# APPENDICES

Appendix A - Administrative Commitments and Right-of-Way Inventory

- Appendix B Existing Conditions Mapping
- Appendix C Wetlands Study
- Appendix D Facility Diagrams

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The NPS has made every effort to ensure that the information in this appendix document to the Facility Revitalization Plan is accessible. However, the appendix is not fully compliant with Section 508. If readers are in need of 508 compliance for this document, please contact 701-623-4466 if they would like to receive a 508 compliant PDF of the appendix.

# APPENDIX A Administrative commitments & right-ofway inventory

#### **APPENDIX A**

#### Administrative Commitments

Name	Agreement Type	Start Date	Expiration Date	Stakeholders	Purpose	Notes
Road Clearance – East River Road	Encumbrance	Unknown	Unknown	Town of Medora and landowners adjacent to park	The National Park Service is required to maintain and clear the snow from the East River Road, from the Medora entrance to the north boundary of the South Unit, for use by ranchers living adjacent to the park	This encumbrance was drawn from the 1992 Statement for Management, no other reference was given
Trail Rides	Concession Contract	1/1/09	12/31/18	Shadow Country Outfitters	To provide trail rides for park visitors in the South Unit during the summer season	A horse riding contract has been in existence since at least the 1960s
Cooperating Association	Commercial use authorization	10/1/12	9/3/14	Theodore Roosevelt Nature and History Association	To sell limited convenience items for visitors in three park visitor centers	Changed from Concessions Permit in past
Cooperating Association	Cooperating association agreement	10/18/10	10/17/15	Theodore Roosevelt Nature and History Association	To provide support for interpretation, education and research	Since 1951
Friends Group	Partnership agreement	7/25/11	Indefinite	Friends of Theodore Roosevelt National Park	Raise public awareness, engage youth; promote park mission and Theodore Roosevelt legacy	Current agreement
Information and Education	Memo of understanding	7/27/11	Indefinite	Theodore Roosevelt	Dickinson State University kiosk,	Current Agreement

Theodore Roosevelt National Park

				Center – Dickinson State University	digitization, symposia	
Mutual Assistance	Memo of Understanding	2/13/13	2/13/16	State Historical Society of North Dakota and three North Dakota national parks	Mutual aid and assistance on matters relating to history and historic sites	Current Agreement
Mutual Aid	Memo of Understanding	8/9/13	8/9/18	Billings County Sheriff's Department	To provide mutual aid for law enforcement and other incidents	Current Agreement
Mutual Aid	Memo of Understanding	7/15/13	7/15/18	McKenzie County Sheriff's Department	To provide mutual aid for law enforcement and other incidents	Current Agreement
Medical Control/ Director	Memo of Understanding	2/26/13	2/26/18	St. Joseph's Hospital	To provide medical control for park emergency medical technicians	Current Agreement
Radio Services	Special Use Permit	8/9/04	8/8/14	U.S. Forest Service	To share radio repeater tower	
Cooperating Agency Status	Memo of Understanding	6/22/11	12/31/15	U.S. Forest Service – Dakota Prairie Grasslands	Proposed gravel pit development near Elkhorn Ranch	Current Agreement
Scenic Byway Designation	Designation	2000	Indefinite	North Dakota Department of Transportatio n and Parks and Recreation Department	To designate the North Unit Scenic Drive as a state scenic byway	
Mutual Aid	Interagency Agreement	4/22/96	Indefinite	U.S. Fish and Wildlife Service	To provide mutual assistance for law enforcement	

					indidents and other needs	
Mutual Aid	Interagency Agreement	4/5/94	Indefinite	U.S. Forest Service/ Department of the Interior	To provide mutual assistance for law enforcement incidents and other needs	Nationwide Agreement
Fire Assistance	General Agreement	August 2008	Expired in 2011 but awaiting approval of new agreement	Billings County	To provide mutual assistance on wildland fires	
Fire Assistance	General Agreement	August 2008	Expired in 2011 but awaiting approval of new agreement	McKenzie County	To provide mutual assistance on wildland fires	
Fire Assistance	Memo of Understanding	Indefinite	Updated Annually	Federal Agencies	To provide mutual assistance on wildland fires	
NPS Affiliated Area	Unknown	Unknown	Indefinite	International Peace Garden	To provide planning assistance and financial pass- through	
Native Seed Services	Interagency Agreement	6/2013	3/15/2015	U.S. Department of Agriculture – Plan Materials Center	Reimbursement through Federal Highway Administration for propagation of native seed for vegetation restoration	
Interpretive Services	Medora City Council Decision	1998	Indefinite	City of Medora and Medora Chamber of Commerce	To provide bulletin board spaces for Medora activities and information at Painted Canyon	
Trail Management	Memo of Understanding	4/14/11	13/31/15	North Dakota Department	Cooperation in operation,	Current Agreement

River Gauging Station	Agreement	9/11/89	Indefinite	of Parks and Recreation/ U.S. Forest Service U.S. Geological Survey	maintenance and promotion of Maah Daah Hey Trail To maintain small building to house streamflow monitoring equipment in the North Unit
Weather Observation	Co-op agreement	4/6/72	Indefinite	National Weather Service	To record official weather observations – South Unit
Weather Observation	Co-op agreement	4/6/72	Indefinite	National Weather Service	To record official weather observations – North Unit
Adopt-A Highway	Adopt-a- highway agreement	4/15/11	4/15/14	North Dakota Department of Transportatio n	To provide highway cleanup services twice per year
Wildlife Transfer	Memo of Understanding	9/2013	9/2018	Intertribal Buffalo Council	To provide excess live bison to Tribes
Wildlife Transfer	Memo of Understanding	In Progress	9/30/19	Dakota Zoo	To provide excess live bison to zoo
Wildlife Transfer	Memo of Understanding	In progress	9/30/19	North Dakota Buffalo Association	To provide excess live bison to preserve

#### **Right-of-Way Inventory**

Location	Use	Permittee	Permit Number	Start Date	End Date	Permit Type	Notes
North Unit	Telephone Line	Northwestern Bell Telephone	SP1540- 83-01	8/1/83	7/31/13	Special Use Permit	Northwestern Bell was bought out by Reservation Telephone Cooperative.
South Unit	Transportation	Interstate 94, U.S. Department of Transportation	Unknown	None	None	Right- of-Way	I-94 was completed in 1969. I-94 was mostly built along or on top of the old U.S. 10 alignment. Therefore, a right-of-way was done for either old U.S. 10 or I-94.
North Unit	Electric Power Line	Western Area Power Administration	Unknown	None	None	Right- of-Way	Permanent right-of-way/ easement granted prior to the establishment of Theodore Roosevelt National Park.
South Unit	Water Pipeline	The State Historical Society of North Dakota	RW- 1540-00- 001	5/1/00	5/1/10	Right- of-Way	Replacement of existing water line.
South Unit	Water Pipeline	Southwest Water Authority	RW- 1540-04- 001	4/1/04	4/1/14	Right- of-Way	Waterline for Painted Canyon Visitor Center, in the process of renewing right-of-way.
North Unit	Electric Power Line	McKenzie Electrical Cooperative Inc.	RW- 1540-03- 001	9/1/03	9/1/13	Right- of-Way	Powerline for the North Unit.

Theodore Roosevelt National Park - 16 -

South Unit	Micro Cell Site(s) Telephone	Verizon Wireless Reservation	RW- 1540-07- 001 SP 6780-	5/1/08	6/1/03	Right- of-Way Special	Wireless telecommunica tion facility within park boundary. The annual fee of \$4,868 is active. Right-of-way
	Line	Telephone Cooperative	4-0002			Use Permit	request and repair/ replacement of existing lines.
North Unit	Transportation	North Dakota Department of Transportation	MWR- THRO- 6000- 2011-012	6/1/11	2/1/15	Special Use Permit	Modification to North Dakota Highway 85, landslide repair required an addition to the existing right- of-way.
South Unit	Electric Power Line	West Plains Electrical Cooperative Inc.	RW- 1540-04- 001	9/1/04	9/1/14	Right- of-Way	Power source to the South Unit entrance station, will need to be renewed in 2014.
South Unit	Telephone Line	Midstate Telephone Company	SP 6780- 4-0002	6/1/03	6/1/13	Right- of-Way	Renewal of right-of-way.
South Unit	Electric Power Line	Roughrider Electric Cooperative, Inc.	RW 1540-08- 01	6/1/08	6/1/18	Right- of-Way	Ability to replace and maintain a 28- foot section of line.
South Unit	Infrastructure	Theodore Roosevelt Medora Foundation	RW- 1540-08- 02	6/1/08	6/1/18	Right- of-Way	Modification of an existing drainage ditch.

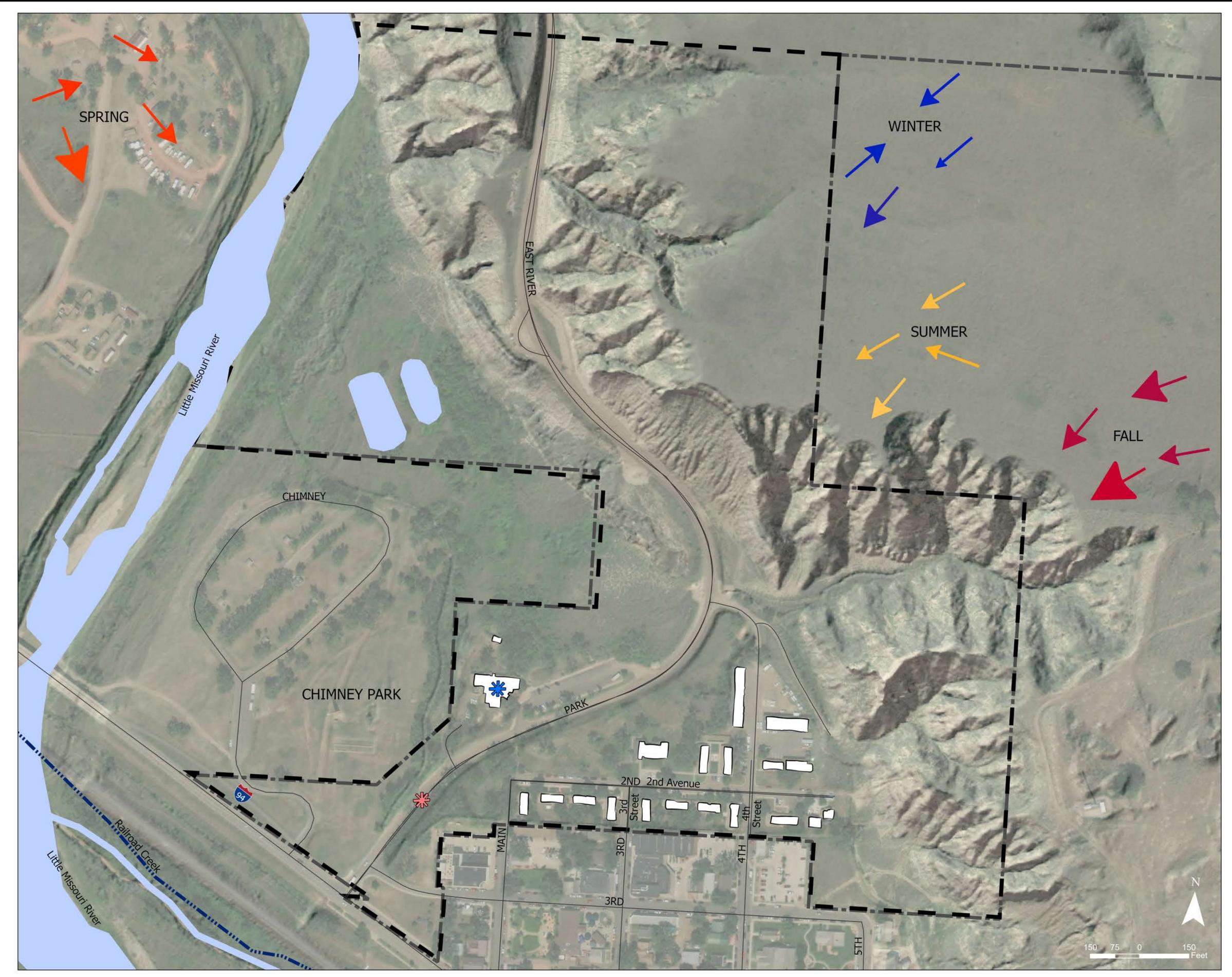
# APPENDIX B EXISTING CONDITIONS MAPS

#### **APPENDIX B**

#### **Existing Conditions Mapping**

South Unit - Medora Area Base Map Base Map Enlargement Ecosystems Geology Land Use Slope Soil Quality for Development Solar Potential South Unit - Painted Canyon Base Map Slope South Unit - Peaceful Valley Base Map Elkhorn Ranch Base Map North Unit – Entry and Housing/ Maintenance Areas Base Map Base Map Enlargement #1 Base Map Enlargement #2 Ecosystems Geology Land Use Slope Soil Quality for Development Solar Potential Viewshed

# HQ Area **Existing Conditions: Project Area Overview**





# **Comprehensive Site Plan and Environmental Assessment** THRO 258662

# Legend

# Prevailing Winds - Seasonal AWND (Average Wind Speed)

→ 10

# TAVG (Average Temperature)

-0.8



69.1

## NPS Visitor Facilities



Visitor Center Entry Station

# NPS Buildings

NPS Buildings

## Roads

# Hydrology

Intermittent

Rivers, Streams & Wetlands

# Boundaries



Study Area Boundary

THRO Administrative Boundary

# HQ Area **Existing Conditions: Zoom In**





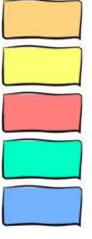
# **Comprehensive Site Plan and Environmental Assessment** THRO 258662

# Legend

## NPS Visitor Facilities

Visitor Center Entry Station

# **Building Primary Function**



Housing (4-Plex)

Housing (Single Family)

Operations

Operations (Office)

Visitor Services

# Roads

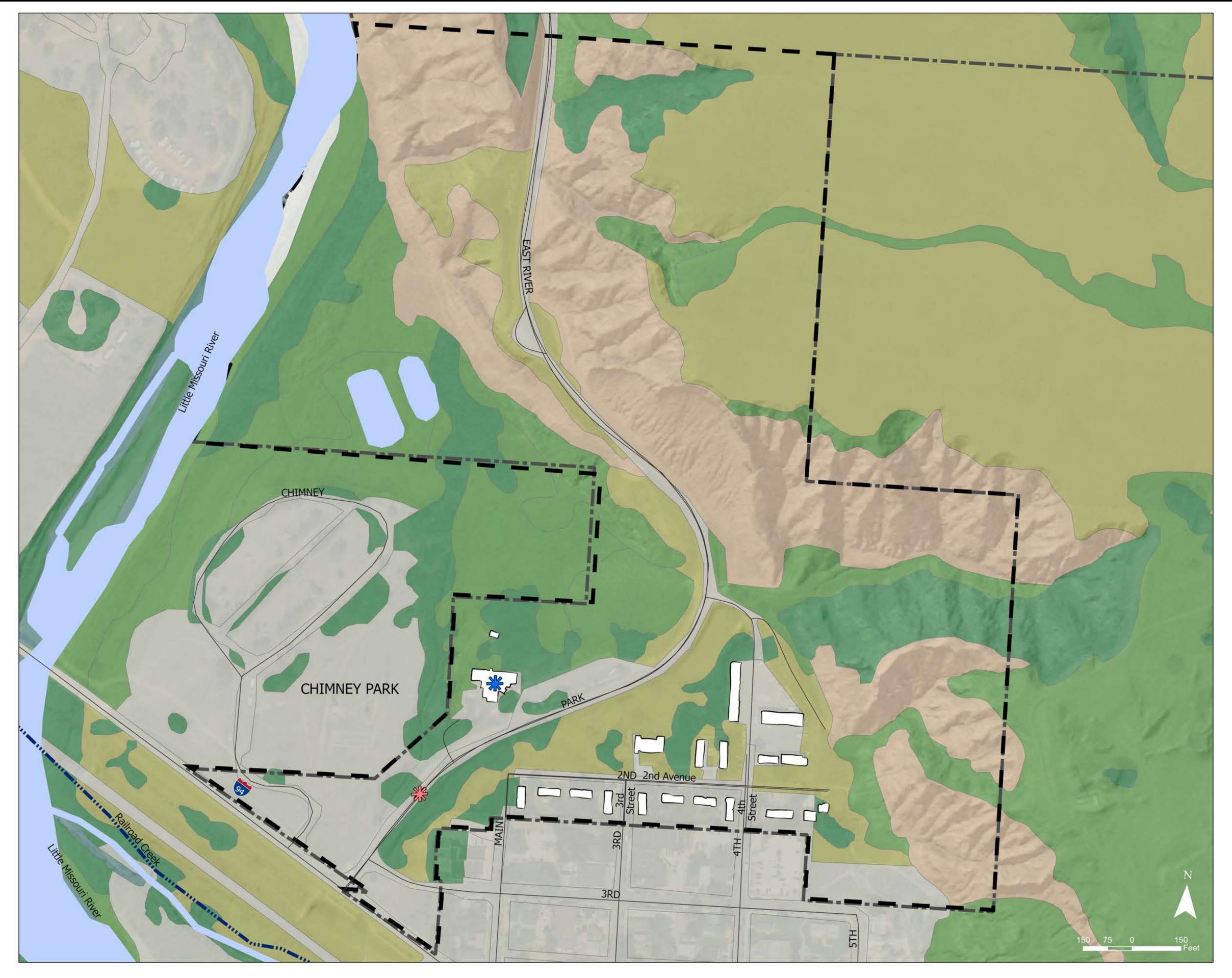
# Hydrology

- ----- Intermittent
  - Rivers, Streams & Wetlands
  - Artificial Wetlands
- Wetland Polygons
- **Riverine Habitat**
- Artificial Watercourse
- Estimated Streams
- Stream Lines

## Boundaries

Study Area Boundary THRO Administrative Boundary

# HQ Area **Existing Conditions: Ecosystems**





# **Comprehensive Site Plan and** Environmental Assessment THRO 258662

# Legend

## NPS Visitor Facilities



Visitor Center Entry Station

## NPS Buildings

NPS Buildings

Roads

# Hydrology

Intermittent

Rivers, Streams & Wetlands

## Boundaries

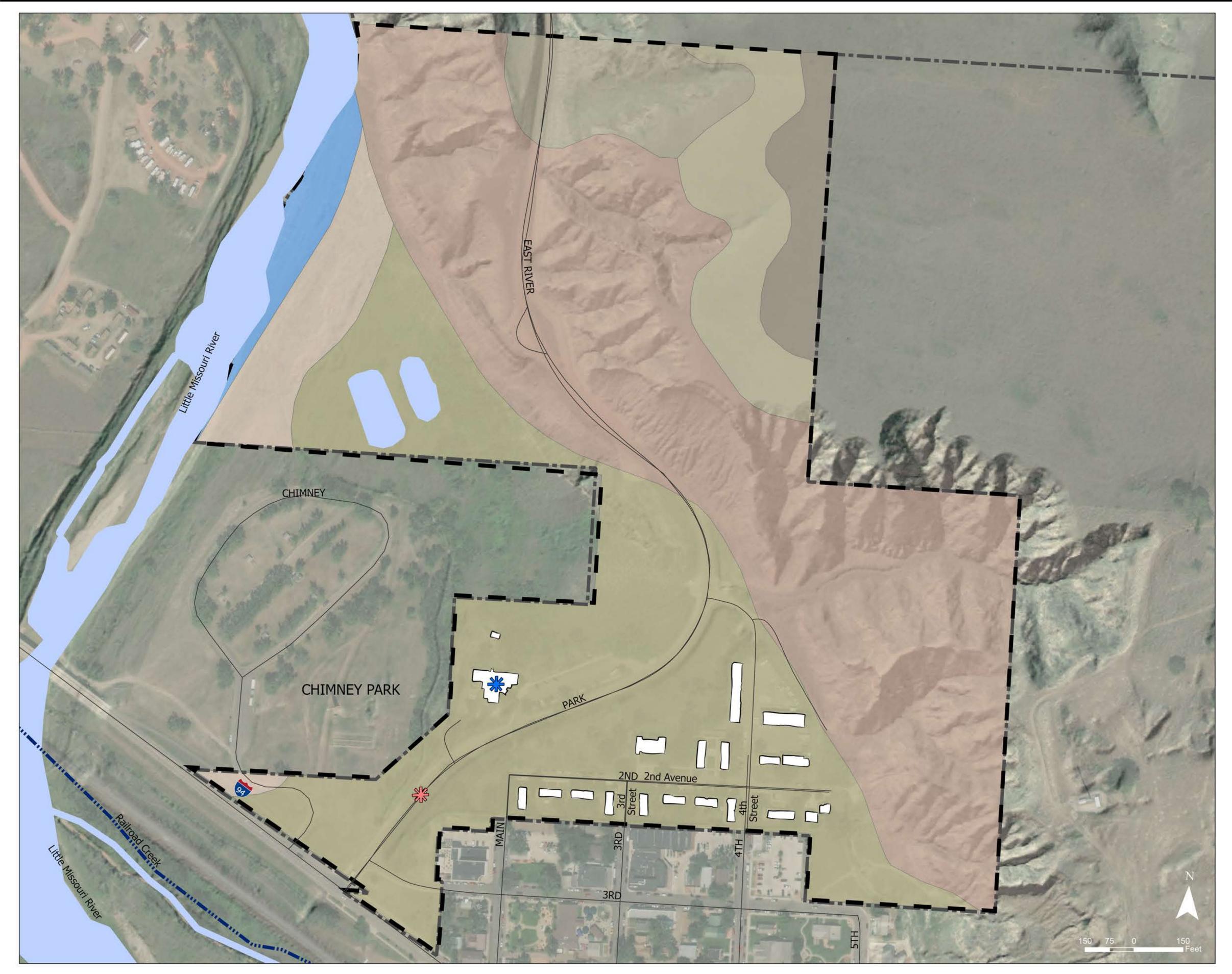
Study Area Boundary

THRO Administrative Boundary

# Vegetation Mapping (1996)

- Agriculture Area
- Developed Area
- Forbland
- Grassland
- **Invasive Species Infestation**
- Other/Unknown (See Other Notes)
- Shrubland
- Sparse Vegetation
- Water
- Wetland
- Woodland

