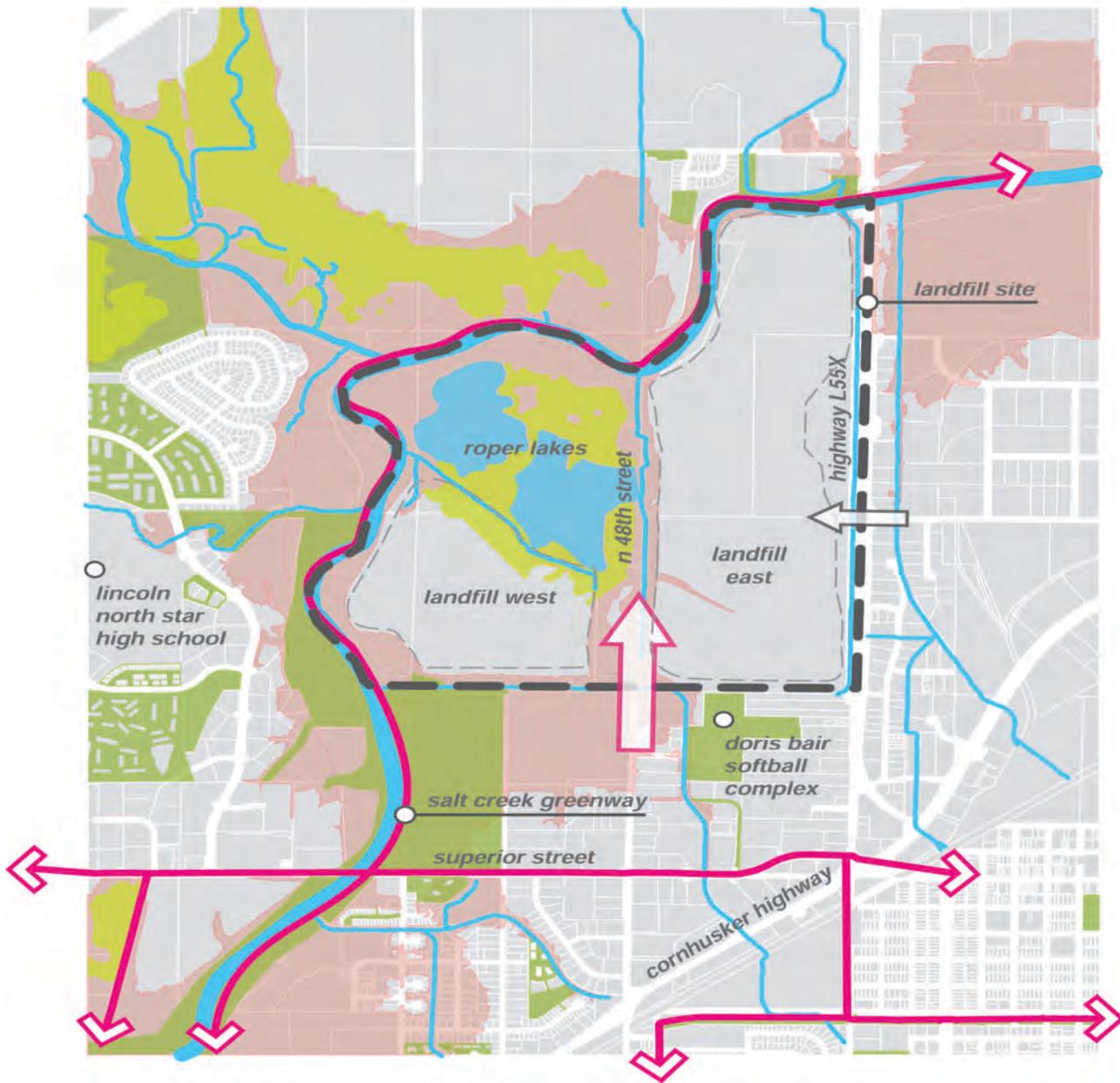
In support of the Remedial Action Objectives (RAO), one of the selected remedies includes monitoring of groundwater. The existing groundwater monitoring network consists of ten monitoring wells and sixteen piezometers. Monitoring wells are currently sampled semi-annually and the collected samples are analyzed for volatile organic compounds (VOCs) in accordance with the NDEQ-approved Remedial Action Plan (RAP). During each sampling event, static water level measurements are collected from each monitoring well, piezometer, Salt Creek and the Goodyear Ditch. Monitoring will continue at the Site until at least 2022 when the current 10-year monitoring period is completed. Additional monitoring may be required beyond 2022.

Landfill Gas System

Municipal solid wastes were disposed of at the North 48th Street Site from 1956 until 1990. Circa 1997, a field investigation was performed to assess the possible off-site impact and continued migration of landfill gas (LFG) outside of the Site boundaries. At that time, it was determined that LFG migration along the eastern boundary was not sufficient to cause a threat to public health or private property but that LFG migration along the southern boundary of Landfill East warranted controls. A passive LFG control system was constructed in late 1998 / early 1999 and is monitored by City personnel on a monthly basis.

Opportunities & Constraints

The following section provides a summary of the opportunities and constraints associated with the various resources on the Site. Opportunities are positive outcomes that can be realized for each resource. Constraints are special considerations and restrictions that are inherent to each resource.



- parks, open space & preserves
- ↔ existing & planned trails
- fema: 1% annual chance flood risk
- fema: minimal flood hazard
- streams & lakes
- saline wetlands
- ↔ primary vehicular access point
- ↔ secondary vehicular access point



*maps created with GIS data from the following sources:
USGS, USDA, NRCS, Lincoln/Lancaster Co. GIS, University of Nebraska-Lincoln GIS data

<i>Resources</i>	<i>Opportunities</i>	<i>Constraints</i>
<p>Trails/Recreation and Sustainability</p>	<ul style="list-style-type: none"> • Connect to the proposed city-wide Salt Valley Greenway which could run adjacent to Salt Creek on the west and north boundaries of the project site. This would provide access to the Site from around the City of Lincoln. • Existing natural resources could provide opportunities to integrate recreation (using Interior loop trails and boardwalks) to take advantage of views, wildlife observation/interaction, and wetland education opportunities. • Gentle slopes and land area allow for a wide open space and a range of recreational activities • Amenities to the Site as well as programming to bring out of town visitors to Lincoln will help to make the Site a tourist destination. Opportunities for parking, water and sewer should be pursued. • Based on an National Renewable Energy Laboratory study, landfills have excellent potential for future solar energy production. 	<ul style="list-style-type: none"> • Transition of allowing public access through the landfill facility while not interfering with landfill operations. • Wetland and slopes greater than 5% that occupy portions of the Site limit the more active recreational uses. • Primarily industrial land uses that surround the site limit comfortable connections from existing and future trails. • No crossing exists along Salt Creek that would provide direct access to regional trail and surrounding neighborhood/schools • Funding is limited; private dollars generated from interested recreational user groups and use fees (ie. bicycle pass) will be required. Additionally, lease agreements could also be used to fund improvements. • Balancing the desires of private groups and the public (the City) will require clear discussion and programming.
<p>Transportation</p>	<ul style="list-style-type: none"> • The North 48th Street corridor north of Superior Street is well marked and suitable for small vehicle traffic to access the Site. • Current site infrastructure north of the Goodyear Ditch and south of the Scale House could provide an access point for public access to the Site. • Potential public access could be gained at the North 56th Street and Fletcher Avenue gate. This gate is located in the eastern portion of the Site and currently has limited usage. 	<ul style="list-style-type: none"> • Ingress is primarily limited to the N 48th Street entrance located at the south property boundary. • Truck traffic is considerable and traffic flow to the Scale House must be maintained. • Access to the landfill disposal and customer convenience areas must be controlled during non-business hours.