# HQ Area **Existing Conditions: Geology**





# **Comprehensive Site Plan and** Environmental Assessment THRO 258662

# Legend

NPS Visitor Facilities



Visitor Center Entry Station

# Roads

# Hydrology

Intermittent

Rivers, Streams & Wetlands

## Boundaries

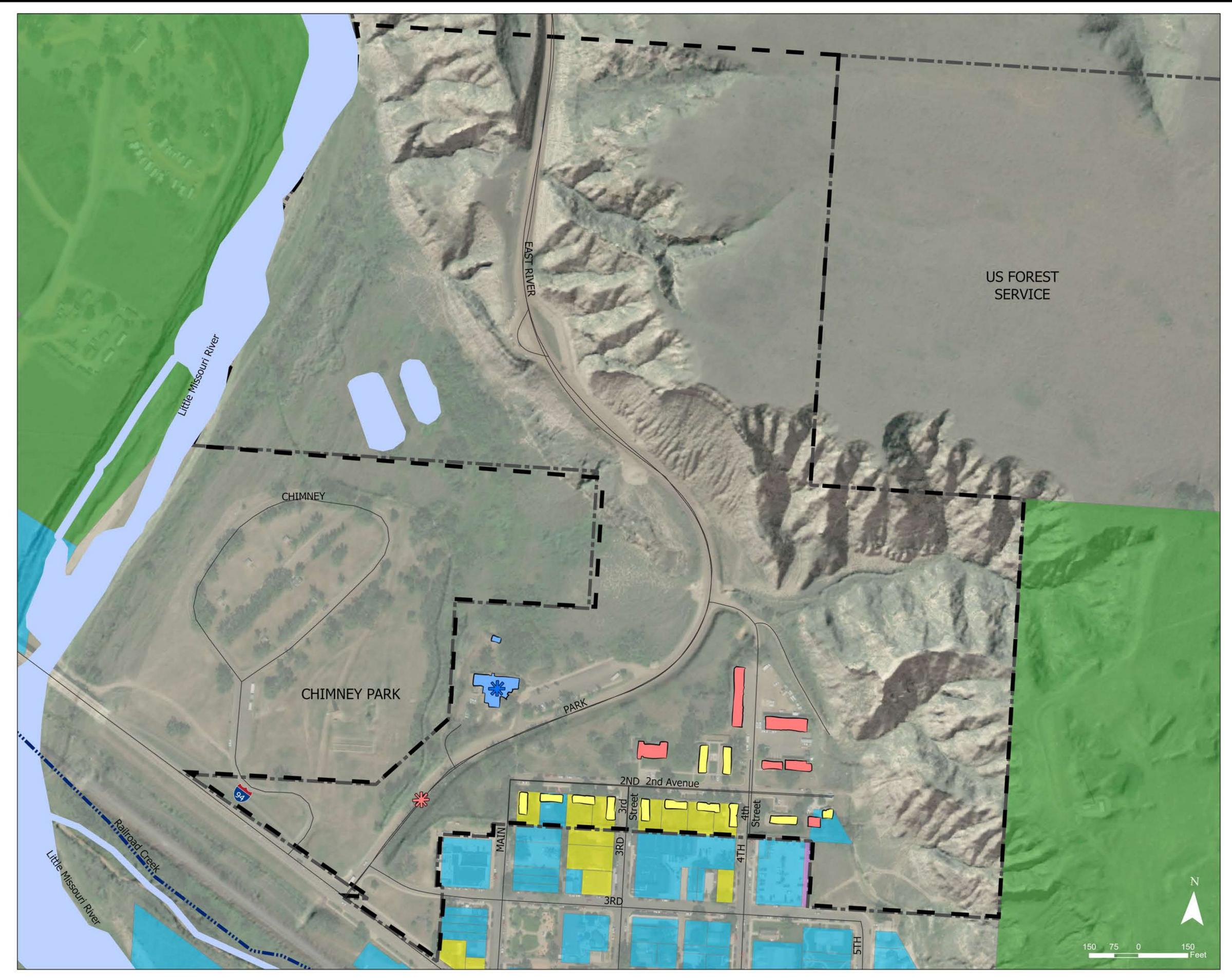
- Study Area Boundary
- THRO Administrative Boundary

# NPS Buildings

NPS Buildings

# Study Area Soils

Badland, 9 to 150 percent slopes Badland-Arikara-Cabbart complex, 15 to 70 percent slopes Cabbart-Badland complex, 6 to 70 percent slopes Cabbart-Kremlin-Boxwell loams, 9 to 40 percent slopes, slumped Hanly fine sandy loam, 0 to 6 percent slopes, occasionally flooded Havre silt loam, 0 to 2 percent slopes, occasionally flooded Littlemo-Chanta complex, 0 to 2 percent slopes Patent loam, 0 to 6 percent slopes, occasionally flooded Patent-Badland-Cabbart complex, 6 to 50 percent slopes Tinsley-Chanta complex, 6 to 35 percent slopes Water



# HQ Area **Existing Conditions: Land Use**



# **Comprehensive Site Plan and** Environmental Assessment THRO 258662

# Legend

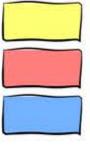
## NPS Visitor Facilities



Visitor Center

Entry Station

# NPS Building Primary Function



Operations

Housing

Visitor Services

## Roads

# Hydrology

----- Intermittent

Rivers, Streams & Wetlands

## Boundaries

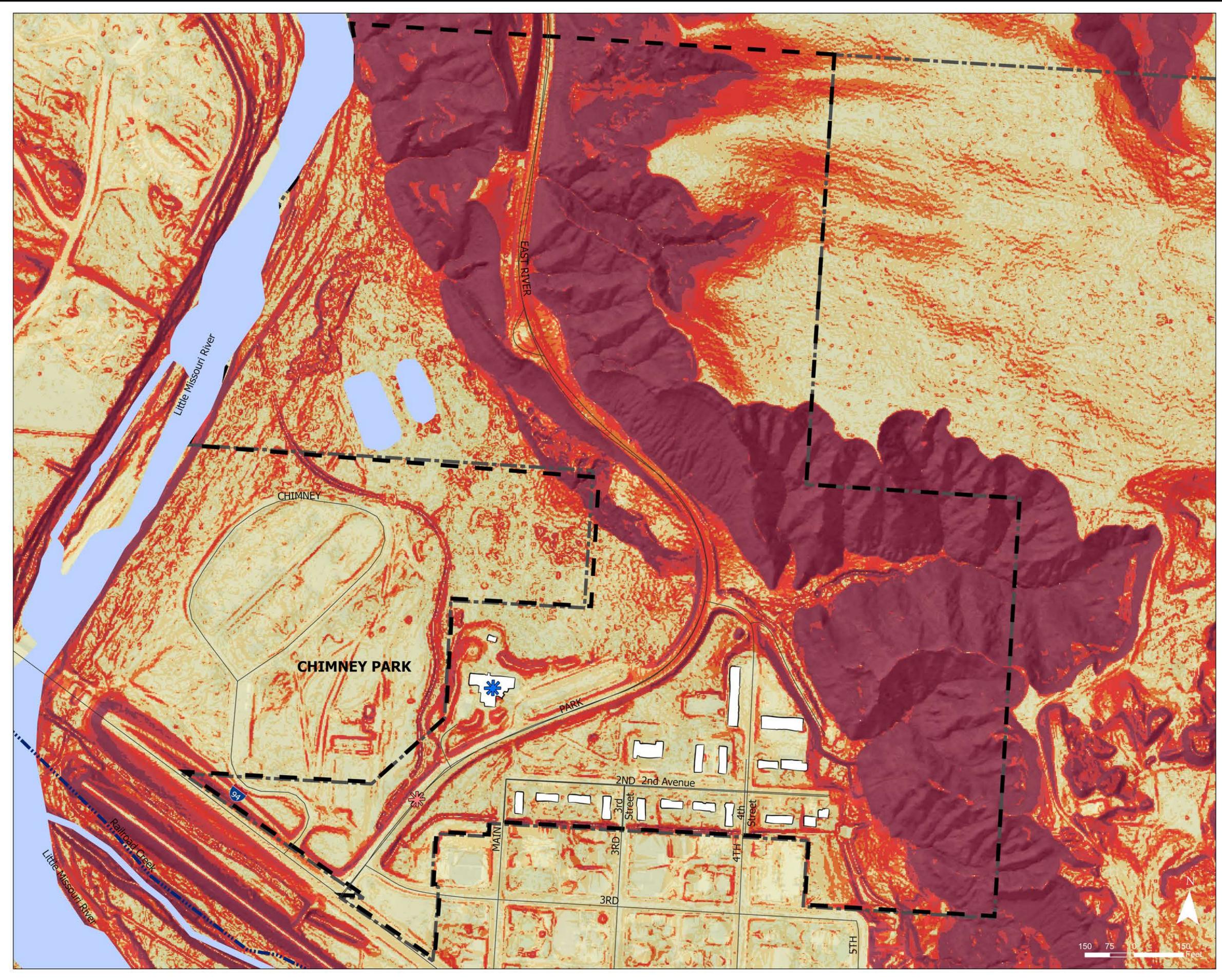
- Study Area Boundary
- THRO Administrative Boundary

## Parcels

Unknown

- Commercial
- Farm
- **RIVER BOTTOM**
- RIVER BOTTOM EXEMPT
- Residential

# HQ Area **Existing Conditions: Slope Analysis**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

### NPS Visitor Facilities



Visitor Center

Entry Station

# NPS Buildings

NPS Buildings

Roads

# Hydrology

----- Intermittent

Rivers, Streams & Wetlands

## Boundaries



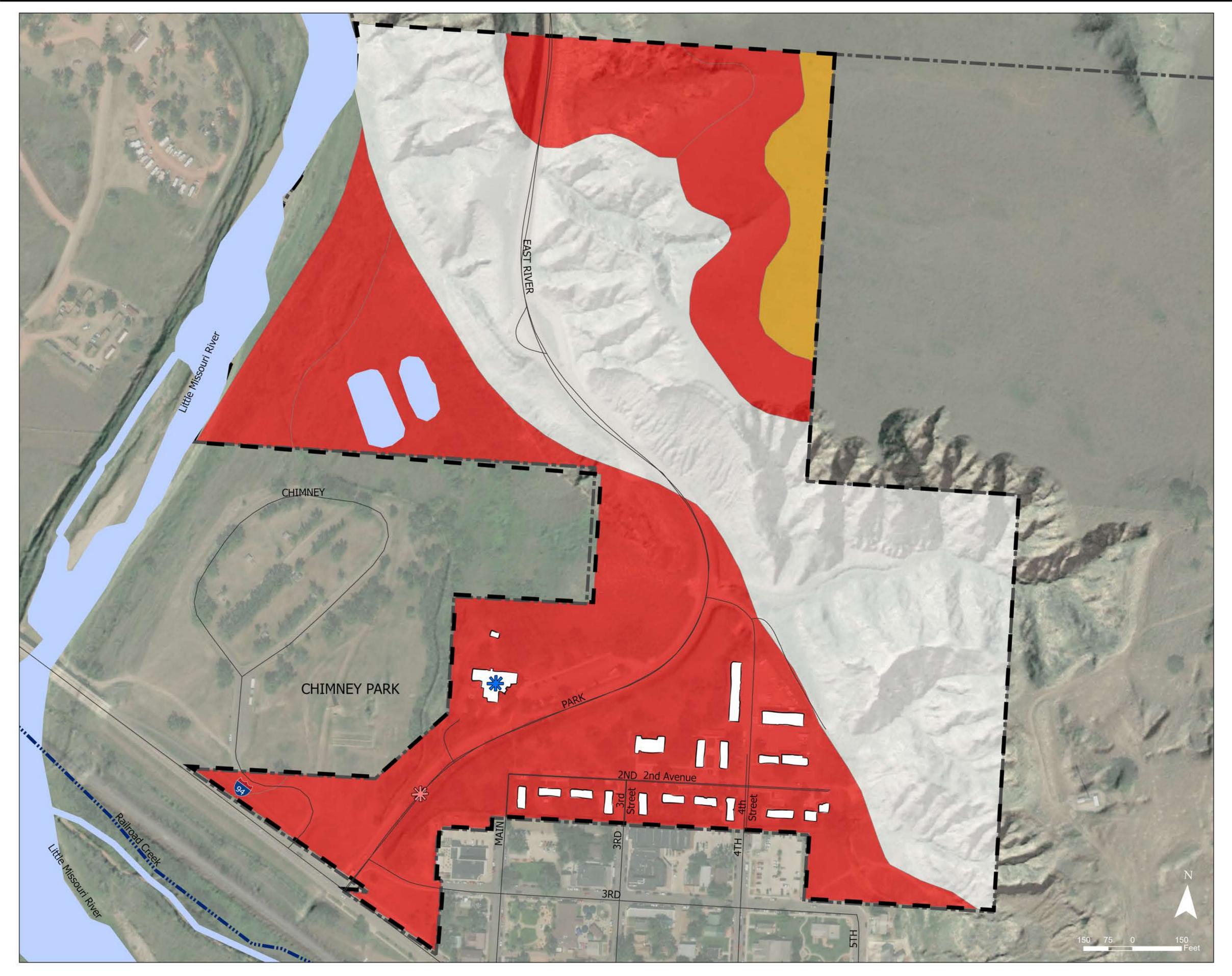
Study Area Boundary

THRO Administrative Boundary

## Slope Analysis

- 0-2% 2-5%
- 5-8%
- 8-15%
- 15-25%
- 25%+

# HQ Area **Existing Conditions: Soil Quality for Development**

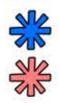




# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

NPS Visitor Facilities



Visitor Center Entry Station

Roads

# Hydrology

Intermittent

Rivers, Streams & Wetlands

## Boundaries



Study Area Boundary

THRO Administrative Boundary

# NPS Buildings

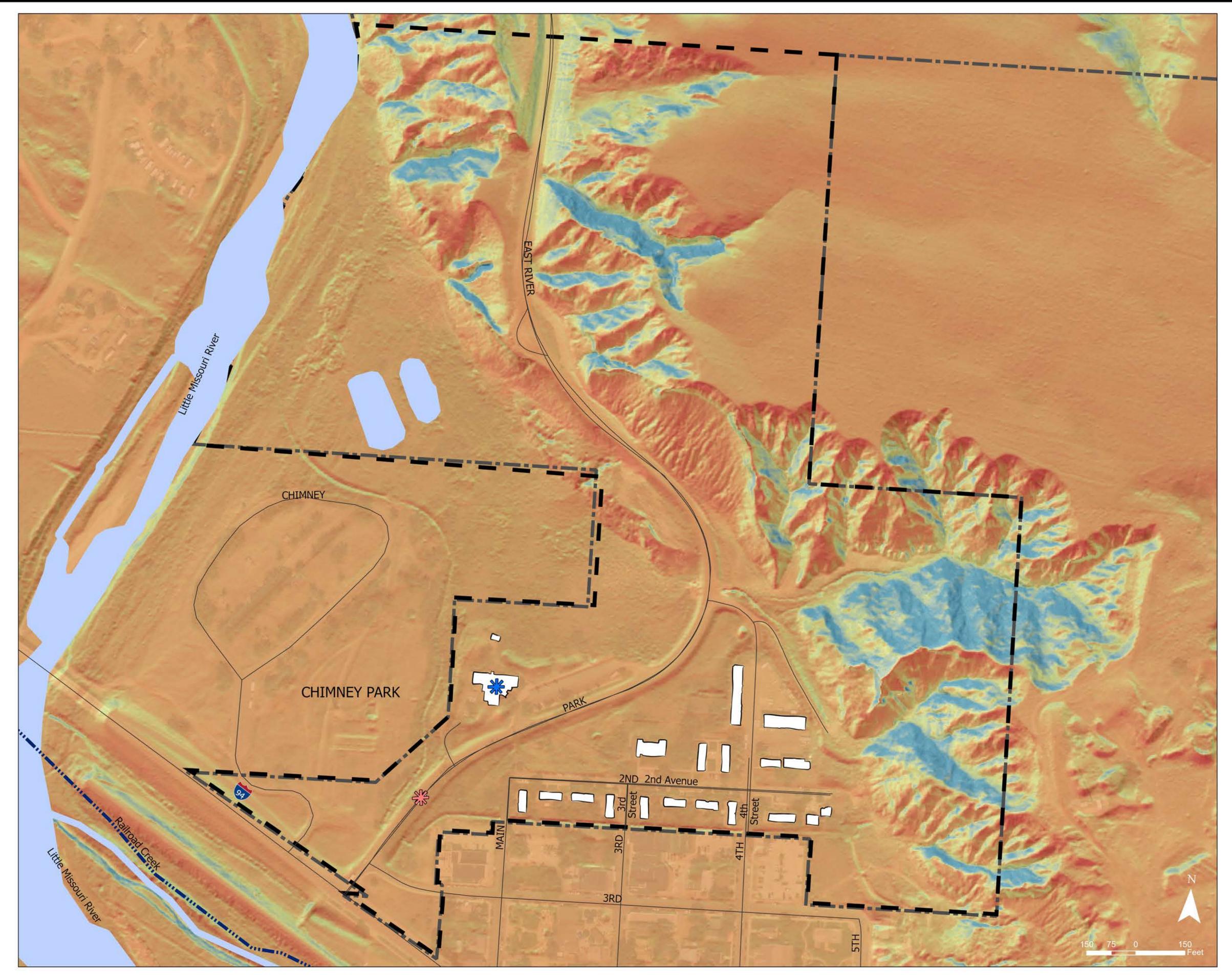
NPS Buildings

# Soil Quality for Development

Not Rated Somewhat Limited

Very Limited

# HQ Area **Existing Conditions: Solar Potential**

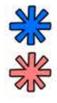




# **Comprehensive Site Plan and** Environmental Assessment THRO 258662

# Legend

## NPS Visitor Facilities



Visitor Center



## NPS Buildings

NPS Buildings

Roads

# Hydrology

Intermittent

Rivers, Streams & Wetlands

### Boundaries

- Study Area Boundary

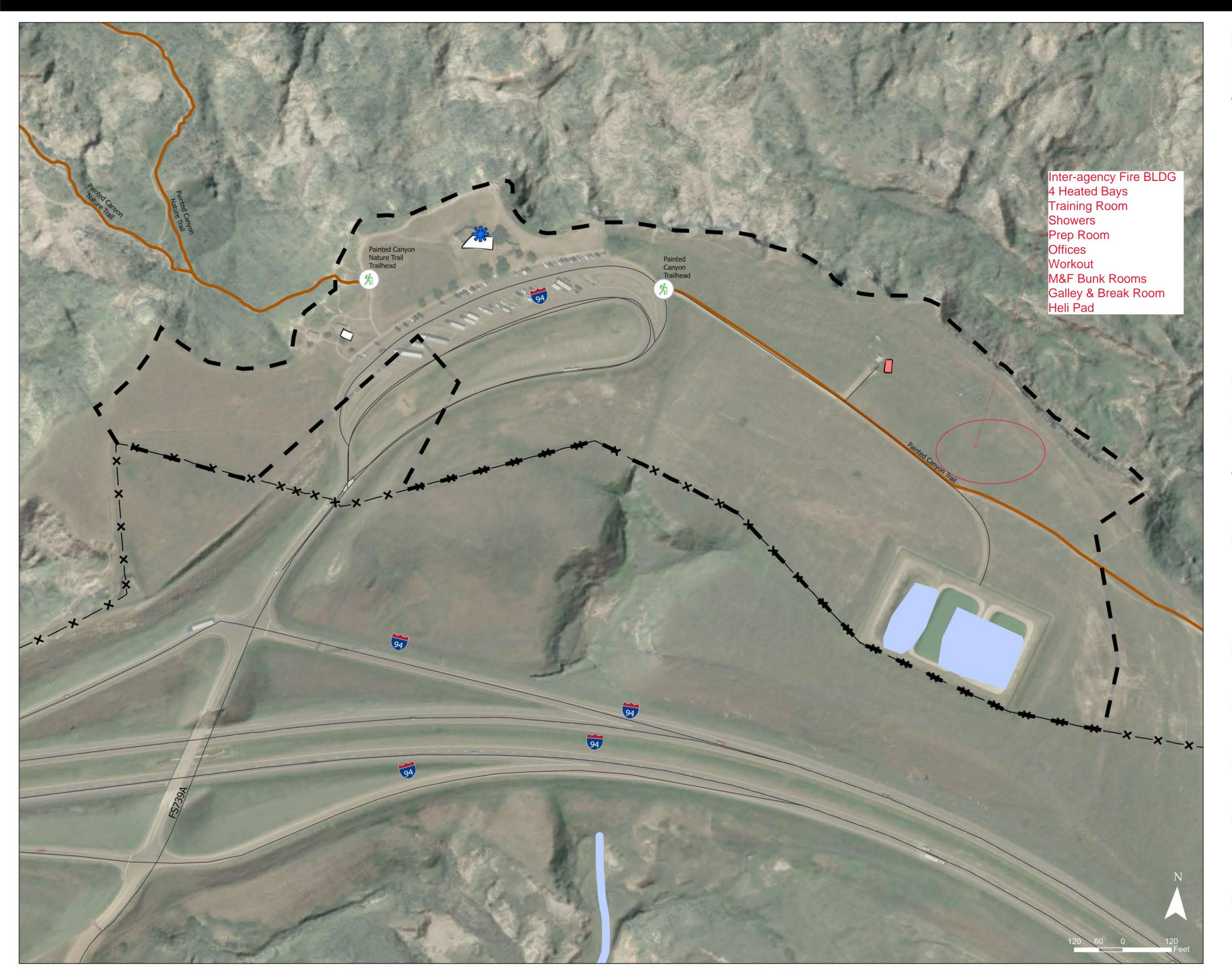
THRO Administrative Boundary

# Solar Radiation Potential

Highest Solar Potential

Lowest Solar Potential

# **Painted Canyon Existing Conditions: Project Area Overview**





# **Comprehensive Site Plan and Environmental Assessment** THRO 258662

# Legend

# NPS Visitor Facilities



Visitor Center

## Trailheads

## Fence

-x-

# NPS Building Primary Function

Operations

# NPS Buildings

NPS Buildings

Roads

# Non-Motorized Trail

# Hydrology

Intermittent

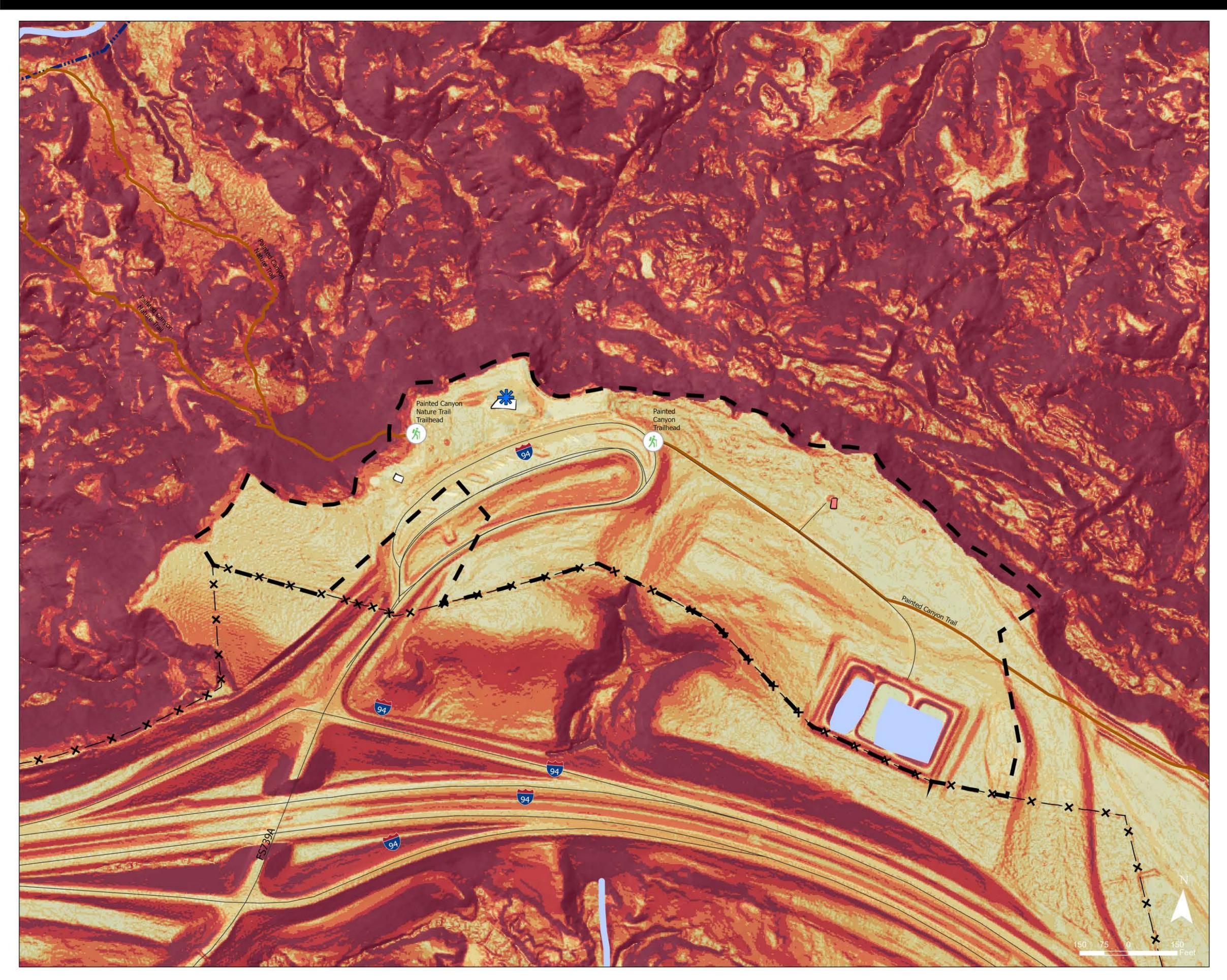
Rivers, Streams and Wetlands

# Boundaries

Study Area Boundary

THRO Administrative Boundary

# **Painted Canyon Existing Conditions: Slope Analysis**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

# NPS Visitor Facilities



Visitor Center

## Trailheads



### Fence

-x-

# NPS Building Primary Function

Operations

## NPS Buildings



Roads

# Non-Motorized Trail

# Hydrology

Intermittent

Rivers, Streams and Wetlands

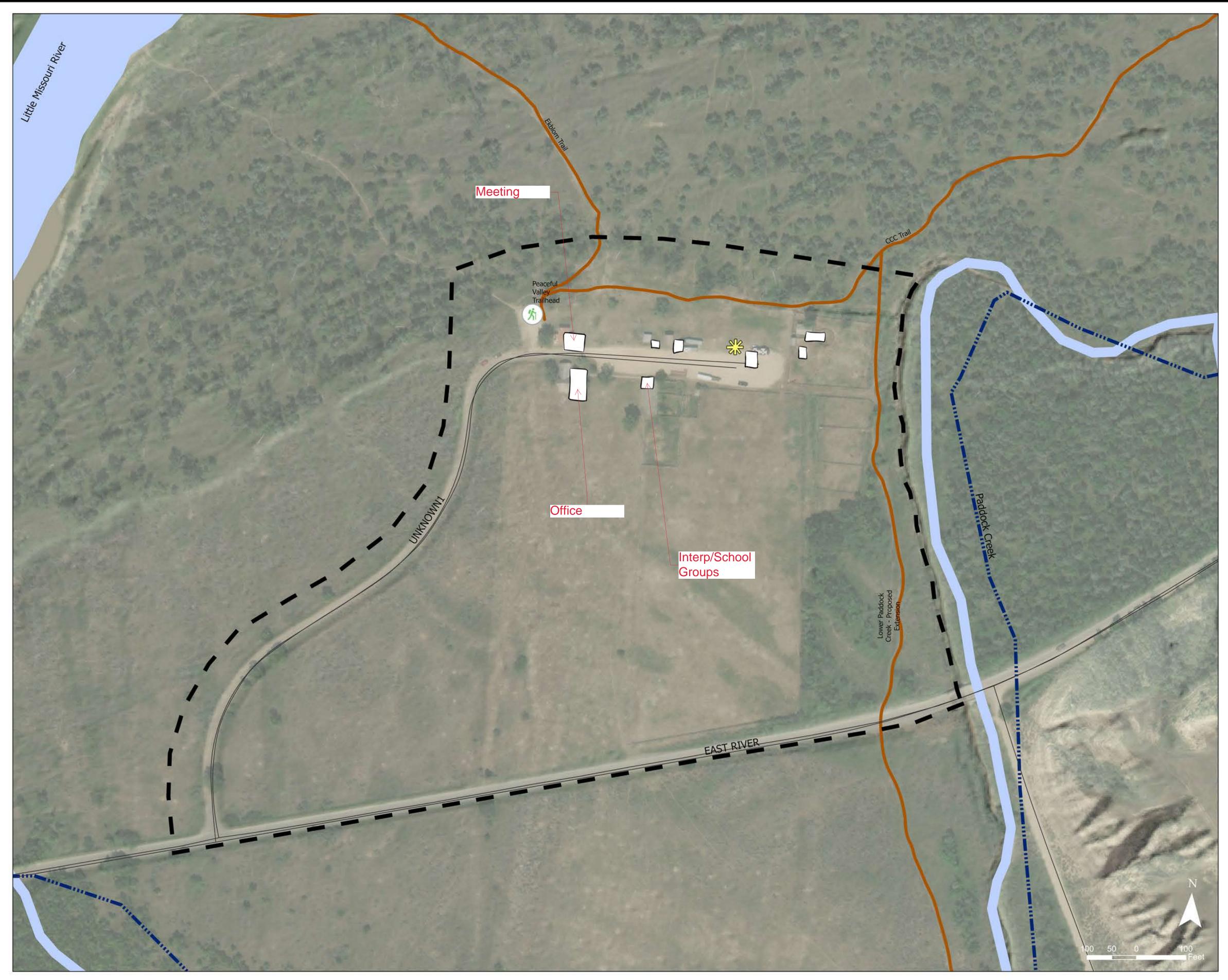
# Slope

- 0-2%
- 2-5%
- 5-8%
- 8-15%
- 15-25%
- 25%+

# Boundaries

- Study Area Boundary
- THRO Administrative Boundary

# Peaceful Valley **Existing Conditions: Project Area Overview**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

# **NPS Visitor Facilities**

Restroom

## Trailheads

(1)

## NPS Buildings

NPS Buildings

# Roads

# Hydrology

----- Intermittent

Rivers, Streams and Wetlands

# Non-Motorized Trails

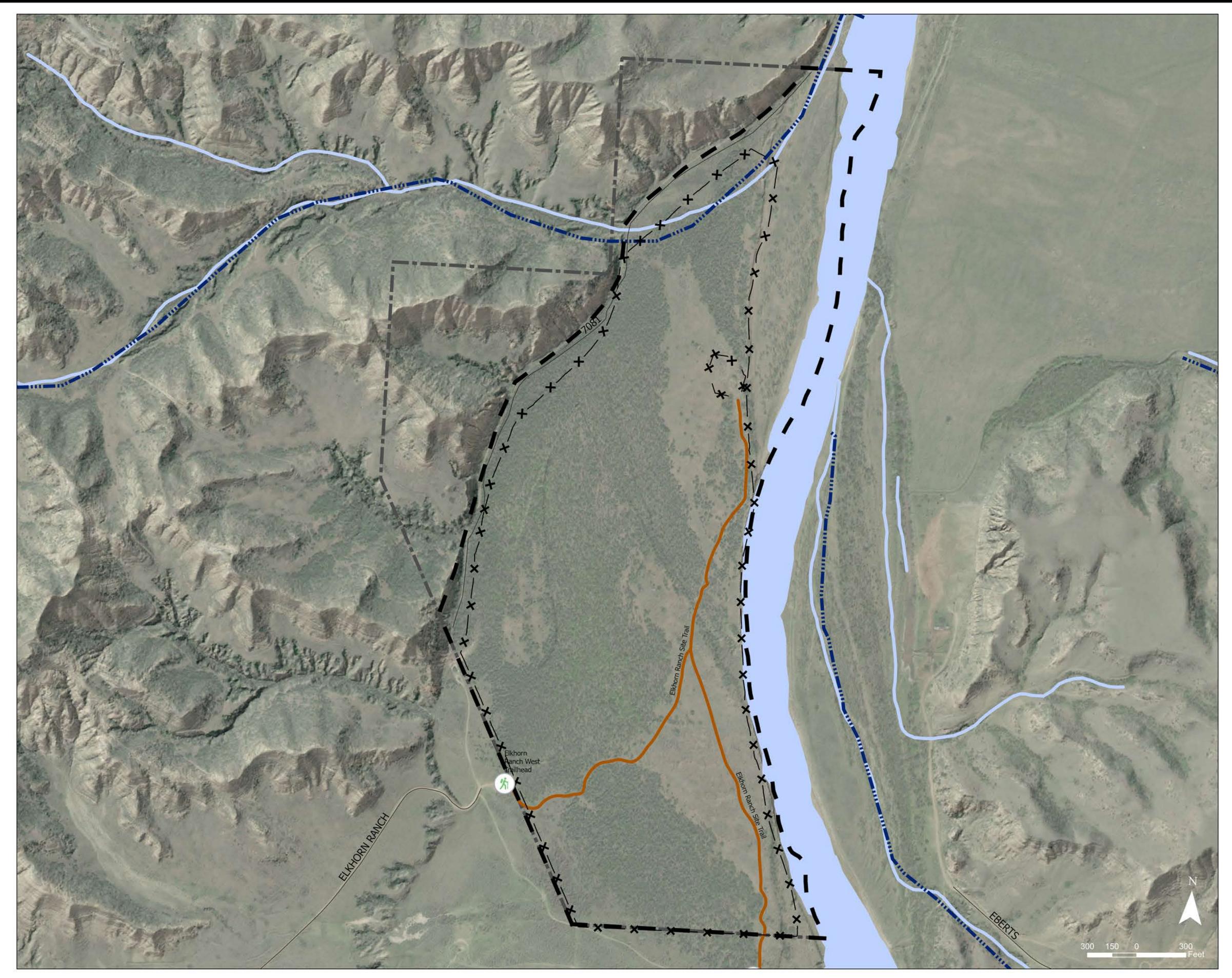
— Non-Motorized Trails

## Boundaries

Study Area Boundary

THRO Administrative Boundary

# **Elkhorn Ranch Existing Conditions: Project Area Overview**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

Trailheads

(1/1)

Fence

-x-

NPS Buildings

Roads

Hydrology

Intermittent

Rivers, Streams and Wetlands

Non-Motorized Trails

Boundaries

Study Area Boundary THRO Administrative Boundary

# North Unit **Existing Conditions: Project Area Overview**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

#### NPS Visitor Facilities



Campground Visitor Center

### Transmission Lines

\*\*\*\*\* 🚯 \*\*\*\*\*\*\*\*\*

#### Fence

 $-\mathbf{x}-$ 

### NPS Buildings - Temp

Roads

### Hydrology

Intermittent

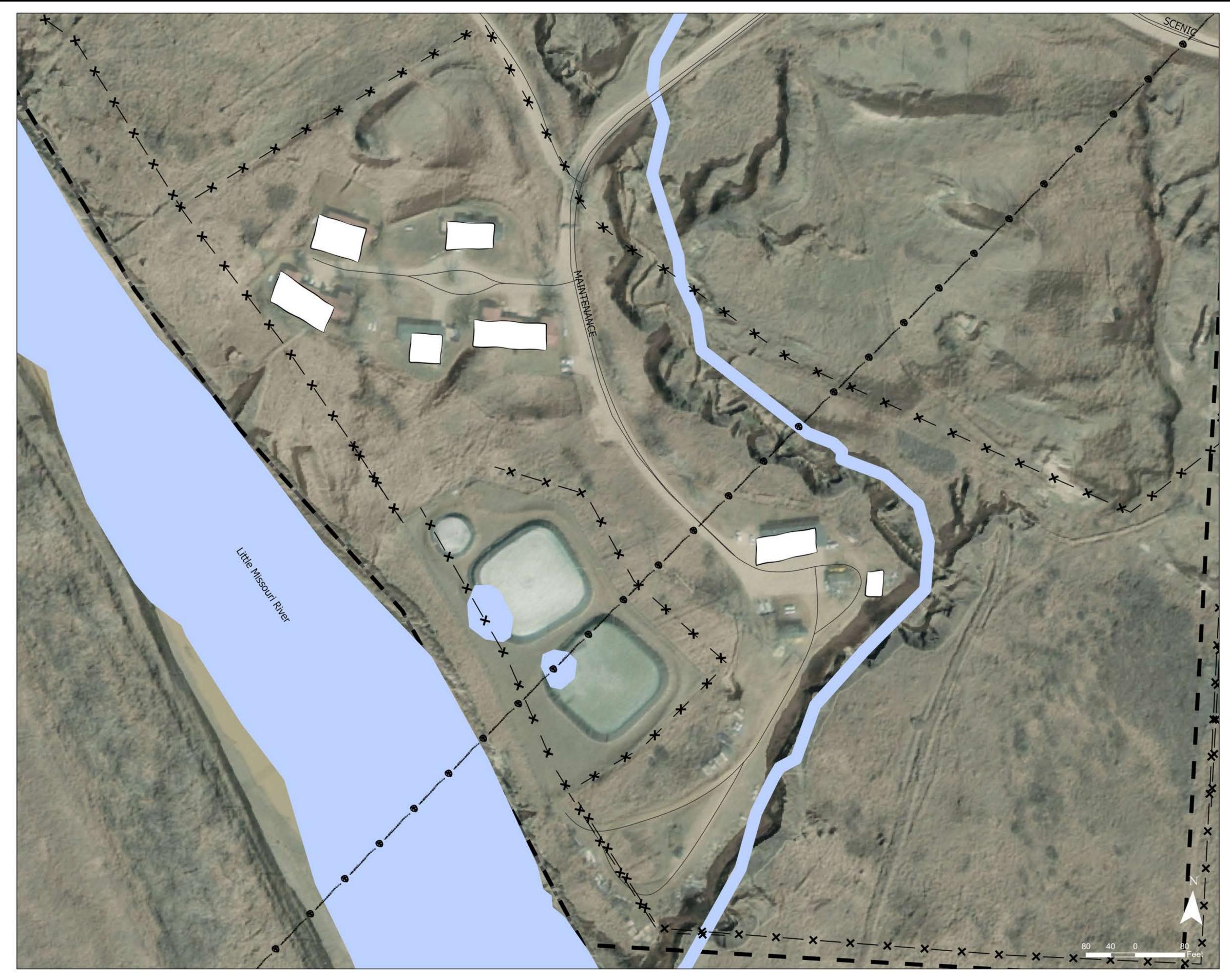
Rivers, Streams, and Wetlands

### Boundaries



Study Area Boundary

# North Unit Existing Conditions: Zoom In





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

#### NPS Visitor Facilities



Campground Visitor Center

### **Transmission Lines**

\*\*\*\*\* 🚯 \*\*\*\*\*\*\*\*

#### Fence

 $-\mathbf{x}-$ 

### NPS Buildings - Temp

Roads

### Hydrology

Intermittent

Rivers, Streams, and Wetlands

### Boundaries



Study Area Boundary

# North Unit Existing Conditions: Zoom In





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

#### NPS Visitor Facilities



Campground Visitor Center

### Transmission Lines

\*\*\*\*\* 🚯 \*\*\*\*\*\*\*\*

### Fence

 $-\mathbf{x}-$ 

### NPS Buildings - Temp

Roads

### Hydrology

Intermittent

Rivers, Streams, and Wetlands

### Boundaries



Study Area Boundary



# North Unit **Existing Conditions: Land Use**

BLDG or Heated Bay Dedicated to Resources: Fire Engine Secure Storage ATVs -Weed Control Equip -Workbench & Tools

Resources



# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

# NPS Visitor Facilities selection

### Facility Type

Hentry Station 💥 Visitor Center

### Transmission Lines

\*\*\*\*\* 🚯 \*\*\*\*\*\*\*\*\*

### Fence

 $-\mathbf{X}-$ 

## NPS Buildings - Temp (Full)

- Housing (Duplex)
- Housing (Single Family)
- Operations
- Operations (Office)
- Visitor Services

Roads

## Hydrology

Intermittent

Rivers, Streams, and Wetlands

### Boundaries

150 75 0 150 Feet

Study Area Boundary

# North Unit **Existing Conditions: Ecosystems**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

### NPS Visitor Facilities

Campground Visitor Center

## Transmission Lines

----

### Fence

-x-

## NPS Buildings - Temp

Roads

## Hydrology

Intermittent

Rivers, Streams, and Wetlands

## Boundaries

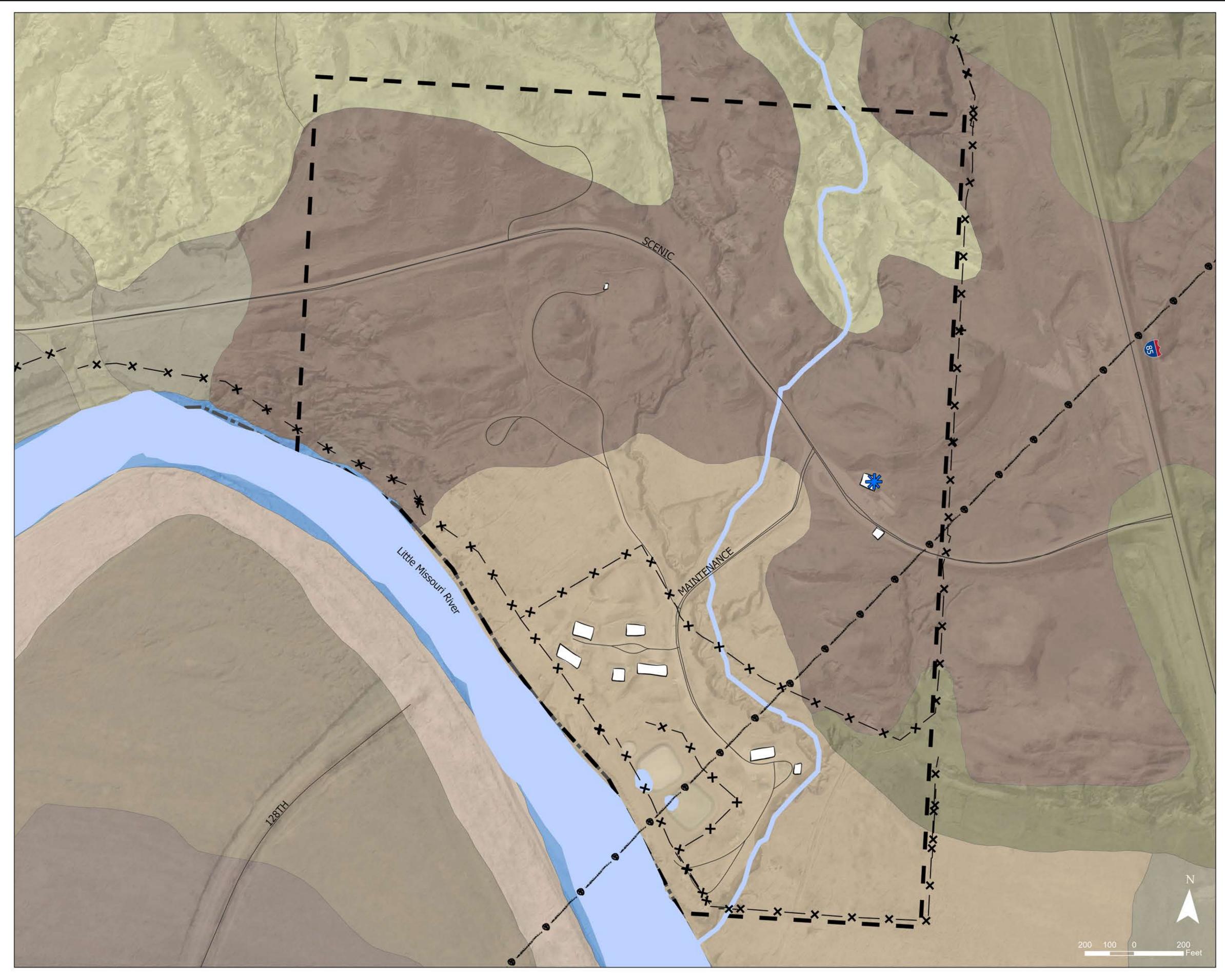
Study Area Boundary

THRO Admin Boundary

# Vegetation Mapping (1996)

Agriculture Area Developed Area Forbland Grassland **Invasive Species** Other/Unknown Shrubland Sparse Vegetation Water Wetland Woodland