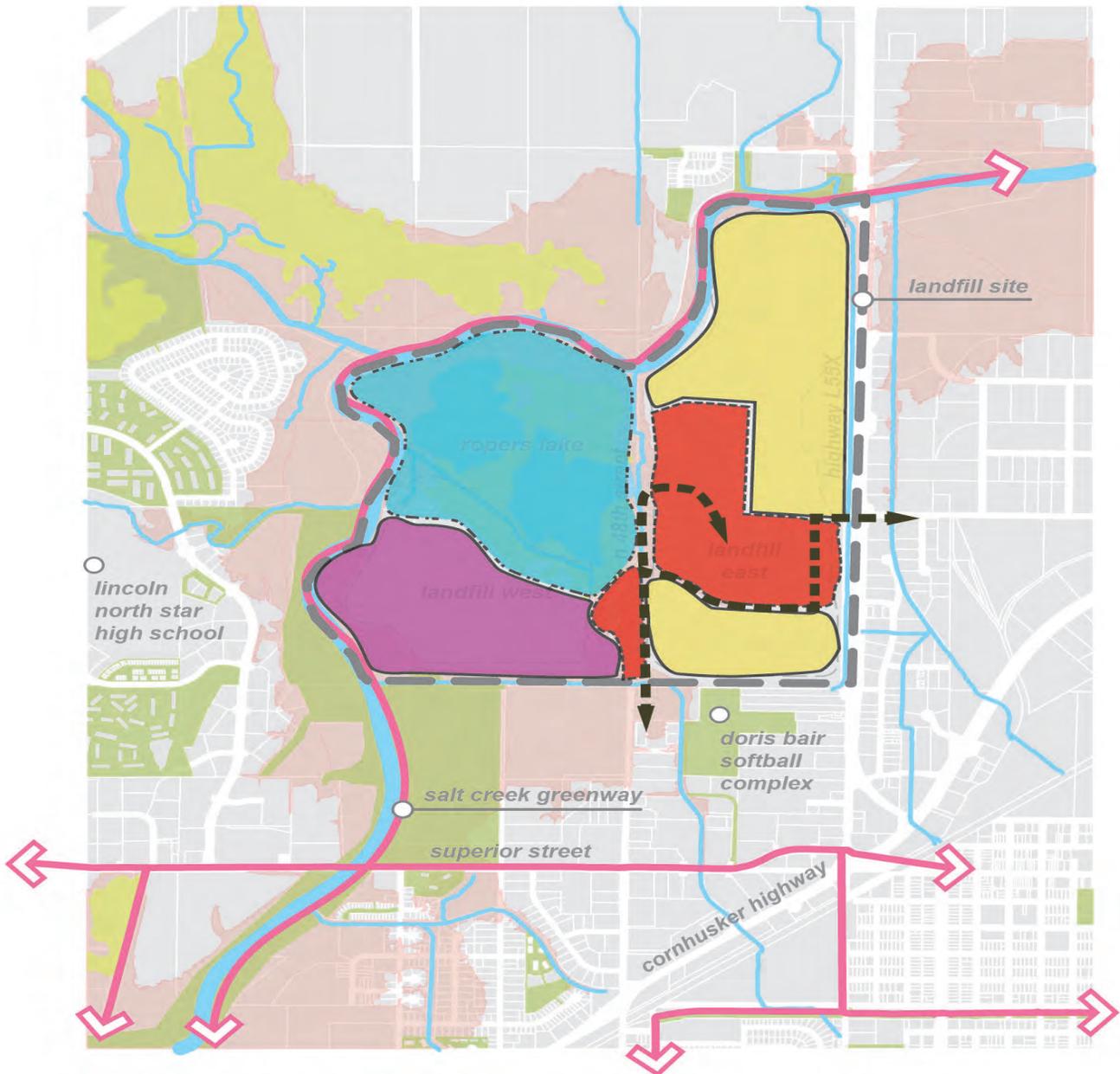
<i>Resources</i>	<i>Opportunities</i>	<i>Constraints</i>
Surface Water and Riparian Corridor	<ul style="list-style-type: none"> • Salt Creek has tremendous scenic value. • Opportunity to enhance scenic and habitat potential by restoring the banks with native vegetation. • Re-established historic stream channels could provide an opportunity to enhance the hydrology of Roper's Lake and the adjoining wetland. • Education/Interpretation – Tell the story of the watershed, rivers and Salt Creek as it relates to the local geology. Interpretive signage, overlooks, and feature markers. 	<ul style="list-style-type: none"> • This is a flood control channel so there will be strict controls on any channel modifications. • Steep banks limit stream access and could require significant engineering.
Remnant Saline Wetlands	<ul style="list-style-type: none"> • Direct on-site stormwater runoff to the wetlands provides hydrology and water treatment. • Goodyear Ditch and other drainage ditches could be redirected to the wetlands to enhance their hydrology. • Education/Interpretation – this Site provides an excellent opportunity to tell the story about the unique nature of saline wetlands, their role in the settlement of Lincoln and Lancaster County, history of impact and restoration. Can also tell the story of waterfowl management in relation to wetlands. 	<ul style="list-style-type: none"> • Potentially expensive and time intensive to restore wetlands. • Cannot directly reconnect the hydrology previously provided by Salt Creek. • Management of non-native and other invasive species present will be required in order to restore appropriate bottom-land species.