# **North Unit Existing Conditions: Geology**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

### NPS Visitor Facilities



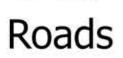
Campground Visitor Center

### Transmission Lines



-x-

# NPS Buildings - Temp



# Hydrology

Intermittent

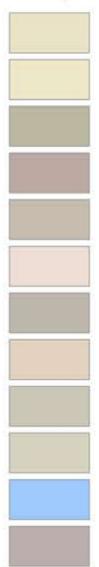
Rivers, Streams, and Wetlands

### Boundaries

Study Area Boundary

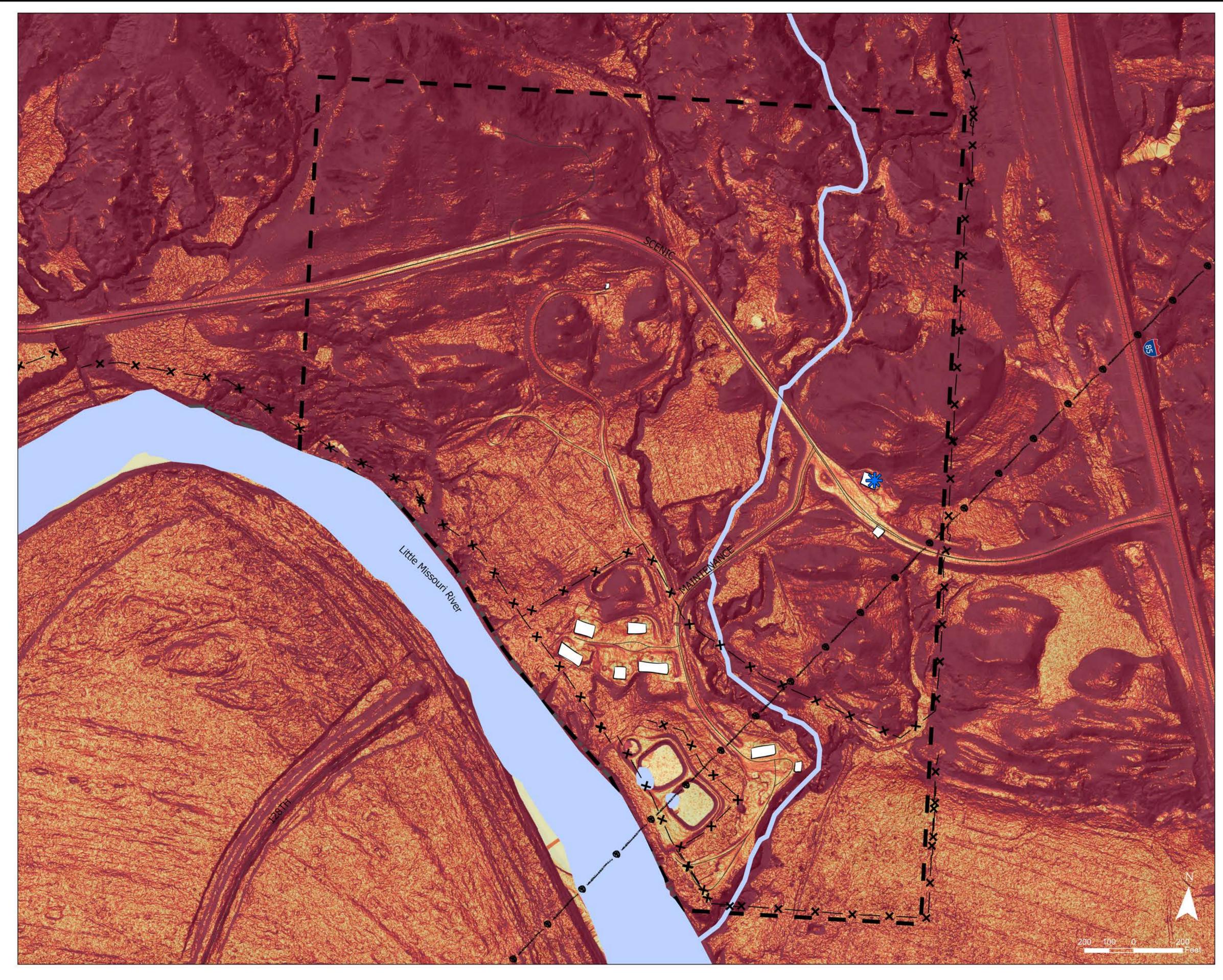
THRO Admin Boundary

### Mapunit Name



Badland-Arikara-Cabbart complex, 15 - 70% slopes Badland-Cabbart complex, 6 - 70% slopes Cabbart-Badland complex, 6 - 70% slopes Cabbart-Kremlin-Boxwell loams, 9 - 40% slopes, slumped Glendive fine sandy loam, 0 - 2% slopes, occasionally flooded Hanly fine sandy loam, 0 - 6% slopes, occasionally flooded Hanly fine sandy loam, wooded, 0 - 6% slopes, occasionally flooded Patent loam, 0 - 6% slopes, occasionally flooded Patent, Vanda-Gerda, barren complex, 0 - 9% slopes Patent-Patent, occasionally flooded-Glendive, 0 - 9% slopes Water Wolf Point silty clay loam, 0 - 2% slopes, occasionally flooded

# North Unit **Existing Conditions: Slope**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

#### NPS Visitor Facilities

Campground Visitor Center

### Transmission Lines

#### ----

Fence

 $-\mathbf{X}-$ 

## NPS Buildings - Temp

Roads

## Hydrology

Intermittent

Rivers, Streams, and Wetlands

#### Boundaries

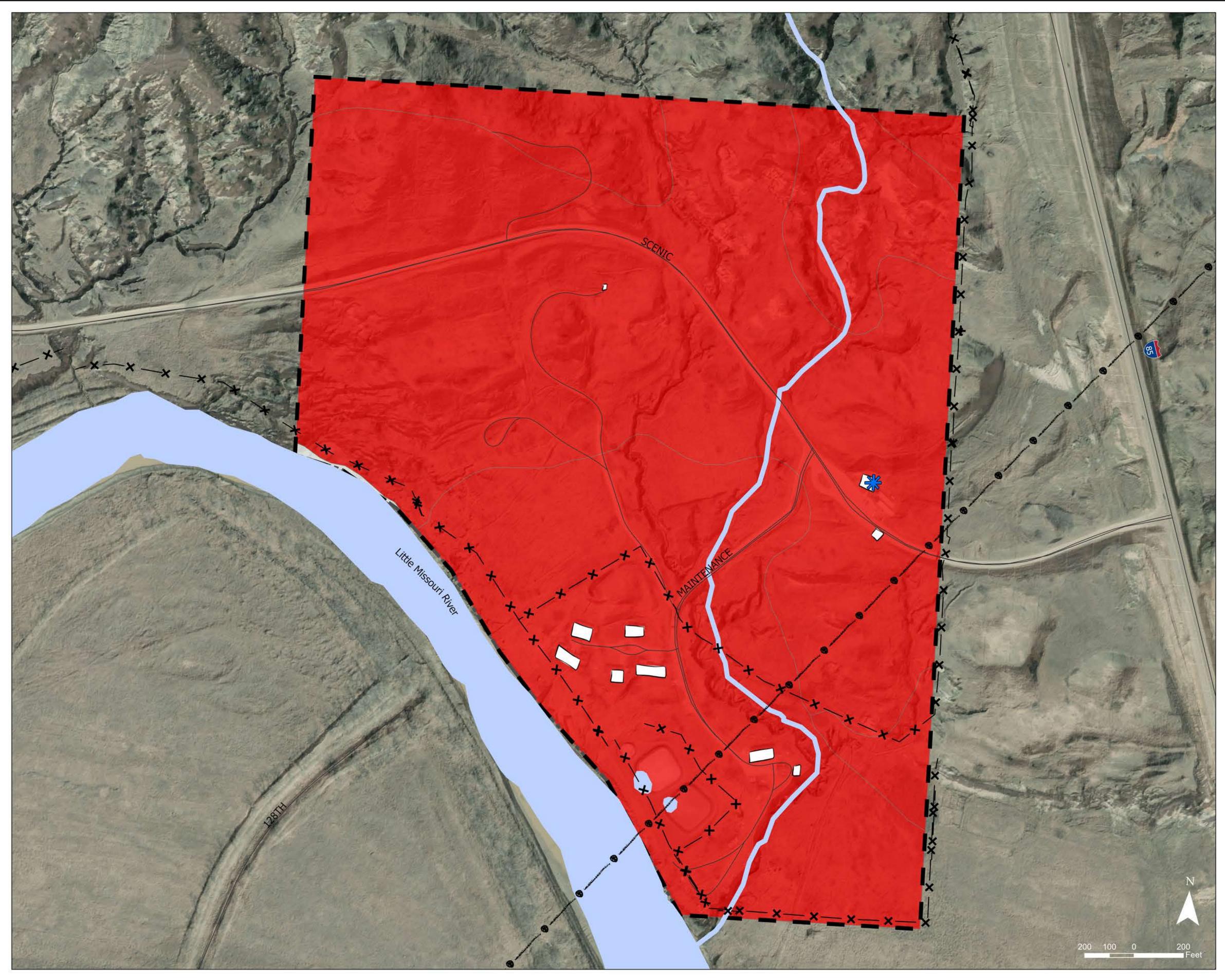
Study Area Boundary

THRO Admin Boundary

### Slope Analysis

0-2% 2-5% 5-8% 8-15% 15-25% 25%+

# North Unit Existing Conditions: Soil Quality for Development





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

## NPS Visitor Facilities



Campground Visitor Center

Transmission Lines

----

Fence

 $-\mathbf{x}-$ 

# NPS Buildings - Temp



Roads

## Hydrology

----- Intermittent

Rivers, Streams, and Wetlands

## Boundaries

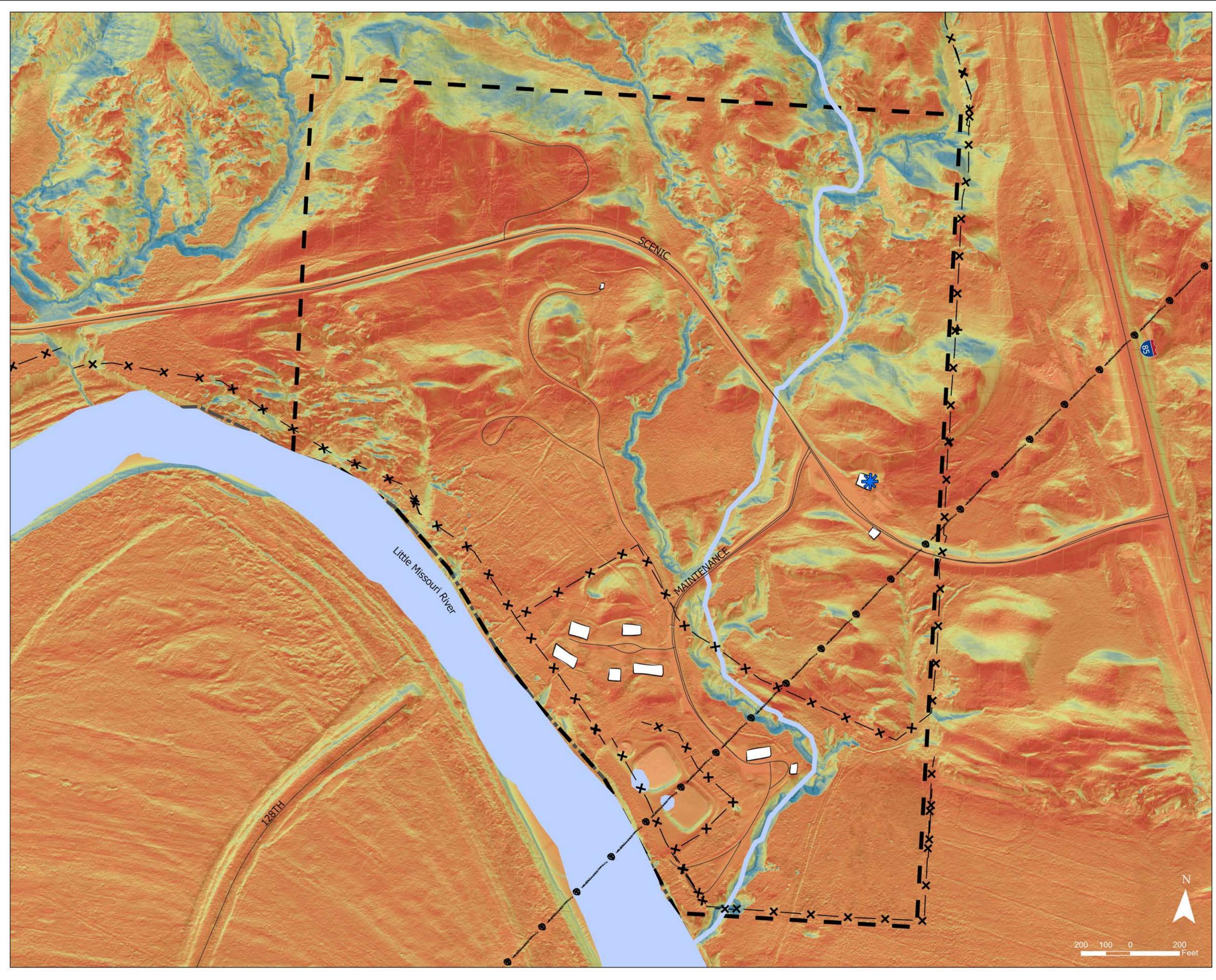
Study Area Boundary

THRO Admin Boundary

# Soil Quality for Development - North Area

Not Rated Very Limited

# North Unit **Existing Conditions: Solar Potential**





# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

#### NPS Visitor Facilities



Campground Visitor Center

### Transmission Lines

\*\*\*\*\* 🚯 \*\*\*\*\*\*\*\*\*

Fence

-x-

### NPS Buildings - Temp

Roads

### Hydrology

Intermittent

Rivers, Streams, and Wetlands

### Boundaries

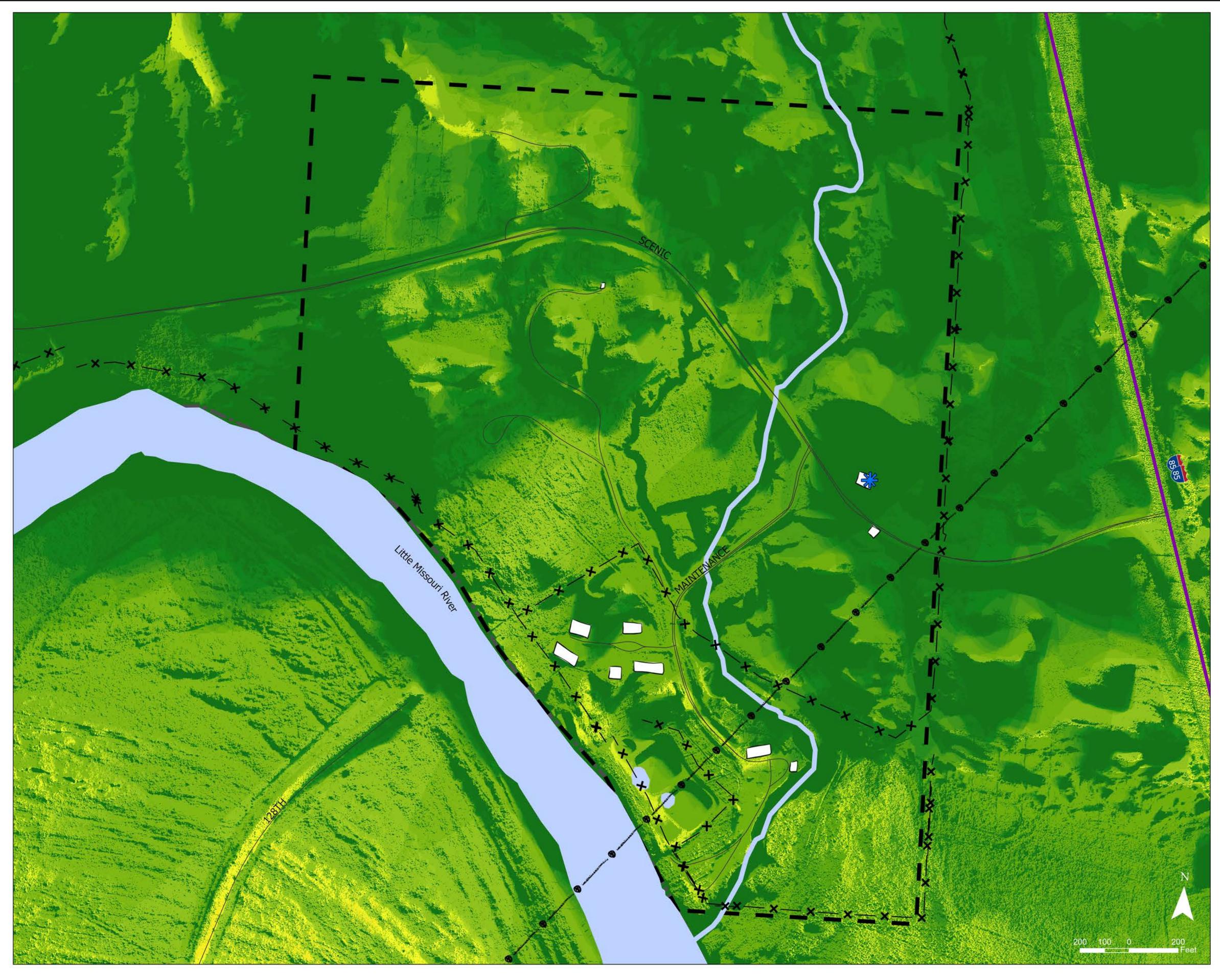
Study Area Boundary

THRO Admin Boundary

# Solar Radiation Potential

Highest Solar Potential

Lowest Solar Potential



# North Unit Existing Conditions: Viewshed



# Comprehensive Site Plan and **Environmental Assessment** THRO 258662

# Legend

## NPS Visitor Facilities



Campground Visitor Center

### Transmission Lines

### Fence

 $-\mathbf{x}-$ 

## NPS Buildings - Temp

Roads

Viewshed Analysis Corridor - North Unit

## Hydrology

----- Intermittent

Rivers, Streams, and Wetlands

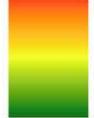
### Boundaries



Study Area Boundary

THRO Admin Boundary

Viewshed



Most Visible

Least Visible

# APPENDIX C WETLANDS STUDY

#### **APPENDIX E**

Wetlands Study

#### Wetland Delineation Report

Theodore Roosevelt National Park Comprehensive Site Plan and Environmental Assessment PMIS #258662



Prepared for:

National Park Service Denver Service Center 12795 West Alameda Parkway Denver, CO 25287 Prepared by:

Otak, Inc. 2828 Colby Avenue, Suite 401 Everett, WA 98201 Otak Project No. 33194

October 15, 2020



#### **Executive Summary**

This Wetland Delineation Report has been prepared for the National Park Service (NPS) for the Comprehensive Site Plan and Environmental Assessment project at Theodore Roosevelt National Park in Billings and McKenzie Counties, North Dakota. The NPS is preparing a comprehensive site plan to improve the visitor experience, address facility concerns and deferred maintenance, and guide refined development proposals for the South Unit and North Unit park entrance areas. Site plans will be evaluated in subsequent National Environmental Policy Act (NEPA) documents. NPS contracted with Otak, Inc. (Otak) to survey the project study areas in the North and South Units for wetlands and other waters of the United States (WOTUS) for compliance with NEPA, the Clean Water Act (CWA), and NPS *Director's Order (DO) #77-1: Wetland Protection*. Wetland functions have also been assessed to help evaluate potential impacts on wetlands from different design alternatives

Theodore Roosevelt National Park is situated in the Badlands of southwest North Dakota along the Little Missouri River. The study area for this report includes portions of the South Unit near the City of Medora in Billings County and the North Unit near Watford City in McKenzie County. The North Unit study area is located in Section 35 of Township 148 North, Range 099 West of the Public Land Survey System, and the South Unit study area is located in Sections 22, 23, 26 and 27 of Township 140 North, Range 102 West. Both study areas abut the Little Missouri River. The North Unit study area is approximately 159 acres in size, and the South Unit study area is approximately 96 acres in size.

Wetland and stream boundaries were delineated in the field by an Otak biologist on July 20, 21, and 22, 2020. Study areas were traversed on foot using curvy-linear transects that focused on landscape position and changes in vegetation. In accordance with federal USACE and NPS guidance and regulations, wetlands and other WOTUS were delineated in the field using the three-parameter approach detailed in the Corps of Engineers Wetlands Delineation Manual (USACE 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE 2010). In addition, NPS *Procedural Manual #77-1: Wetland Protection* (NPS 2016) requires that all wetlands, including artificial wetlands (e.g., excavated ponds), be mapped without regard to regulatory jurisdiction due to periodic changes in the types of wetlands that fall under CWA jurisdiction. Wetlands were classified according to the Federal Geographic Data Committee (FGDC) Wetlands Classification Standard (FGDC 2013), commonly known as the Cowardin classification system, (Cowardin et al, 1979), and the hydrogeomorphic (HGM) classification system (Brinson 1993).

Eight wetlands and three watercourses were identified and delineated in the North Unit study area. Three wetlands and five watercourses were identified and delineated in the South Unit study. Cowardin habitat classes predominantly included palustrine emergent wetlands, and wetland HGM classes included slope and depressional. Primary functions provided by the wetlands included moderation of groundwater flow, velocity reduction of surface water flow, flood storage, retention of particulates and pollutants for maintaining water quality, organic carbon export, and habitat diversity and connectivity in the semi-arid landscape. Mapped wetlands included natural features and artificial wetland habitats constructed for treating stormwater. Wetlands and watercourses in the study area are potentially regulated by the USACE under the CWA. The definition of WOTUS was recently updated on June 22, 2020 under the Navigable Waters Protection Rule. Jurisdictional assessments according to this new rule are included for all wetlands and watercourses delineated in the North Unit and South Unit study areas.

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#### Acronyms and Abbreviations

CFR	Code of Federal Regulations
CWA	Clean Water Act
DO	Director's Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAC	Facultative
FACW	Facultative wetland
FACU	Facultative upland
FGDC	Federal Geographic Data Committee
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
NEPA	National Environmental Policy Act
NL	Not Listed
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary high water mark
PEM	Palustrine emergent
PFO	Palustrine forested
PSS	Palustrine scrub shrub
TNW	Traditional Navigable Water
UPL	Upland
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States

# Chapter 1. Introduction

This Wetland Delineation Report has been prepared for the National Park Service (NPS) for the Comprehensive Site Plan and Environmental Assessment project at Theodore Roosevelt National Park in Billings and McKenzie Counties, North Dakota. The NPS is preparing a comprehensive site plan to improve the visitor experience, address facility concerns and deferred maintenance, and guide refined development proposals for the South Unit and North Unit park entrance areas. Site plans will be evaluated in subsequent National Environmental Policy Act (NEPA) documents. NPS contracted with Otak, Inc. (Otak) to survey the project study areas in the North and South Units for wetlands and other waters of the United States (WOTUS) for compliance with NEPA, the Clean Water Act (CWA), and NPS *Director's Order (DO) #77-1: Wetland Protection*. Wetland functions have also been assessed to help evaluate potential impacts on wetlands from different design alternatives.

The methods and tools used to prepare this report are provided in Appendix A. Background information and report figures are provided in Appendix B, and wetland determination data forms are provided in Appendix C.

### 1.1 Project Location and Landscape Setting

Theodore Roosevelt National Park is situated in the Badlands of southwest North Dakota along the Little Missouri River. The study area for this report includes portions of the South Unit near the City of Medora in Billings County and the North Unit near Watford City in McKenzie County (Appendix B – Figure 1 – Locations Map). The study areas within each park unit are shown on Figures 2 through 7 in Appendix C. The North Unit study area is located in Section 35 of Township 148 North, Range 099 West of the Public Land Survey System, and the South Unit study area is located in Sections 22, 23, 26 and 27 of Township 140 North, Range 102 West. Both study areas abut the Little Missouri River. The North Unit study area is approximately 159 acres in size, and the South Unit study area is approximately 96 acres in size.

The South Unit study area includes a portion of the City of Medora, NPS maintenance facilities, employee housing, and offices, and the South Unit Visitor Center and parking lot. East River Road is generally aligned north and south through the center of the study area. The west side of the study area is within the mapped 100-year floodplain of the Little Missouri River. Riparian woodlands are located in the floodplain of the Little Missouri River west of East River Road. Two decommissioned sewage lagoons were previously located west of East River Road in the floodplain, and have since been revegetated and restored within the landscape. Culverts under East River Road allow surface water to flow west toward the Little Missouri River. Floodgates have been installed on the culvert outlets west of East River Road to prevent floodwater from the Little Missouri River reaching the City of Medora and NPS facilities east of the road.

The North Unit study area includes NPS maintenance facilities, employee housing, two sewage lagoons, North Unit Visitor Center and parking area, and a well house. Scenic Drive is aligned east and west through the center of the North Unit study area, and Maintenance Way is aligned north to south and provides access to the employee housing and maintenance areas. A gravel road provides access to the well house northwest of the employee housing. Several culverts Barbed wire fences ae located along the southern and eastern edges of the study area that align with the NPS property boundary.

The badlands landscape includes areas around the Little Missouri River that have formed by erosion and collapse of the soft silt or clay soils following lignite coal bed burnings. Badly eroded clay-scoria slopes, buttes and steep canyons are common throughout the badlands landscape, and ephemeral and intermittent streams are common in steep valleys. The landscape includes abrupt changes in substrate, slope, soils and salinity that result in a fragmented collection of habitats supporting a patchwork of plant communities. The climate of southwestern North Dakota is characterized by long, cold winters; short, hot summers; low rainfall and low humidity. Annual precipitation averages 15-16 inches, which mostly falls during the growing season. Daytime temperatures over 100 degrees Fahrenheit are common during the summer months, and winter low temperatures occasionally exceed -40 degrees Fahrenheit (NDGFD 2020, Godfread 1994).

# Chapter 2. Methods

This chapter summarizes the methods used in accordance with federal guidance in delineating wetland and stream boundaries in North Dakota for the study areas in the North and South Units. See Table A-1 in Appendix A for references and further details regarding the methods used to produce this report.

# 2.1 Review of Available Published Information

Available published information was reviewed prior to the field investigation to identify any previously documented wetlands, streams, or other pertinent site characteristics (e.g., vegetation community patterns, topography, soils, or water courses) that would indicate the presence of wetlands and streams within the study areas. These maps are typically used as guidance, and do not supersede conditions in the field. As part of this effort Otak biologists reviewed the following sources:

- National Wetlands Inventory (NWI) map (USFWS 2020);
- Soil survey from the United States Natural Resources Conservation Service (NRCS) (NRCS 2020).

Appendix B includes figures associated with the background review, including: NWI maps (Figures 2 and 3) and USGS topography maps (Figures 4 and 5).

#### North Unit

NWI maps one linear riverine habitat flowing north to south and transitioning to a linear freshwater emergent wetland that crosses Scenic Drive and Maintenance Way before discharging to Little Missouri River. Little Missouri River is mapped as riverine habitat. Two excavated freshwater ponds are mapped near the southern study area boundary where the two sewage lagoons are located. No other wetlands are mapped by NWI within the study area. Seven different soil units are mapped within the North Unit study area, but they are not listed as hydric.

Mapped Soil Unit	Slope %	Drainage Class	Landform	Parent Material	Hydric?
Cabbart-Kremlin Boxwell loams	9-40, slumped	Well drained	Ridges	Loamy residuumRidgesweathered from siltstoneand mudstone	
Badland-Cabbart complex	6-70	Well drained	Hillslopes	Shale and siltstone	No
Cabbart-Badland complex	6-70	Well drained	Hillslopes	Residuum weathered from calcareous siltstone	No
Badland-Arikara- Cabbart complex	15-70	Well drained	Hillslopes	Shale and siltstone	No
Patent loam	0-6	Well drained, occasionally flooded	Alluvial fans	Fine-loamy alluvium	No
Glendive fine sandy loam	0-2	Moderately well drained, occasionally flooded	Flood-plain steps	Coarse-loamy alluvium derived from sedimentary rock	No
Hanly fine sandy loam	0-6	Moderately well drained, occasionally flooded	Flood-plain steps	Stratified sandy alluvium derived from sedimentary rock	No

#### Table 2-1— North Unit: NRCS Soil Units

#### <u>South Unit</u>

NWI maps two excavated freshwater emergent wetlands within a large field east of East River Road where the decommissioned sewage lagoons were located. These artificial features were originally mapped in 1983 and are no longer present in the landscape after they were decommissioned. Little Missouri River is mapped as riverine habitat. No other wetland habitats are mapped by NWI within the study area. Six different soil units are mapped within the South Unit study area, but they are not listed as hydric.

Mapped Soil Unit	Slope %	Drainage Class	Landform	Parent Material	Hydric?
Patent-Badland- Cabbart complex	6-50	Well drained	Alluvial fans	Slope alluvium derived from sandstone and siltstone	No
Badland	9-150	No drainage class listed. Runoff class listed as High.	Hillslopes	Shale and siltstone	No
Havre silt loam	0-2	Well drained	Flood-plain steps	Fine-loamy alluvium derived from sedimentary rock	No
Hanly fine sandy loam	0-6	Moderately well drained	Flood-plain steps	Stratified sandy alluvium derived from sedimentary rock	No
Littlemo-Chanta complex	0-2	Well drained	Paleoterraces	Fine-loamy alluvium	No
Tinsley-Chanta complex	6-35	Excessively drained	Escarpments on paleoterraces	Sandy and gravelly alluvium	No

# 2.2 Precipitation Data and Analysis

#### 2.2.1 Evaluation of the Growing Season

Wetland hydrologic conditions are considered present if soils are inundated or saturated to the surface continuously for at least 5 percent of the growing season in most years (50 percent probability of recurrence) (USACE 1987). The technical standard for disturbed or problematic sites requires 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season, at a minimum frequency of 5 years in 10 (National Research Council 1995).

The beginning and ending dates of the growing season can be defined based on two indicators of biological activity that are readily observable in the field: (1) above ground growth and development of vascular plants, and (2) soil temperature. However, due to seasonal fluctuations from year to year the growing season dates may also be approximated by the number of frost-free days, defined as the time from the last date in spring when the ambient air temperature drops to 28°F, to the first date in fall when it drops to 28°F, over a 30-year period (USACE 2010).

As such, the beginning and ending dates for the growing season for the project site were estimated from longterm weather records (1979-2019) as the median dates (50 percent probability) for the first and last 28°F days at the Waterford City 14S climate station. The Waterford City 14S climate station is the closest representative station between the North and South Units that have available WETS tables and long-term records. Based on long-term weather records the average start and end dates for the growing season for the area are May 9 and September 27, respectively, for a total growing season of 141 days (NRCS 2020a). Continuing wetland hydrologic conditions must be present for at least 7 consecutive days during the growing season for this site.

#### 2.2.2 Precipitation Data during Field Investigation

The field survey for the project was conducted on July 20, 21, and 22, 2020. The area received 0.99 inches of precipitation in the two-week period (July 5 – July 19) prior to the field survey on July 20, 2020 as measured at the Grassy Butte 2ENE climate station. The Grassy Butte 2ENE climate station is the closest representative station between the North and South Units with available daily precipitation data (NRCS 2020a). Precipitation amounts for the three months preceding the field survey were normal in April 2020, normal in May 2020, and above normal in June 2020 (Table 2-2).

Category	April 2020	May 2020	June 2020
Recorded Precipitation (inches)	0.82	1.33	4.44
Precipitation Average	1.15	2.41	2.94
30-70% Normal Range (inches) from 1979-2019	0.56-1.39	1.21-2.95	2.02-3.51
Comparison to Normal Range	Normal	Normal	Above normal

Table 2-3—Summary of Precipitation Data from April 1 to July 1, 2020

Source: NRCS 2020a.

### 2.3 Field Investigation

Wetland and stream boundaries were delineated in the field by an Otak biologist on July 20, 21, and 22, 2020. The South Unit was surveyed on July 20, 2020 and the North Unit was surveyed on July 21 and 22, 2020. Study areas were traversed on foot using curvy-linear transects that focused on landscape position and changes in vegetation.

*Wetlands,* as regulated by the United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (USEPA) under the CWA, are defined at 33 Code of Federal Regulations (CFR) 328.3(c) – Definitions as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." *Ordinary high water mark* is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." NPS *Procedural Manual #77-1: Wetland Protection* (NPS 2016) has a slightly broader definition of wetlands to include areas that may contain only one of the three parameters required per USACE guidance as long as wetland hydrology is present, such as along shorelines where wave action may scour vegetation and prevent hydric soil indicators from developing.

#### 2.3.1 Wetlands

In accordance with federal USACE and NPS guidance and regulations, wetlands were delineated in the field using the three-parameter approach detailed in the Corps of Engineers Wetlands Delineation Manual (USACE 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE 2010). Following routine methodology, data on vegetation, soils, and hydrology were collected at paired (upland/wetland) data points to document upland/wetland boundaries. The USACE wetland determination data forms for the data points are provided in Appendix C. In addition, NPS *Procedural Manual* #77-1: *Wetland Protection* (NPS 2016) requires that all wetlands, including artificial wetlands (e.g., excavated ponds), be mapped without regard to regulatory jurisdiction due to periodic changes in the types of wetlands that fall under CWA jurisdiction.

#### **Vegetation**

Representative upland and wetland vegetation communities were documented at each data point during the field survey. Typically, three vegetation strata are inventoried at each data point, including trees within a 30-foot diameter plot, shrubs within a 15-foot diameter plot, and non-woody herbaceous plants (including forbs, grasses, sedges, and rushes) within a 5-foot diameter plot. Plant species in each stratum were identified and absolute percent cover was recorded. Each species was listed following the scientific nomenclature given in the United States Department of Agriculture (USDA) PLANTS database (NRCS 2020b). The wetland indicator status for each species was assigned using the *2018 National Wetland Plant List for Great Plains Region* (USACE 2018).

The dominance test was the primary indicator used to determine the presence or absence of hydrophytic vegetation. A data point is considered to have a hydrophytic vegetation community if more than 50 percent of the dominant species have an indicator status of facultative (FAC), facultative-wetland (FACW), or obligate (OBL). Upland plant indicator statuses include upland (UPL) and facultative upland (FACU). Plants not listed (NL) are also typically found in uplands. Dominant species are defined as those that individually or collectively account for more than 50 percent of the total areal coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total areal coverage (USACE 2010). If more than 50 percent of the dominant plant species in a community have wetland indictor status of OBL, FACW, or FAC, then the plant community is considered hydrophytic (wetland).

#### <u>Soils</u>

Per USACE protocol, soil samples were obtained at representative data points by digging a pit to a depth of at least 18 inches if possible, to determine the presence or absence of hydric soil indicators using the *Field Indicators of Hydric Soils in the United States*, Version 8.2 (NRCS 2018). Soil colors were evaluated against a Munsell® soil color chart (GretagMacbeth 2000) to distinguish hydric from non-hydric soils.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (USACE 2010). Hydric soils may exhibit certain characteristics that can be observed in the field; such as: high organic content, accumulation of sulfidic material, greenish or bluish-gray color (gley formation), depleted matrices, and development of redoximorphic features. Hydric soils in the study area were frequently saturated within 12 inches of the surface and exhibited dark and/or depleted matrices with redoximorphic features. Hydric soils typically had heavy clay content that retained surface water or maintained soil saturation for long durations.

#### **Hydrology**

Wetland hydrologic conditions are considered present if, during the growing season, an area is inundated or saturated to the surface continuously for at least 5 percent of the growing season in most years (50 percent probability of recurrence) (USACE 1987). Five percent of the growing season in the study area is seven days. The presence of primary and secondary wetland hydrologic indicators is used to determine the presence or absence of wetland hydrology at each wetland data point.

Primary indicators of wetland hydrology may include, but are not limited to, surface water, soil saturation within 12 inches of the surface, shallow water table, and evidence of previous water inundation or saturation (e.g., watermarks, algal mats, sediment deposits). Secondary indicators may include wetland drainage patterns, geomorphic position, stunted or stressed plants, and water-stained leaves. When at least one primary or two secondary indicators were observed, wetland hydrology was determined to occur during the growing season long enough to result in wetland conditions. Wetland hydrology indicators observed on site included high water table, surface water, soil saturation within 12 inches, salt crust, and sediment deposits.

#### 2.3.2 Ordinary High Water Mark

The OHWM along Little Missouri River and tributaries was located in the field based on the methodology outlined in USACE Regulatory Guidance Letter 05-05 (USACE 2005). Identification of OHWM was based on the evaluation of stream physical characteristics, such as: presence of bed and banks, a natural line impressed on the bank, change in sediment and vegetation characteristics, wracking, erosion/scour, and silt deposits.

### 2.4 Wetland and Stream Classification and Functional Assessment

Wetlands were classified according to the Federal Geographic Data Committee (FGDC) Wetlands Classification Standard, commonly known as the Cowardin classification system, (Cowardin et al, 1979), and the hydrogeomorphic (HGM) classification system (Brinson 1993). The FGDC Wetlands Classification Standard primarily functions to classify wetlands by habitat types based on vegetation, and the HGM system assesses the chemical, physical, and biological functions of wetlands based on geomorphic setting and water source. HGM classes generally include lake-fringe, slope, depressional, riverine, and flats.

Wetland functions and values were evaluated subjectively based on best professional judgement using a descriptive approach (USACE 1999), including: groundwater recharge/discharge, flood flow alteration, fish and shellfish habitat, sediment/toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational/scientific value, uniqueness/heritage, visual quality/aesthetics, and endangered species habitat. Wetland and stream buffer conditions were qualitatively assessed based on vegetation cover, land use, and presence of invasive species.

### 2.5 Mapping Methods

Wetland and stream boundaries were located in the field by the Otak biologist and surveyed with a GeoXH 6000 Series handheld Global Positioning System (GPS) unit. The GPS data was differentially corrected in the office and then utilized in Geographical Information Systems (GIS) mapping programs to prepare maps for this report. Due to access and safety precautions, several data points were collected at the top of steep slopes and locations of wetland or stream boundaries were estimated laterally using offsets. Offsets were used at the top of bluff along the Little Missouri River and the steep ravine at the lower end of Tributary A in the North Unit. All other features in the North and South Units were accessible.

# Chapter 3. Existing Conditions – North Unit

Eight wetlands and three watercourses were identified and delineated in the North Unit study area as shown on Figure 6 in Appendix B. Wetland determination data forms are provided in Appendix C. Wetlands and streams characteristics are summarized in Tables 3-1 to 3-10.

Resource <sup>1</sup>	Wetland Classification		Size/Length in Study Area		Comments	
	FGDC <sup>2</sup>	HGM	Acre	Linear Feet		
Wetland 1A	PEM1A	Slope	1.30	-	Linear slope wetland in confined	
Wetland 1B	PEM1A	Slope	0.70	-	drainage supported by	
Wetland 1C	PEM1A	Slope	0.43	-	groundwater seeps and separated by roads/culverts	
Wetland 2	PEM1A	Slope	0.57	-	Broad slope wetland on hillside; drains to Tributary A/Wetland 1 system	
Wetland 3	PEM1B	Depressional	0.01	-	Depressional wetland, groundwater seep on hillside	
Wetland 4	PEM1A	Depressional	0.01	-	Depression at culvert outlet south of entrance drive	
Wetland 5	PEM1A	Depressional	<0.01	-	Depression at culvert inlet north of entrance drive	
Wetland 6	РАВЗН	Depressional	0.17	-	Depression with groundwater seep, receives overbank flooding, recent beaver browse	
Tributary A	R4SBC	-	-	~3,418	Originates offsite; flows in incised channel toward confluence with Wetland 1; then flows in deep ravine past maintenance shed	
Tributary B	R4SBCx	-	-	~315	Ephemeral connection between Wetland 2 and Tributary A/Wetland 1; excavated	
Little Missouri River	R2USA, R2UBF	-	-	~2,572	OHW located near toe of bluff; regular calving and slope failure from scour during high flows	

Table 3-1—Delineated Wetlands and Streams – North Unit

Note:

1. Wetlands shown on Figure 6 in Appendix B.

 FGDC/Cowardin classes: PEM1A = Palustrine emergent persistent temporarily flooded; PEM1B = Palustrine emergent persistent seasonally saturated; PAB3H = Palustrine aquatic bed rooted vascular permanently flooded; R4SBC = Riverine intermittent streambed seasonally flooded; R4SBCx = Riverine intermittent streambed seasonally flooded excavated; R2USA = Riverine perennial unconsolidated shore temporarily flooded; R2UBF = Riverine perennial unconsolidated bottom semi-permanently flooded.

# 3.1 Delineated Wetlands and Functions Evaluation

Eight wetlands were delineated in the North Unit study area identified on Figure 6 in Appendix B as Wetlands 1A, 1B, 1C, 2, 3, 4, 5, and 6. Wetland 1 is a broad linear slope wetland in a confined drainage that is conveyed through culverts underneath Scenic Drive and Maintenance Way. Wetland 1 was subdivided into Wetland 1A, 1B, and 1C for mapping purposes in this report based on the hydrological breaks caused by the road crossings. Wetland 1 confluences with Tributary A just west of Maintenance Way near the employee housing complex. Wetland 1C transitions to riverine habitat (Tributary A) where the drainage narrows and the gradient increases closer to where it discharges to the Little Missouri River.

Wetland 1 is supported by groundwater springs and surface runoff following precipitation events. Wetland 1 had shallow surface water flowing in rivulets through dense herbaceous vegetation during the site visit, and contained multiple step-pools in which small pockets of water transitioned into vegetated wetlands where the drainage had aggraded over time. Evidence of flash floods were also observed including wrack lines and vegetative debris along the drainage walls approximately five feet above the wetlands and culvert inlets. The substrate was dominated by clay fines that had eroded from adjacent upland areas. Hydric soil indicators included depleted matrices with redoximorphic concentrations in the upper soil profile.

Habitat in Wetland 1 is classified as palustrine emergent persistent temporarily flooded (PEM1A). Vegetation in Wetland 1 was dominated by three-square (*Shoenoplectus pungens*, OBL), slender-beak sedge (*Carex athrostachya*, FACW), salt-grass (*Distichlis spicata*, FACW), spike-rush (*Eleocharis palustris*, OBL), and prairie cordgrass (*Spartina pectinata*, FACW). Hardstem bulrush (*Shoenoplectus acutus*, OBL) populated springs and ponded areas with extremely soft mud substrates (e.g. quicksand). Distinct topographic breaks marked transitions to the upland riparian community that generally consisted of longleaf sage (*Artemisia longifolia*, FACU), wolfberry (*Symphoricarpos occidentalis*, UPL), smooth brome (*Bromus inermis*, UPL), crested wheatgrass (*Agropyron cristatum*, NL/UPL), and sweet clover (*Melilotus officinalis*, FACU).