<i>Resources</i>	<i>Opportunities</i>	<i>Constraints</i>
<p>Bottomland Woodland</p>	<ul style="list-style-type: none"> Proximity to natural resources provides opportunity to use land management to enhance habitat value for amphibian, reptiles and small mammals. Increasing vegetative diversity will benefit the birds and other wildlife species using this area as well as attract other species. Education/Interpretation- Tell the story of the value of floodplains for flood control and their use for agricultural production (and urbanization). 	<ul style="list-style-type: none"> Local birders may have negative opinion regarding any land management strategy or re-vegetation that would diminish tree cover. Management of non-native and other invasive species will be required in order to restore appropriate bottom-land species
<p>Upland Areas</p>	<ul style="list-style-type: none"> Re-create areas of tallgrass prairie throughout the Site. The deep rooted native grasses will provide optimal soil stabilization while restoring a vanishing habitat. Diverse grasslands and tallgrass prairies provide habitat for a wide variety of plant and wildlife species which will in turn attract people who want to bird watch and explore nature. The native grassland could be used as a seed source for other City/NRD restoration projects. Education/Interpretation – Tell the story of the Tallgrass Prairie and its use by wildlife and humans 	<ul style="list-style-type: none"> Management of native grass may be restricted due to landfill regulations. This is in reference to using prescribed burning as a management tool.

<i>Resources</i>	<i>Opportunities</i>	<i>Constraints</i>
Closed Landfill Disposal Areas	<ul style="list-style-type: none"> Landfill West is easily accessible from the N 48th Street entrance and, in large part, has limited daily solid waste operations activity. This area of the property provides good access to Roper Lakes located on the northwest portion of the Site. The north half of Landfill East is at final grade and offers a point of access to the Roper Lakes area as well as opportunity for public access and use from the N 56th Street and Fletcher Avenue entrance. 	<ul style="list-style-type: none"> Continued maintenance of the final cover systems will continue for decades into the future. Differential settlement will necessitate additional soils placement to maintain proper grades and stormwater management. Landfill West has not yet been closed to final grade. Future soil cover projects are planned thereby limiting development potential. Structures on the landfill cover will be limited and/or will require significant geotechnical engineering and environmental controls
Active Landfill Disposal Areas	<ul style="list-style-type: none"> Observation points adjacent to disposal areas may provide for public education opportunities. 	<ul style="list-style-type: none"> Public and unauthorized access to the active landfill areas must be prevented using artificial and natural barriers. Access to the active landfill areas must be preserved to allow for the safe and efficient use and operation of the disposal area.
Customer Convenience Areas	<ul style="list-style-type: none"> Site infrastructure is in place and possible expansion of community services (i.e. household hazardous waste facility) could be realized. 	<ul style="list-style-type: none"> Public and unauthorized access to the customer convenience areas must be prevented using artificial and natural barriers. Access to the customer convenience areas must be preserved to allow for the safe and efficient use and operation of the small vehicle drop off area, recycling areas, composting and brush areas, appliance de-manufacturing area, and site maintenance building.

<i>Resources</i>	<i>Opportunities</i>	<i>Constraints</i>
Groundwater Monitoring System	<ul style="list-style-type: none"> Environmental awareness and education opportunities can be realized. 	<ul style="list-style-type: none"> Groundwater contamination exists at the site. Groundwater cannot be used for human consumption, irrigation, or any other purposes. A groundwater monitoring network, consisting of ten monitoring wells and sixteen piezometers must be maintained at the Site and protected from public access and vandalism.
Landfill Gas System	<ul style="list-style-type: none"> Observation points adjacent to disposal areas may provide for public education opportunities. 	<ul style="list-style-type: none"> Public and unauthorized access to the active landfill areas must be prevented using artificial and natural barriers. Access to the active landfill areas must be preserved to allow for the safe and efficient use and operation of the disposal area.

Usage opportunities based on existing and planned land use are indicated below.



- roadway system for active landfill (must remain)
- no immediate use area (active C&D fill and transfer station)
- available for immediate and continued use
- available for immediate use with limitations for future capping projects
- available for immediate use with limitations related to saline wetlands



*maps created with GIS data from the following sources:
 USGS, USDA, NRCS, Lincoln/Lancaster Co. GIS, University of Nebraska-Lincoln GIS data

usage opportunity map