Primary functions provided by the linear slope Wetlands 1A, 1B, and 1C include moderation of groundwater flow, velocity reduction of surface water flow, retention of particulates, organic carbon export in the dry landscape, maintenance of plant community, habitat diversity and connectivity between wetlands, and maintaining distribution and abundance of vertebrates and invertebrates. Chorus frogs (*Pseudacris nigrita*) were observed throughout Wetland 1. Wetland 1 provides educational and scenic value due their rarity in the landscape and because they can be seen from Scenic Drive. Wetland 1 characteristics and functions are summarized in Table 3-2.

WETLAND 1A-1B-1C – INFORMATION SUMMARY						
Location:	Centrally located in the study area flowing north to south					
	we the second	Size (in study area)	>2.43 acres			
	it is the state	FGDC Classification	PEM1A			
C. C. C. C.	Rest and Rest	HGM Classification	Slope			
		Wetland Data Sheet	DP5-North			
		Upland Data Sheet	DP6-North			
		Regulated under the CWA?	Yes, abuts tributary to TNW.			
		Delineation Rationale	Satisfies all three wetland criteria.			
Dominant Vegetation	Shoenoplectus pungens, Carex Spartina pectinata, Shoenoplect		, Eleocharis palustris,			
Soils	Silty clay; 10YR 4/2 and 3/2 with	n redox features and depletions				
Hydrology	Surface water, High water table,	Saturation.				
Primary Wetland Function	Primary Wetland Functions-Values Summary					
Water Quality	Sediment retention/stabilization, nutrient production and export.					
Hydrologic	Floodflow alteration, groundwater discharge.					
Habitat	Provides habitat diversity and migration corridors for a variety of wildlife.					
Values	Educational/scientific research a and visual quality/aesthetics bec					

#### Table 3-2—Wetland 1A-1B-1C Summary

Wetland 2 is a linear slope wetland with undulating depressions from livestock use and previous disturbances. Wetland hydrology is supported by a groundwater seeps at its northern end along its eastern edge where salt flats have developed interspersed with salt-tolerant vegetation patches. Wetland 2 also receives surface runoff from the surrounding concave landscape. Disturbances in the wetland and buffer include overhead utility lines, fencing, and livestock use.

Wetland 2 habitat is classified as palustrine emergent persistent temporarily flooded (PEM1A). Dominant wetland vegetation included alkaligrass (*Puccinellia nutalliana*, OBL), narrow-leaved cattail (*Typha angustifolia*, OBL), Canada thistle (*Cirsium arvense*, FAC), and three-square. Surface water flows from north to south, and an excavated channel connects Wetland 2 to a natural erosional channel (Tributary B) that discharges to Wetland 1C and Tributary A. Distinct topographic breaks marked transitions to the grassland buffer community that generally consisted of smooth brome, crested wheatgrass, prairie coneflower (*Ratibada columnifera*, UPL/NL), and sweet clover.

Primary functions provided by Wetland 2 include moderation of groundwater flow, velocity reduction of surface water flow, retention of particulates, organic carbon export in the dry landscape, maintenance of plant community, habitat diversity and connectivity between wetlands, and maintaining distribution and abundance of vertebrates and invertebrates. Wetland 2 also functions to remove excess nutrients from livestock waste. Wetland 2 characteristics and functions are summarized in Table 3-3.

WETLAND 2 – INFORMATION SUMMARY						
Location:	Along the eastern property boundary south of Scenic Drive and entrance kiosk					
	and the second second	Size (in study area)	0.57 acre			
		FGDC Classification	PEM1A			
and the second	The second second	HGM Classification	Slope			
	town of the state	Wetland Data Sheet	DP1-North			
		Upland Data Sheet	DP2-North			
		Regulated under the CWA?	Yes, abuts tributary to TNW.			
		Delineation Rationale	Satisfies all three wetland criteria.			
	CARRIE CON					
Dominant Vegetation	Puccinellia nutalliana, Typha an	gustifolia, Cirsium arvense, S	Shoenoplectus pungens			
Soils	Silty clay, 10YR 3/2 and 3/1 with	n redox features and depletion	ns in the upper profile			
Hydrology	High water table, Saturation, Su	rface water, Salt crust				
Primary Wetland Function	ons-Values Summary					
Water Quality	Water Quality         Sediment retention/stabilization, nutrient production and export.					
Hydrologic	Floodflow alteration, groundwater discharge.					
Habitat	Provides habitat diversity and migration corridor for a variety of wildlife; food source for birds due to abundant insect population.					
Values	Uniqueness/heritage due to rarit	ty in the landscape.				

#### Table 3-3—Wetland 2 Summary

Wetland 3 is a small depressional wetland supported by a shallow water groundwater seep. Livestock trampling has caused the side slopes of the linear feature to collapse, which causes water to temporarily pond and develop saturated soil conditions. It appears isolated from other surface waters and wetland habitats, but during snowmelt and large precipitation events it likely overflows into a wooded draw that connects to Wetland 1C approximately 300 feet downslope to the southwest.

Habitat in Wetland 3 is classified as palustrine emergent persistent seasonally saturated (PEM1B). Dominant vegetation includes spike rush (*Elocharis palustris*, OBL), cocklebur (*Xanthium strumarium*, FAC), and Canada thistle. Distinct topographic breaks mark the transition to the upland plant community consisting of longleaf sage, smooth brome, crested wheatgrass, and bluegrass (*Poa pratensis*, FACU).

Primary functions provided by Wetland 2 include maintaining water quality (e.g., sediment and nutrient retention from livestock use) and providing hydrologic functions (e.g., groundwater recharge and discharge). Wetland 3 has low habitat functions and value due to the ongoing disturbance regime and isolation on the landscape. Wetland 3 characteristics and functions are summarized in Table 3-4.

WETLAND 3 – INFORMATION SUMMARY						
Location:	East of Maintenance Way and south of Scenic Drive on hillside slope					
	Production of the	Size (in study area)	0.01 acre			
	Contra and All St	FGDC Classification	PEM1B			
		HGM Classification	Depressional			
and the second second	and the second	Wetland Data Sheet	DP3-North			
A STATE OF STATE		Upland Data Sheet	DP4-North			
AN AN	Real Castron M	Regulated under the CWA?	Yes, surface connection during storm events to Wetland 1C/Tributary A.			
NO A SUPPORT		Delineation Rationale	Satisfies all three wetland criteria.			
And the second						
Dominant Vegetation	Elocharis palustris, Xanthium str	rumarium, Cirsium arvense				
Soils	Clay, 10YR 3/2 with redox feature	res and depletions in the uppe	er soil profile			
Hydrology	High water table, Saturation, Surface water.					
Primary Wetland Functions-Values Summary						
Water Quality	Sediment and nutrient retention.					
Hydrologic	Groundwater recharge and discharge.					
Habitat	Low habitat functions due to livestock use.					
Values	s Low value due to disturbance regime and isolation on the landscape.					

#### Table 3-4—Wetland 3 Summary

Wetlands 4 and 5 are small (<0.01 acre) depressional wetlands located at the toe of the entrance road east of the kiosk, and are connected by a metal culvert through the road embankment. Wetland 5 is on the north side of the entrance road at the culvert inlet, and Wetland 4 is on the downslope side at the culvert outfall. Both wetlands are depressional pockets with clay pans and surface soil cracks that likely formed after the culvert was installed and the culvert concentrated stormwater flows from the surrounding uplands. Wetland vegetation was dominated by cocklebur, slender-beak sedge, and foxtail barley (*Hordeum jubatum*, FACW). Upland vegetation around the wetlands was dominated by longleaf sage, smooth brome, and crested wheatgrass. Habitat in Wetland 4 and 5 is classified as palustrine emergent persistent temporarily flooded (PEM1A). Primary functions provided by Wetlands 4 and 5 include water quality maintenance (e.g., sediment retention) and hydrologic (e.g., groundwater recharge). These wetlands have low value due to their proximity to the entrance road, low educational/scientific value, and low habitat functions. See Table 3-5 and Table 3-6 for summaries of Wetlands 4 and 5.

WETLAND 4 – INFORMATION SUMMARY					
Location:	South of Scenic Drive, east of entrance kiosk, at toe of road embankment				
Strategy 121	and the second	Size (in study area)	0.01 acre		
And in the second s	Constant and the second and the	FGDC Classification	PEM1A		
		HGM Classification	Depressional		
合的 机中心	A THE PARTY AND	Wetland Data Sheet	DP3-North		
	A MARKED CALLER	Upland Data Sheet	DP4-North		
$p_{i} \in \{1, \dots, n\} \in \{1, \dots, n\}$	A CALL OF THE SECTION	Regulated under the	No, no surface connection		
AND	A REAL PROPERTY AND A REAL	CWA?	to other regulated waters.		
<b>国际任</b> 军公共一部		Delineation Rationale	Satisfies all three wetland		
and the second second	A REAL PROPERTY AND A REAL		criteria.		
Dominant Vegetation	Xanthium strumarium, Carex atl	hrostachya, Hordeum jubatur	n		
Soils	Clay, 10YR 3/2 with redox featu	res and depletions in the upp	er soil profile		
Hydrology	Saturation, Surface soil cracks				
Primary Wetland Function	ons-Values Summary				
Water Quality	Jality Sediment and nutrient retention				
Hydrologic	Groundwater recharge				
Habitat	Low habitat functions due to proximity to road and flashy hydroperiod.				
Values	Low value due to proximity to road and low educational/scientific value.				

#### Table 3-5—Wetland 4 Summary

#### Table 3-6—Wetland 5 Summary

WETLAND 5 – INFORMATION SUMMARY				
Location:	North of Scenic Drive, east of entrance kiosk, at toe of road embankment			
		Size (in study area)	<0.01 acre	
		FGDC Classification	PEM1A	
		HGM Classification	Depressional	
		Wetland Data Sheet	DP3-North	
	the state of the second	Upland Data Sheet	DP4-North	
		Regulated under the CWA?	No, no surface connection to other regulated waters.	
		Delineation Rationale	Satisfies all three wetland criteria.	
Dominant Vegetation	Xanthium strumarium, Horde	um jubatum, Bromus ineri	nis	
Soils	Clay, 10YR 3/2 with redox feature	res and depletions in the upp	er soil profile	
Hydrology	Saturation, Surface soil cracks			
Primary Wetland Function	ons-Values Summary			
Water Quality	Sediment and nutrient retention			
Hydrologic	Groundwater recharge			
Habitat	Low habitat functions due to proximity to road and flashy hydroperiod.			
Values	Low value due to proximity to ro	ad and low educational/scien	tific value.	

Wetland 6 is a ponded depressional wetland in the floodplain of the Little Missouri River and supported by a groundwater seep along its northwestern edge. Concentric rings of vegetation reflect different hydrologic regimes in the wetland. Small pondweed (*Potamogeton pusillus*, OBL) grows in the perennially ponded areas with spikerush, narrow-leaved cattail, and sandbar willow (*Salix interior*, FACW) growing along the outer edges. A small ridge separates Wetland 6 from the OHWM of the Little Missouri River. Depth of ponding appeared to be three to four feet based on the elevation of the outlet and wrack lines. A beaver slide was observed along with evidence of recent beaver browse on the willow stems. A fence crosses through the northwest corner of the wetland but does not appear to restrict beaver movement. Habitat in Wetland 6 is classified as palustrine aquatic bed rooted vascular permanently flooded (PAB3H). Distinct topographic breaks marked transitions to the woodland buffer community consisting of American elm (*Ulmus Americana*, FAC), common juniper (*Juniperus communis*, UPL), wolfberry, wood's rose (*Rosa woodsii*, FACU), leafy spurge (*Euphorbia esula*, NL/UPL), and bluegrass.

Wetland 6 provides a high level of water quality, hydrologic, and habitat functions and values due to its proximity to the Little Missouri River and use by beavers. The ponding provides a unique habitat in the semi-arid landscape. Wetland 6 retains sediment and provides flood storage during high flows in the Little Missouri River, and supports groundwater recharge and benthic macroinvertebrates. Wetland 6 characteristics and functions are summarized in Table 3-7.

WETLAND 6 – INFORMATION SUMMARY					
Location:					
a construction of the	and a March 1997 and 1998	Size (in study area)	0.17 acre		
		FGDC Classification	PAB3H		
		HGM Classification	Depressional		
	and the second sec	Wetland Data Sheet	DP7-North		
		Upland Data Sheet	DP8-North		
		Regulated under the CWA?	Yes, adjacent to TNW.		
		Delineation Rationale	Satisfies all three wetland criteria.		
Dominant Vegetation	Elocharis palustris, Potamog	eton pusillus, Typha angus	stifolia, Salix interior		
Soils	Clay, 10YR 3/2 with redox feature	res and depletions in the upp	er soil profile		
Hydrology	High water table, Saturation, Surface water.				
Primary Wetland Function	ons-Values Summary				
Water Quality	Sediment and nutrient retention, production export, sediment stabilization.				
Hydrologic	Groundwater recharge and discl	Groundwater recharge and discharge, floodflow alteration.			
Habitat	High habitat functions due to beaver presence.				
Values	High value due to uniqueness or	n the landscape and use by w	vildlife.		

# 3.2 Delineated Watercourses and Riparian Buffers

Three watercourses were delineated in the study area, identified in this report and on Figure 6 in Appendix B as Tributary A, Tributary B, and the Little Missouri River. Tributary A flows from north to south through the center of the study area, and confluences with Wetland 1 west of Maintenance Way and north of the employee housing area. It flows through culverts underneath Scenic Drive and Maintenance Way, and backwatering during flood events at the culvert inlets was evidenced by wrack lines approximately five feet above the culvert inlet elevations. Upstream of Maintenance Way, habitat in Tributary A is classified as riverine intermittent streambed seasonally flooded (R4SBC) and flows in a three to five-foot wide low flow channel within a steep-sided ravine. Downstream of Maintenance Way the channel broadens and water velocities decrease, which allows the tributary to aggrade and support the development of wetland vegetation and a step-pool system with intermittent vegetated and ponded areas (Wetland 1C). Wetland 1C transitions back to a fluvial environment and R4SBC habitat as Tributary A flows in a deep ravine with higher velocities towards its confluence with the Little Missouri River. Riparian habitat includes shrub and grasslands in good to moderate condition. Riparian functions are limited by the gravel roads to the well house and maintenance facilities, and Maintenance Way and Scenic Way which are paved. Common woody riparian vegetation included American elm, cottonwood (Populus deltoides, FAC), common juniper, wolfberry, and wood's rose, and grasslands commonly included smooth brome, wheatgrass species, bluegrass, and various forbs. Characteristics of Tributary A are summarized in table 3-8.

#### Table 3-8—Tributary A Summary

TRIBUTARY A - INFORMATION SUMMARY			
Location:	North-south alignment through the cent	ter of the study area	
		Stream Name	Unnamed (Tributary A)
m We	a Stand	FGDC Classification	R4SBC
		USACE Classification	Tributary to TNW (Little Missouri River)
		Flow regime	Intermittent
		Fish Use	No
的现在分		Average Width	3-5'
		Comments	Tributary A flows in a deeply incised ravine. OHW estimated with offsets from top of bluff downstream of Wetland 1C (inaccessible).
	Riparian buffer consists of shrub and grassland habitat in moderately good condition with limited		
Riparian Buffer Condition	evidence of browse and trampling by livestock. Buffer is impacted near road crossings and along the dirt access road near the maintenance facilities and storage yard in the southern portion of the study area.		

Tributary B conveys surface water in an approximate 2-foot wide channel from Wetland 2 to Wetland 1C/Tributary A. The upper portion of Tributary B was excavated as evidenced by the raised berms that parallel it, and transitions to a steep, wooded drainage for approximately 250 feet before confluencing with Wetland 1C/Tributary A. Tributary B is incised with overhanging vegetation on both sides. Habitat in Tributary B is classified as riverine intermittent streambed seasonally flooded excavated (R4SBCx). Riparian habitat is in good condition, and wildlife movement is limited by a fence that parallels the north side of Tributary B. Tributary B characteristics are summarized in Table 3-9.

The Little Missouri River parallels the south side of the study area. It is classified by the USACE as a Traditional Navigable Water (TNW), and habitat classes in the study area include riverine perennial unconsolidated shore temporarily flooded (R2USA) and riverine perennial unconsolidated bottom semipermanently flooded (R2UBF). Steep bluffs greater than 50 feet tall along the left bank near the sewage lagoons and employee housing transition to shorter bluffs and a broader floodplain further upstream to the northwest. Calving from erosion during high flows causes the bluff to occasionally collapse into large clay peds along the shoreline, and provides habitat for willows and other flood tolerant species to establish over time. Sinkholes and slumping were observed at the top of bluff from precipitation infiltrating through seams. Riparian buffer habitat along the bluff area is largely disconnected from the Little Missouri River due to the elevational differences, and vegetation communities are impacted by the sewage lagoons, materials storage, and routine mowing at the top of bluff. Riparian vegetation is in good condition north of the employee housing area and was not disturbed. Little Missouri River characteristics within the study area are summarized in Table 3-10

#### Table 3-9—Tributary B Summary

TRIBUTARY B - INFORMATION SUMMARY			
Location:	In the southern portion of the study are	a east of the maintenance build	dings
		Stream Name	Unnamed (Tributary B)
		FGDC Classification	R4SBCx
		USACE Classification	Tributary to TNW (Little Missouri River)
	Contraction of the second	Flow regime	Intermittent
		Fish Use	No
		Average Width	2'
		Comments	Tributary B conveys surface water from Wetland 2 to Wetland 1C/Tributary A during heavy precipitation events. Partially excavated with overhanging vegetation.
Riparian Buffer	Riparian buffer consists of shrub and g		
Condition	browse and trampling by livestock. Wildlife movement is limited by a fence north of Tributary B.		

#### Table 3-10—Little Missouri River Summary

LITTLE MISSOURI RIVER - INFORMATION SUMMARY			
Location:	Along southwestern and southern study area boundary		
		Stream Name	Little Missouri River
		Cowardin Classification	R2USA, R2UBF
		USACE Classification	TNW
	Flow regime	Perennial	
The star		Fish Use	Yes
Converting of the second		Average Width	200-400'
		Comments	OHW estimated using offsets from top of bluff south of the employee housing area.
Riparian Buffer Condition	I partially impacted by sewade ladoons, material storade, and redular mowind at the top of the		

# 3.3 Sensitive Plants, Fish, and Wildlife

North Dakota has twelve species listed as threatened or endangered under the federal ESA of 1973. North Dakota does not have a separate state endangered or threatened species list. Only those species listed under the ESA are considered threatened or endangered in North Dakota (NDGFD 2020a). The USFWS administers and implements protections under the ESA in North Dakota. The USFWS Information, Planning and Consultation (IPAC) system lists seven species potentially occurring in the study area of the North Unit: northern long-eared bat (*Myotis septentrionalis*, Threatened), least tern (*Sterna antillarum*, Endangered), piping plover (*Charadrius melodus*, Threatened), red knot (*Calidris canutus rufa*, Threatened), whooping crane (*Grus Americana*, Endangered), pallid sturgeon (*Scaphirhynchus albus*, Endangered), and Dakota skipper (*Hesperia dacotae*, Threatened) (USFWS 2020a). The potential presence of these species in the study area will be evaluated in coordination with the USFWS during development of the Environmental Assessment for compliance with NEPA and ESA. Designated critical habitat for these species does not occur within the study area.

# 3.4 CWA Jurisdictional Assessment

Wetlands and watercourses in the study area are potentially regulated by the USACE under the CWA. The definition of WOTUS was recently updated on June 22, 2020 under the Navigable Waters Protection Rule. The Little Missouri River is classified as a Traditional Navigable Water and is a jurisdictional water. Both Tributary A and Tributary B have surface water connections to the Little Missouri River and are assumed to be jurisdictional. Wetlands 1, 2, 3, and 6 are classified as associated wetlands and are assumed to be jurisdictional. Wetlands 4 and 5 do not have a surface water connection either tributary or the associated wetlands, and therefore is assumed to be non-jurisdictional under the CWA.

# Chapter 4. Existing Conditions – South Unit

Three wetlands and five watercourses were identified and delineated in the South Unit study area as shown on Figure 7 in Appendix B. Wetland determination data forms are provided in Appendix C. Wetlands and streams characteristics are summarized in Tables 4-1 to 4-9.

Resource <sup>1</sup>	Class	ification	Size/Length in Study Area		Comments	
Resource	Cowardin <sup>2</sup>	HGM	Acre	Linear Feet	Comments	
Wetland 1	PFO1A	Depressional	0.11	-	Supported by stormwater discharges from visitor center parking lot	
Wetland 2	PUBJx	Depressional	0.04	-	Artificial; excavated pond for sediment management	
Wetland 3	PEM1A	Slope	0.01	-	Artificial; drainage ditch with stormwater outfalls	
Tributary A	R4SBA	-	-	~1,035	Ephemeral; concentrated flows from hillside following storm events; dissipates in alluvial fan	
Tributary B	R4SBCr, R4SBCx	-	-	~1,959	Concrete-lined channel in town, transitions to excavated channel after Main St.	
Tributary C	R4SBA	-	-	~75	Ephemeral, groundwater seeps, dissipates in alluvial fan	
Tributary D	R4SBA	-	-	~80	Ephemeral, groundwater seeps, dissipates in alluvial fan	
Little Missouri River	R2USA, R2UBF	-	-	~1,350	OHW located west of broad floodplain bench and floodplain forest	

Table 4-1—Delineated	Wetlands and	l Streams – South Uni	t
			•

Note:

1. Wetlands and streams shown on Figure 7 in Appendix B.

2. FGDC/Cowardin classes: PFO1A = Palustrine forested broad-leaved deciduous temporarily flooded; PUBJx = Palustrine unconsolidated bottom intermittently flooded excavated; PEM1A = Palustrine emergent persistent temporarily flooded; R4SBC = Riverine intermittent streambed seasonally flooded; R4SBCr = Riverine intermittent streambed seasonally flooded artificial substrate; R4SBCx = Riverine intermittent streambed seasonally flooded; R2USA = Riverine perennial unconsolidated bottom semi-permanently flooded; R2USA = Riverine

# 4.1 Delineated Wetlands and Functions Evaluation

Three wetlands were delineated in the South Unit study area identified on Figure 7 in Appendix B as Wetlands 1, 2, and 3. Wetland 1 is a depressional wetland located at the outlet of a stormwater pipe along the north side of the Visitor Center parking lot. Wetland 1 does not have a surface connection to any other wetlands or watercourses, and is located in the mapped 100-year floodplain of the Little Missouri River. Groundwater was observed at five inches below ground surface, and surface water was observed in the linear depression extending from the outfall that overflowed into a depressional pocket. Hydric soil indicators included depleted matrices below dark surfaces.

Habitat in Wetland 1 is classified as palustrine forested broad-leaved deciduous temporarily flooded (PFO1A). Dominant vegetation included eastern cottonwood and green ash (*Fraxinus pennsylvanica*, FAC) trees and saplings, red-twig dogwood (*Cornus sericea*, FACW), fowl bluegrass (*Poa palustris*, FACW), and an unidentified sedge (*Carex* sp., FACW or wetter). The sedge species was not identifiable in the field because a seed head was not found. It was assumed to be rated FACW or wetter due its establishment in saturated soil conditions and ponded areas. Upland vegetation also included eastern cottonwood and green ash trees and saplings, but also

included species typical of uplands including wolfberry and smooth brome. Soil profiles also transitioned to bright matrices (2.5Y 4/3 and 5/3) and were dry.

Primary functions provided by Wetland 1 include water quality maintenance (e.g., sediment/toxicant retention, nutrient removal), hydrologic (e.g., groundwater recharge, flood storage), and wildlife habitat. Wetland 1 receives stormwater from the Visitor Center parking lot and East River Road, and retains sediment and pollutants without discharging to other surface waters. Wetland 1 provides wildlife habitat diversity in the semi-arid landscape, but its functions are limited due to its proximity to the Visitor Center and parking lot. Wetland 1 has moderate value due to the stormwater treatment it provides, and the visual quality and aesthetics provided by its adjacency to the Visitor Center and Theodore Roosevelt's cabin. Wetland 1 characteristics are summarized in Table 4-2.

WETLAND 1 – INFORMATION SUMMARY				
Location:	North of Visitor Center and parking lot and east of Theodore Roosevelt's cabin			
		Size (in study area)	>0.11 acre	
THE COL		FGDC Classification	PFO1A	
		HGM Classification	Depressional	
	ALASSO	Wetland Data Sheet	DP1-South	
		Upland Data Sheet	DP2-South	
		Regulated under the CWA?	No, in mapped floodplain of Little Missouri River but not inundated in a typical water year.	
		Delineation Rationale	Satisfies all three wetland criteria.	
Dominant Vegetation	Fraxinus pennsylvanica, Populu	s deltoides, Cornus sericea, Pc	pa palustris, Carex sp.	
Soils	Clay; 10YR 3/2 and 4/2 with red	ox features and depletions		
Hydrology	Surface water, High water table,	Saturation.		
Primary Wetland Function	ons-Values Summary			
Water Quality	Sediment and toxicant retention, nutrient removal.			
Hydrologic	Flood storage, groundwater recharge.			
Habitat	Provides habitat diversity and bu	Provides habitat diversity and but limited by adjacent development.		
Values		Stormwater treatment and visual quality/aesthetics because Wetland 1 is visible from the Visitor Center and surrounding area.		

#### Table 4-2—Wetland 1 Summary

Wetland 2 is a ponded, depressional wetland excavated in uplands to capture and retain sediment from eroding hillsides and nearby draws. A low berm and excavated swale have been constructed to direct surface flows from heavy precipitation events into the pond. Wetland 2 functions as a sediment basin to capture the clay fines so they do not enter the concrete lined channel (Tributary B in this report) that flows through the City of Medina. Highly erodible soils were observed in the draw and drainage pathway but no OHW was observed that would make it a jurisdictional feature. The end of the swale is lined with concrete and buried under approximately two inches of sediment. Vegetation in the swale was dominated by upland plants such as smooth brome. Wetland 2 is surrounded by a stand of eastern cottonwood trees and is enclosed by fencing. Vegetation was not observed growing in the pond. Primary functions provided by Wetland 2 include sediment retention and flood storage

because it retains stormwater runoff from the hillsides upslope. It is moderately valuable as a sediment basin for maintaining city infrastructure. Wetland 2 characteristics and functions are summarized in Table 4-3.

WETLAND 2 – INFORMATION SUMMARY				
Location:	East of town near the east end of Second Avenue			
		Size (in study area)	0.04 acre	
		FGDC Classification	PUBJx	
		HGM Classification	Depressional	
		Wetland Data Sheet	-	
		Upland Data Sheet	-	
		Regulated under the CWA?	No, excavated wholly in uplands for the purpose of stormwater management.	
		Delineation Rationale	Meets FGDC mapping standard.	
Dominant Vegetation	Populus deltoides, Bromus inerr	nis		
Soils	Mud			
Hydrology	Surface water			
Primary Wetland Function	ons-Values Summary			
Water Quality	Sediment retention.			
Hydrologic	Floodflow alteration.			
Habitat	Low habitat value due to periodic maintenance, fencing, and sediment-laden water.			
Values	Moderate societal value to minimize maintenance of concrete conveyance through town.			

#### Table 4-3—Wetland 2 Summary

Wetland 3 is a roadside ditch artificially constructed in uplands adjacent to the east side of East River Road and north of 3<sup>rd</sup> Avenue. A stormwater pipe north of 3<sup>rd</sup> Avenue discharges stormwater collected from Pacific Avenue and the surrounding developed area. Stormwater flows north through Wetland 3 and discharges to Tributary B, which flows through two culverts underneath East River Road. Vegetation in Wetland 3 is dominated by green ash saplings and bluegrass that appeared to be mowed periodically. Soil profiles were characterized by dark surfaces with redoximorphic concentrations and depletions in the top twelve inches. Soils were saturated during the time of the site investigation. The primary function of Wetland 3 is for stormwater treatment to retain sediment and toxicants and remove nutrients. Habitat in Wetland 3 is classified as palustrine emergent persistent temporarily flooded. Wetland 3 is classified as slope in the HGM system, and its characteristics and functions are summarized in Table 4-4.

#### Table 4-4—Wetland 3 Summary

WETLAND 3 – INFORMATION SUMMARY				
Location:	At the northeast corner of the East River Road and 3rd Avenue intersection			
		Size (in study area)	0.01 acre	
		FGDC Classification	PEM1A	
		HGM Classification	Slope	
X		Wetland Data Sheet	-	
	A Part La	Upland Data Sheet	-	
		Regulated under the CWA?	No, ditches constructed in uplands are not WOTUS.	
	Delineation Rationale	Presence of hydric soils and wetland hydrology with disturbed vegetation community.		
Dominant Vegetation	Fraxinus pennsylvanica, Poa pra	atensis		
Soils	Loam; 10YR 2/1 with redox featu	ures (10YR 5/6) and depletions	s (10YR 4/1)	
Hydrology	High water table, Saturation.			
Primary Wetland Functions-Values Summary				
Water Quality	Sediment and toxicant retention, and nutrient removal.			
Hydrologic	Floodflow alteration, groundwater recharge.			
Habitat	Low wildlife functions due to adjacent roads and regular vegetation maintenance.			
Values	Moderate societal value to treat	stormwater runoff and improve	water quality.	

# 4.2 Delineated Watercourses and Riparian Buffers

Five watercourses were delineated in the study area, identified in this report and on Figure 7 in Appendix B as Tributary A, Tributary B, Tributary C, Tributary D, and the Little Missouri River. Tributary A emanates from the hillsides east of the NPS maintenance facilities area and flows through a culvert underneath East River Road. Surface flows disperse onto an alluvial fan west of East River Road approximately 1,400 linear feet from the bank of the Little Missouri River. A berm and grass swale constructed parallel to the maintenance yard at the base of the hillside concentrates surface water runoff during precipitation events and conveys it north. Dominant vegetation the swale included plants typical of uplands such as smooth brome, leafy spurge, Canada thistle, cheatgrass (*Bromus tectorum*, NL/UPL), and big sagebrush (*Artemisia tridentata*, NL/UPL). A defined channel with an OHWM develops towards the northern end of the swale and confluences with an ephemeral stream flowing west out of a draw as shown on Figure 7 in Appendix B. Tributary A is incised and approximately two to three feet wide. Habitat in Tributary A is classified as riverine intermittent streambed temporarily flooded (R4SBA). Riparian habitat is in good to moderate condition but also limited by the entrance road to the maintenance facility. Common riparian vegetation included eastern cottonwood, serviceberry (*Amelanchier alnifolia*, FACU), sagebrush, and smooth brome. Tributary A characteristics are summarized in Table 4-5.

#### Table 4-5—Tributary A Summary

TRIBUTARY	A - INFORMATION SUMMA	RY		
Location:	North-south alignment through	the center of the study area		
	All Constants	Stream Name	Unnamed (Tributary A)	
in theme is		FGDC Classification	R4SBA	
		USACE Classification	Not regulated, no surface connection to a WOTUS.	
		Flow regime	Ephemeral	
合效影响		Fish Use	No	
	and the second	Average Width	2-3'	
		Comments	Tributary A flows in an incised channel in response to precipitation events; substrate is dominated by eroded clay fines.	
Riparian Buffer		ub and grassland habitat in moderate		
Condition	impacted near the East River	impacted near the East River Road crossing and entrance drive to the maintenance facilities.		

Tributary B begins along the east side of Fourth Street between 2<sup>nd</sup> Avenue and 3<sup>rd</sup> Avenue, and flows in an approximately 4 foot-wide concrete channel west toward the Little Missouri River. The concrete channel ends west of Main Street and transitions to a five-foot wide excavated channel with a natural substrate. Tributary B then flows through a double culvert underneath East River Road and west of the Visitor Center to the north and northwest. Floodgates have been installed on the double culverts to prevent floodwaters from the Little Missouri River entering the City of Medora during high flow events. Tributary B flows through a narrow, forested riparian corridor around Chimney Park and then infiltrates in sandy soils on a floodplain terrace approximately 100 feet east of the Little Missouri River. Forested riparian vegetation included green ash, eastern cottonwood, woods rose, wolfberry, red-twig dogwood, and willows along the forest edges. Habitat in Tributary B is classified as riverine intermittent streambed seasonally flooded artificial substrate (R4SBCr) and excavated (R4SBCx). Tributary B characteristics are summarized in Table 4-6.

Tributary C and Tributary D are ephemeral drainages in eroded bluffs that receive surface water runoff and groundwater seeps emanating from coal seams in incised ravines. Surface water in both tributaries disperses onto alluvial fans consisting of clay fines, and infiltrates east of the Little Missouri River. Both channels are approximately one-foot wide. The groundwater seeps cause the ravine sides to slump and erode over time. Riparian vegetation along the channels included big sagebrush, rabbitbrush (*Chrysothamnus nauseosus*, NL/UPL), saltgrass, and smooth brome. Habitat in Tributaries C and D is classified as riverine intermittent streambed temporarily flooded (R4SBA). Surface water was flowing at the time of the site visit. Tributary C and D characteristics are summarized in Table 4-7 and Table 4-8.

#### Table 4-6—Tributary B Summary

TRIBUTARY B - INFORMATION SUMMARY			
Location:	Center of town and west of East River Road		
		Stream Name	Unnamed (Tributary B)
		FGDC Classification	R4SBCr, R4SBCx
		USACE Classification	Tributary to TNW (Little Missouri River)
are shared and the	Flow regime	Intermittent	
The second	CAR	Fish Use	No
		Average Width	3-6'
		Comments	Tributary B flows in a concrete channel through town and then in a straightened channel around Chimney Park.
Riparian Buffer	Riparian buffer is minimal through town then transitions to a narrow forest corridor with adjacent		
Condition	maintained lawn areas around Chimney Park.		

#### Table 4-7—Tributary C Summary

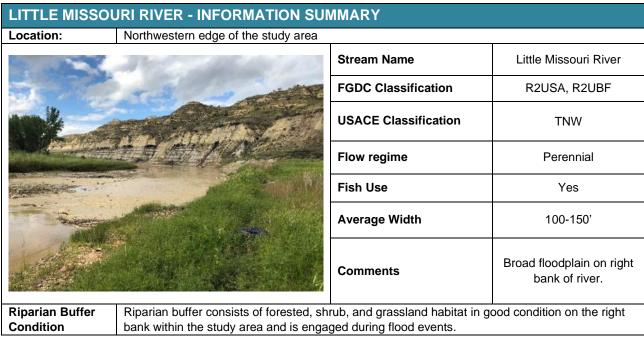
TRIBUTARY C - INFORMATION SUMMARY			
Location:	Northwest portion of study area between East River Road and the Little Missouri River		
NE	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Stream Name	Unnamed (Tributary C)
	A VI	FGDC Classification	R4SBA
	USACE Classification	No, has an ephemeral flow regime with no surface water connection to other WOTUS.	
Carton State		Flow regime	Ephemeral
		Fish Use	No
	- X. V	Average Width	1-2'
		Comments	Tributary C flows in an incised ravine then dissipates on an alluvial fan of clay fines.
Riparian Buffer	Riparian buffer is limited by steep slopes within the ravine. Riparian shrub and herbaceous		
Condition	vegetation primarily functions to stabilize eroding soils.		

#### Table 4-8—Tributary D Summary

TRIBUTARY D - INFORMATION SUMMARY			
Location:	Northwest portion of study area between East River Road and the Little Missouri River		
<b>BB</b>		Stream Name	Unnamed (Tributary D)
		FGDC Classification	R4SBA
		USACE Classification	No, has an ephemeral flow regime with no surface water connection to other WOTUS.
	Flow regime	Ephemeral	
	Fish Use	No	
		Average Width	1-2'
	Comments	Tributary D flows in an incised ravine then dissipates on an alluvial fan of clay fines.	
Riparian Buffer	Riparian buffer is limited by steep slopes within the ravine. Riparian shrub and herbaceous		
Condition	vegetation primarily functions to stabilize eroding soils.		

The Little Missouri River parallels the northwestern edge of the study area for approximately 1,350 feet. It is classified by the USACE as a TNW, and habitat classes in the study area include riverine perennial unconsolidated shore temporarily flooded (R2USA) and riverine perennial unconsolidated bottom semipermanently flooded (R2UBF). The OHWM was based on evidence of scour, bed and banks, gravel sorting, and the presence of floodplain terraces along the right bank that supported plants tolerant of saturated soil conditions versus upland plants. Herbaceous plants below the OHWM included prairie cordgrass, three-square, and spike-rush, and plants above the OHWM included wild licorice (*Glycyrrhiza lepidota*, FACU), sweet clover, showy milkweed (*Asclepias speciosa*, FAC), leafy spurge, and smooth brome. Soil profiles on the floodplain terraces above the OHWM had bright matrices (10YR 3/3 and 4/3) and sandy texture. Riparian vegetation also included a row of eastern cottonwood trees that paralleled the river approximately 100 to 150 feet to the east. Evidence of recent beaver browse was also observed. Little Missouri River characteristics within the study area are summarized in Table 4-9.

#### Table 4-9—Little Missouri River Summary



### 4.3 Sensitive Plants, Fish, and Wildlife

North Dakota has twelve species listed as threatened or endangered under the federal ESA of 1973. North Dakota does not have a separate state endangered or threatened species list. Only those species listed under the ESA are considered threatened or endangered in North Dakota (NDGFD 2020). The USFWS administers and implements protections under the ESA in North Dakota. The USFWS IPAC system lists seven species potentially occurring in the study area of the North Unit: northern long-eared bat (Threatened) and whooping crane (Endangered) (USFWS 2020a). The potential presence of these species in the study area will be evaluated in coordination with the USFWS during development of the Environmental Assessment for compliance with NEPA and ESA. Designated critical habitat for these species does not occur within the study area.

# 4.4 Regulatory Summary

Wetlands and watercourses in the study area are potentially regulated by the USACE under the CWA. The definition of WOTUS was recently updated on June 22, 2020 under the Navigable Waters Protection Rule. The Little Missouri River is classified as a Traditional Navigable Water and is a jurisdictional water. Tributaries A, C, and D have ephemeral flow regimes with no surface water or clear ground water connection to other WOTUS, and therefore are assumed to be not regulated under the CWA. Tributary B has an intermittent flow regime with a clear groundwater connection to the Little Missouri River, and is assumed to be jurisdictional. Wetland 1 does not have a surface water connection to a regulated tributary or other WOTUS, and therefore is assumed to be non-jurisdictional. Wetland 3 are artificial stormwater features constructed in uplands, and therefore are assumed to be non-jurisdictional under the CWA.

# Chapter 5. References

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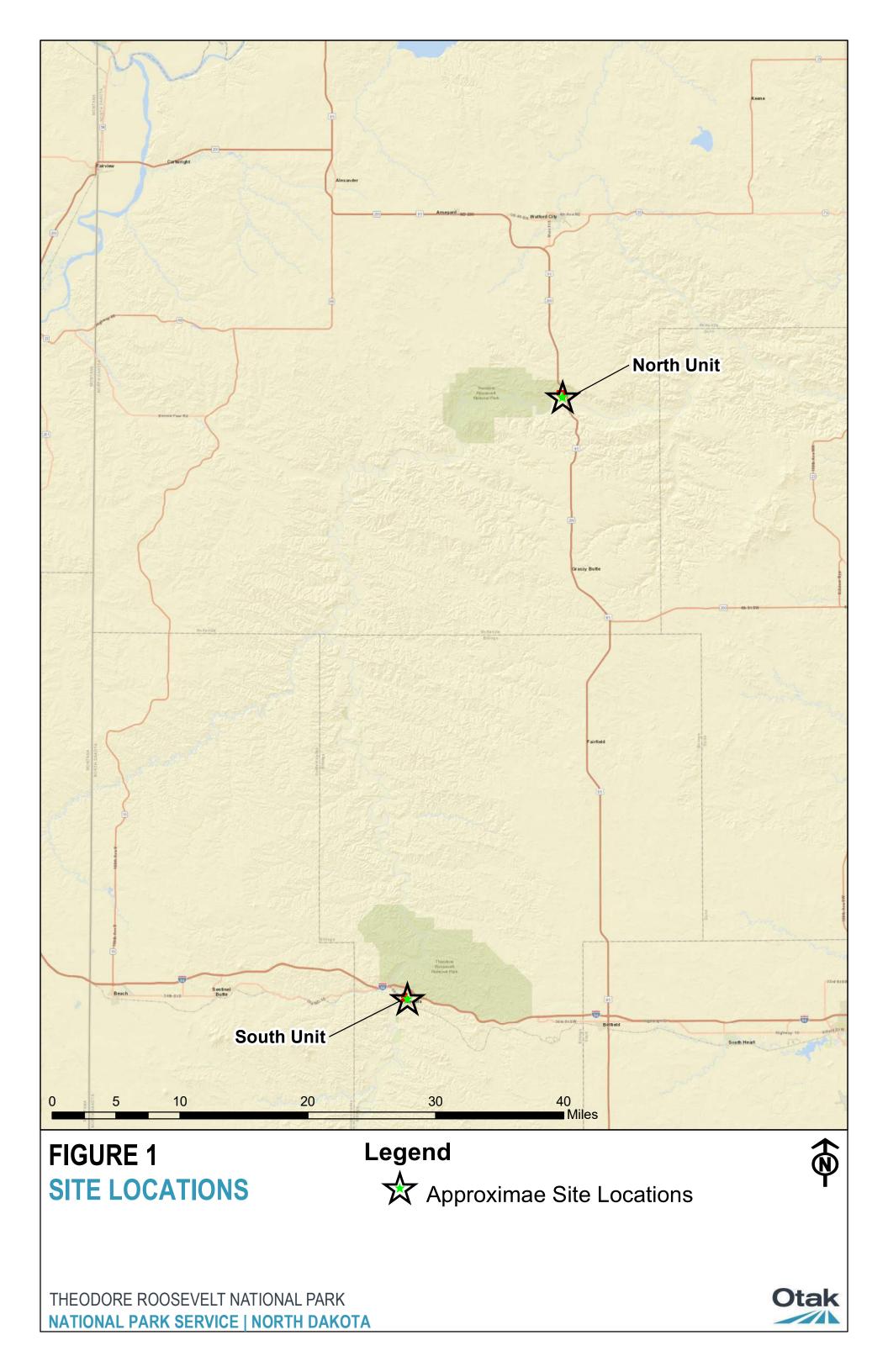
Parameter	Method or Tool	Website	Reference
Wetland Delineation	Corps of Engineers Wetlands Delineation Manual	http://el.erdc.usace.army.mi l/elpubs/pdf/wlman87.pdf	U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetland Delineation Manuel. Environmental Laboratory Wetlands Research Program Technical Report Y-87-1, U.S. Army Corps of Engineers, Engineer Waterways Experiment Station, Vicksburg, Mississippi.
	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: GPR	https://www.usace.army.mil /Missions/Civil- Works/Regulatory- Program-and- Permits/reg_supp/	U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J.S. Wakely, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
Wetland Classification	FGDC	https://www.fgdc.gov/stand ards/projects/wetlands/nwc s-2013	Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.
	Hydrogeomorphic Classification (HGM) System	http://el.erdc.usace.army.mi l/wetlands/pdfs/wrpde4.pdf	Brinson, M. M. 1993. "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A270 053.
Wetland Functions Assessment	The Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach	https://www.nae.usace.arm y.mil/Portals/74/docs/regula tory/Forms/HighwaySupple ment6Apr2015.pdf	<b>U.S. Army Corps of Engineers. 1999.</b> The Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach. NAEEP-360-1-30a.
Stream Delineation	OHWM	http://www.usace.army.mil/ Portals/2/docs/civilworks/re gulatory/cwa_guide/app_h_ rgl05-05.pdf	<b>U.S. Army Corps of Engineers</b> . Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification.
	OHWM	http://www.ecfr.gov/cgi- bin/text- idx?tpl=/ecfrbrowse/Title33/ 33cfr328_main_02.tpl	Congressional Federal Register 33 Part 328 Definition of Waters of the United States.
Wetland Indicator Status	GPR 2018 Regional Wetland Plant List	http://wetland- plants.usace.army.mil/nwpl _static/v34/home/home.htm I	<b>U.S. Army Corps of Engineers. 2018.</b> National Wetland Plant List, Version 3.4. Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.
Plant Names	USDA PLANTS Database	http://plants.usda.gov/	<b>USDA, NRCS. 2016</b> . The PLANTS Database. National Plant Data Team, Greensboro, NC 27401-4901 USA.

### Table A-1—Methods and Tools Used to Prepare the Report

Parameter	Method or Tool	Website	Reference
Soils Data	Soil Survey	Web Soil Survey: http://websoilsurvey.nrcs.us da.gov/app/WebSoilSurvey .aspx	Website
Threatened and Endangered Species	USFWS IPAC species lists	https://ecos.fws.gov/ipac/	Website

This appendix includes:

- Figure 1: Site Locations Map
- Figure 2: NWI North Unit
- Figure 3: NWI South unit
- Figure 4: USGS Topography Map North Unit
- Figure 5: USGS Topography Map South Unit
- Figure 6: Wetlands and Streams North Unit
- Figure 7: Wetlands and Streams South Unit





# FIGURE 3 SOUTH UNIT NWI MAP

THEODORE ROOSEVELT NATIONAL PARK NATIONAL PARK SERVICE | NORTH DAKOTA

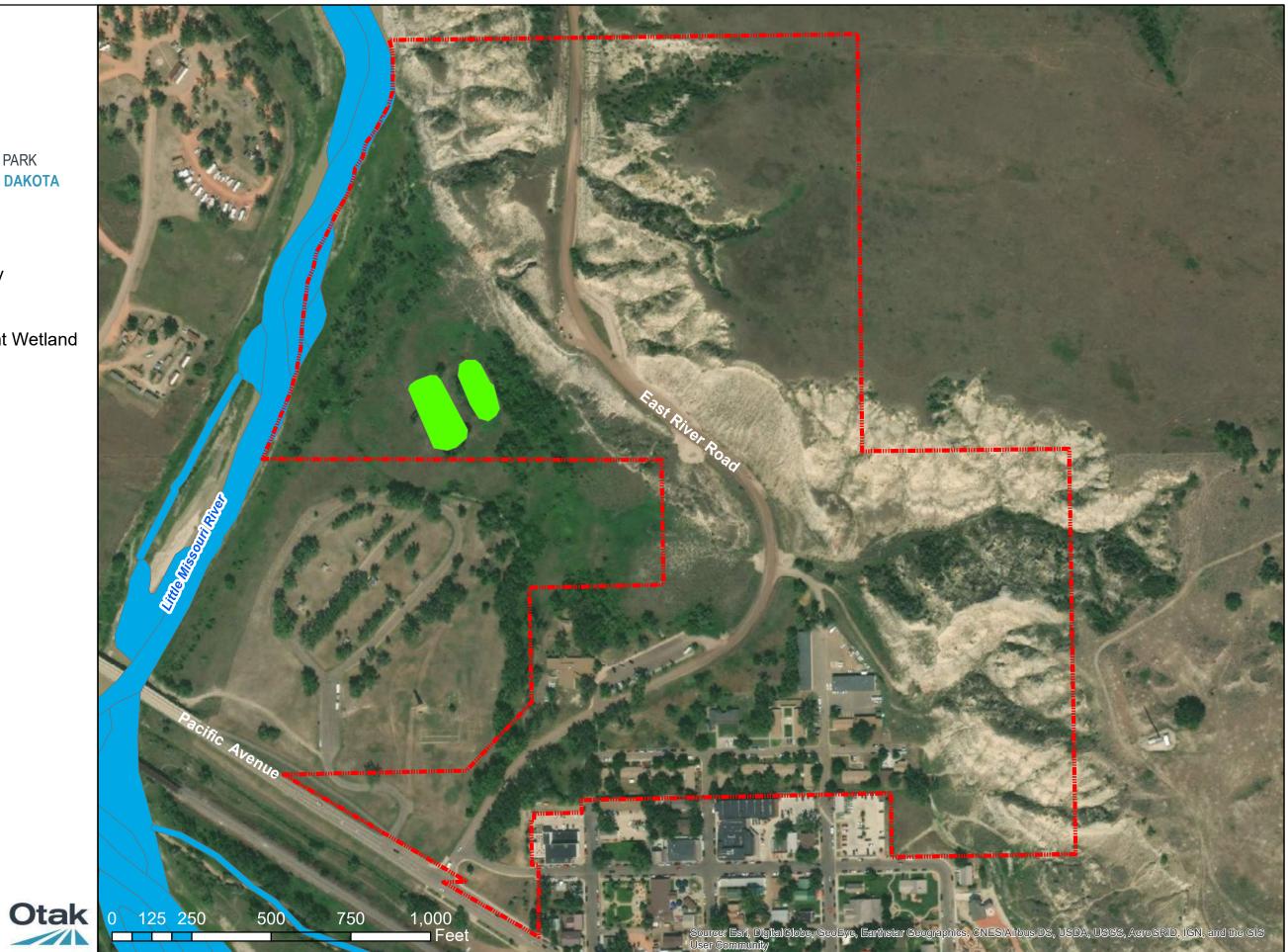
# Legend

Study Area Boundary

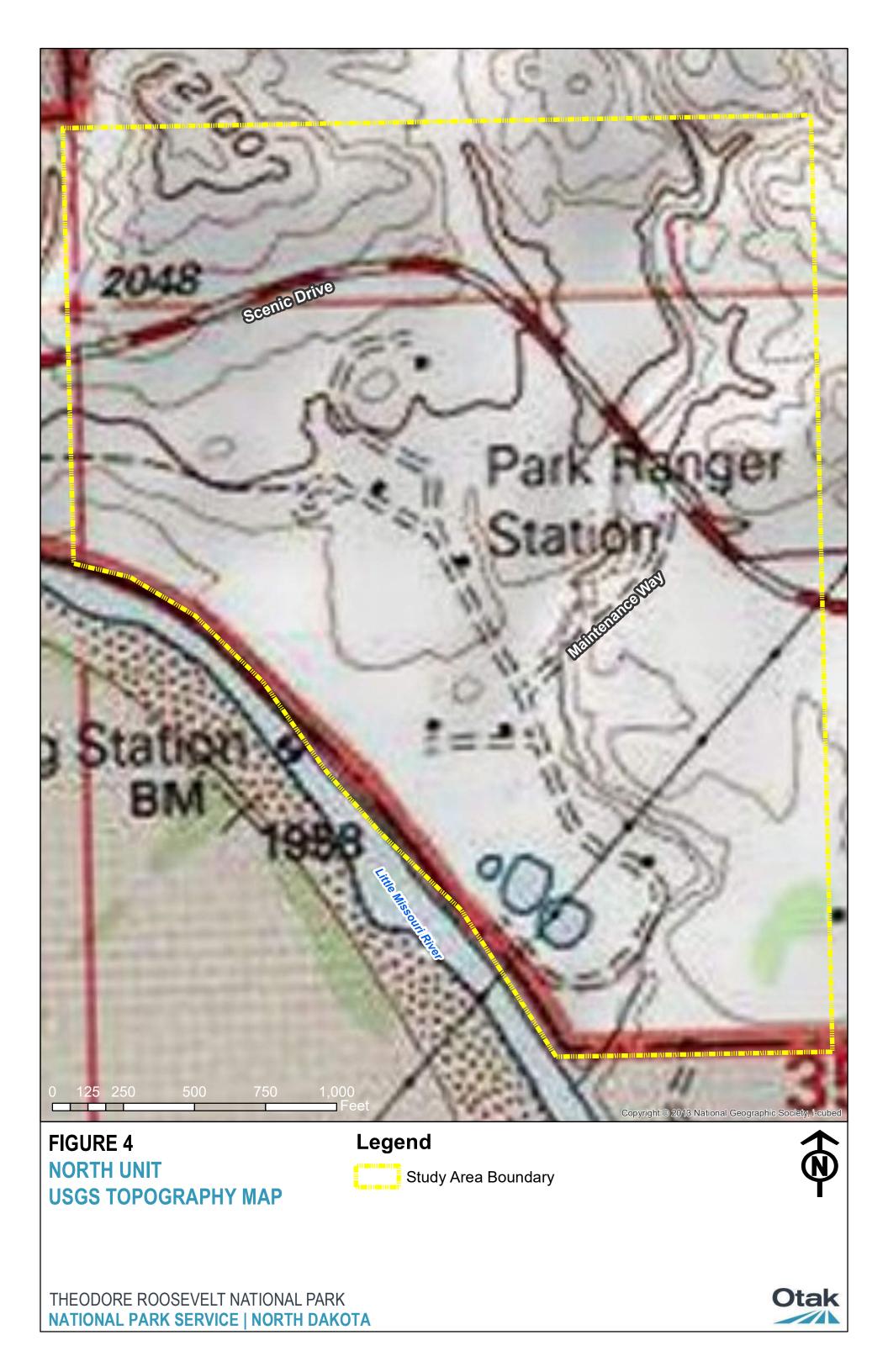
# Habitat Type

Freshwater Emergent Wetland

Riverine







### **FIGURE 5 SOUTH UNIT USGS TOPOGRAPHY MAP**

THEODORE ROOSEVELT NATIONAL PARK NATIONAL PARK SERVICE | NORTH DAKOTA



Study Area Boundary





Wetland 1A

Tributary A

Scenic Drive

Wetland 6

Wetland 1B-

Wetland 5

Wetland 4

**Wetland 3** 

DP3/ DP4

Wetland 2

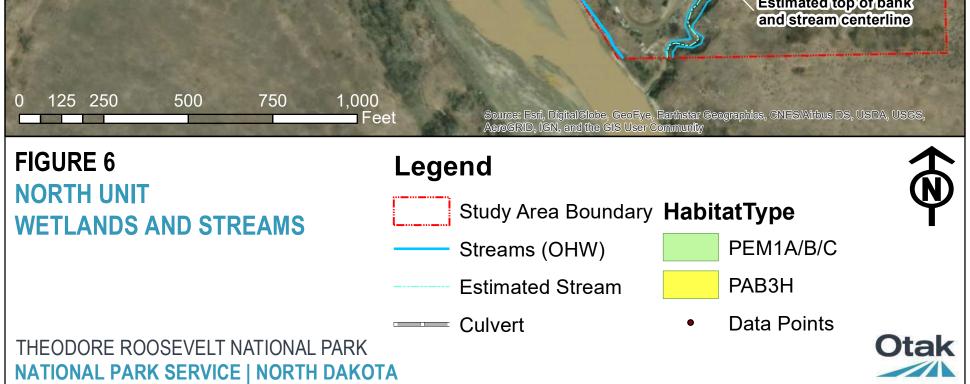
DP2

DP1

**Tributary** B

**Tributary**A

Estimated top of bank



Wetland 1C

### FIGURE 7 SOUTH UNIT WETLANDS AND STREAMS

THEODORE ROOSEVELT NATIONAL PARK NATIONAL PARK SERVICE | NORTH DAKOTA

### Legend

Study Area Boundary
Streams (OHW)
Estimated Stream
Data Points

Wetland Habitat

PFO1A
PEM1A
PUBJx



Project/Site: THRO - North Unit	City/County:	-/McKenzie	Sampling Date: 7/21/20				
Applicant/Owner: <u>NPS</u>		State: ND	Sampling Point: DP1 - North				
Investigator(s): <u>Jeff Gray</u>	Section, Tow	nship, Range: <u>S35, T148N, R099</u> W	1				
		concave, convex, none): <u>concave</u>					
Subregion (LRR): LRR G Lat:	47.597652	Long: -103.259020	Datum: WGS 84				
Soil Map Unit Name: Cabbart-Badland complex, 6 to 70 percent slo	ation: <u>No</u>						
Are climatic / hydrologic conditions on the site typical for this time of	of year? Yes	No (If no, explain in R	emarks.)				
Are Vegetation, Soil, or Hydrology significa	antly disturbed?	Are "Normal Circumstances" p	oresent? Yes X No				
Are Vegetation, Soil, or Hydrology naturally	y problematic?	(If needed, explain any answe	rs in Remarks.)				
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.							
Hydrophytic Vegetation Present? Yes X No	Is the	Sampled Area					

Hydrophytic Vegetation Present? Hydric Soil Present?	Yes <u>X</u> Yes <u>X</u>	No No	Is the Sampled Area	Nog X	Na		
Wetland Hydrology Present?	Yes X	No	within a Wetland?	Yes X	No		
Remarks:							
DP-1 North located in Wetland 2 in sloping salt flat. All three wetland indicators present.							

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' d.</u> )	% Cover	Species?	Status	Number of Dominant Species
1. <u>-</u>				That Are OBL, FACW, or FAC
2				(excluding FAC-): $1$ (A)
3				Total Number of Dominant
4				Species Across All Strata: <u>1</u> (B)
		= Total Co		
Sapling/Shrub Stratum (Plot size: 15' d. )				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
1. <u>-</u>				
2				Prevalence Index worksheet:
				Total % Cover of:Multiply by:
3				OBL species x 1 =
4				FACW species x 2 =
5				FAC species x 3 =
5'd	0	= Total Cov	/er	
Herb Stratum (Plot size: 5' d. )	75	Vee		FACU species x 4 =
1. Puccinellia nutalliana	75	Yes	OBL	UPL species x 5 =
2. <u>Stipa sp.</u>	2	No	NL	Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
				X 2 - Dominance Test is >50%
7				3 - Prevalence Index is ≤3.0 <sup>1</sup>
8				4 - Morphological Adaptations <sup>1</sup> (Provide supporting
9				data in Remarks or on a separate sheet)
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
15'd	77	= Total Cov	/er	
Woody Vine Stratum (Plot size: 15' d. )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1				
2				Hydrophytic
	0	= Total Co	/er	Vegetation
% Bare Ground in Herb Stratum 23 (salt flat)				Present? Yes X No
Remarks:				
Hydrophytic vegetation indicator prese	nt.			

SOIL	S	0		
------	---	---	--	--

Depth	ription: (Describe Matrix	to the dep	oth needed to docur Redo	ment the		or confir	m the absence	of indicators.)
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-16	10YR 3/2	50	10YR 4/1	6	d	m	silty clay	dense, concentrations to surface
	10YR 3/1	40	10YR 5/6	4	с	m		
						·		
						·		
						·		
1 <u>т о о</u>								
			=Reduced Matrix, C			ed Sand (		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils <sup>3</sup> :
-		cable to all	LRRs, unless othe					•
<u> </u>	(AT) vipedon (A2)			Redox (S	latrix (S4)			/luck (A9) ( <b>LRR I, J</b> ) Prairie Redox (A16) ( <b>LRR F, G, H</b> )
Black His			-	d Matrix (				Surface (S7) (LRR $G$ )
	n Sulfide (A4)				lineral (F1)			Plains Depressions (F16)
	Layers (A5) (LRR	F)		-	/atrix (F2)		-	RR H outside of MLRA 72 & 73)
1 cm Mu	ck (A9) ( <b>LRR F, G</b> ,	H)	Deplete	ed Matrix	(F3)		Reduc	ed Vertic (F18)
·	Below Dark Surfac	ce (A11)	X Redox	Dark Sur	face (F6)			arent Material (TF2)
	rk Surface (A12)				Surface (F7	)		Shallow Dark Surface (TF12)
	lucky Mineral (S1)			Depressi		10)		(Explain in Remarks)
	lucky Peat or Peat cky Peat or Peat (S				ressions (F • <b>73 of LRF</b>			of hydrophytic vegetation and d hydrology must be present,
	cky real of real (S	55) ( <b>LKK</b> F)		.NA / 2 0		хп)		disturbed or problematic.
Restrictive L	ayer (if present):							
Type: _								
Depth (inc	ches): -						Hydric Soil	Present? Yes X No
Remarks:	,						,	
Hydric so	oil indicator F	6 (redo	x dark surface	e) obs	erved.			
HYDROLO	GY							
Wetland Hyd	drology Indicators	:						
Primary Indic	ators (minimum of o	one require	d; check all that app	ly)			Seconda	ary Indicators (minimum of two required)
X Surface	Water (A1)		X Salt Crust	(B11)			Sur	face Soil Cracks (B6)
X High Wa	ter Table (A2)		Aquatic In	vertebrat	es (B13)		Spa	rsely Vegetated Concave Surface (B8)
X Saturatio	on (A3)		Hydrogen	Sulfide C	Odor (C1)		Dra	inage Patterns (B10)
Water M	arks (B1)		Dry-Sease	on Water	Table (C2	)	Oxio	dized Rhizospheres on Living Roots (C3)
Sedimen	t Deposits (B2)		Oxidized I	Rhizosph	eres on Liv	ing Roots	s (C3) ( <b>v</b>	vhere tilled)
Drift Dep	oosits (B3)		(where	not tilled	I)		Cra	yfish Burrows (C8)
Algal Ma	t or Crust (B4)		Presence	of Reduc	ed Iron (C	4)	Sati	uration Visible on Aerial Imagery (C9)
Iron Dep	osits (B5)		Thin Mucł	Surface	(C7)		Geo	omorphic Position (D2)
Inundatio	on Visible on Aerial	Imagery (B	7) Other (Ex	plain in R	lemarks)		FAC	C-Neutral Test (D5)
Water-St	tained Leaves (B9)						Fros	st-Heave Hummocks (D7) (LRR F)
Field Observ				_				
Surface Wate	er Present?	res X	No Depth (in	ches): .5	o (in pocke	ts)		
Water Table	Present?	res x	No Depth (in	ches): 8	"			
Saturation Pr (includes cap	oillary fringe)		No Depth (in					y Present? Yes X No
Describe Rec	corded Data (stream	n gauge, m	onitoring well, aerial	photos, p	previous in	spections	), if available:	
Remarks:				0 40				
Primary v	wetland hydro	biogy in	dicators A1, A	2, A3,	, and B	11 pre	sent.	

Project/Site: THRO - North Unit	City/County:	-/McKenzie		_ Sampling Date: 7/21/20
Applicant/Owner: <u>NPS</u>		Sta	ite: ND	_ Sampling Point: DP2-North
Investigator(s): <u>Jeff Gray</u>	Section, Tov	nship, Range: <u>S35,</u>	T148N, R099	W
Landform (hillslope, terrace, etc.): hillslope				Slope (%): <u>10</u>
Subregion (LRR): LRR G Lat	t: 47.597773	Long: _ <sup>-1</sup>	03.259193	Datum: WGS 84
Soil Map Unit Name: Cabbart-Badland complex, 6 to 70 percent s	lopes		NWI classif	fication: <u>No</u>
Are climatic / hydrologic conditions on the site typical for this time	of year? Yes X	No (If	no, explain in	Remarks.)
Are Vegetation, Soil, or Hydrology signific	cantly disturbed?	Are "Normal Ci	rcumstances"	' present? Yes X No
Are Vegetation, Soil, or Hydrology natura	lly problematic?	(If needed, exp	lain any answ	vers in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	wing sampling	point location	s, transect	s, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes         No         X           Yes         No         X           Yes         No         X	Is the Sampled Area within a Wetland? Yes No $\frac{\chi}{\chi}$
Remarks:		

DP2-North located in uplands on hillslope above salt flat (Wetland 2). No wetland indicators present.

	Absolute	Dominant		Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC	( • )
2				(excluding FAC-): 0 (	(A)
3				Total Number of Dominant	
4				Species Across All Strata: 2 (I	(B)
	0	= Total Cov	/er	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC: 0 (A	(A/B)
1. <u>-</u>				Prevalence Index worksheet:	
2					
3				Total % Cover of: Multiply by:	
4				OBL species x 1 =	
5				FACW species x 2 =	
	0	= Total Cov	/er	FAC species x 3 =	
<u>Herb Stratum</u> (Plot size: <sup>5' d.</sup> )				FACU species x 4 =	
1. Asclepias speciosa	5	No	FAC	UPL species x 5 =	
2. Mellilotus officinalis	20	Yes	FACU	Column Totals: (A)	(B)
3. Ratibida columnifera	3	No	UPL/NL		
4. Apocynum androsaemifolium	2	No	UPL	Prevalence Index = B/A =	
5. Agropyron cristatum	50	Yes	UPL/NL	Hydrophytic Vegetation Indicators:	
6. Poa pratensis	10	No	FACU	1 - Rapid Test for Hydrophytic Vegetation	
7 Echinacea angustifolia	5	No	UPL/NL	2 - Dominance Test is >50%	
8				$\_$ 3 - Prevalence Index is $\leq 3.0^1$	
9				4 - Morphological Adaptations <sup>1</sup> (Provide suppo data in Remarks or on a separate sheet)	orting
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	<b>`</b>
		= Total Cov	/er		,
Woody Vine Stratum (Plot size: 15' d. )				<sup>1</sup> Indicators of hydric soil and wetland hydrology mu	ıst
1. <u>-</u>				be present, unless disturbed or problematic.	
2				Hydrophytic	
	0	= Total Cov	/er	Vegetation	
% Bare Ground in Herb Stratum 5				Present? Yes <u>No X</u>	
Remarks:				·	
No hydrophytic vegetation indicators p	resent.				

Profile Desc	ription: (Describe	e to the depth nee	ded to docur	nent the i	ndicator	or confirm	n the absence	of indicators.)	
Depth	Matrix Redox Features								
(inches)	Color (moist)	<u>%</u> Co	lor (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
0-16	2.5Y 4/3	95					silt loam	dry, hard	
	2.5Y 4/4	5							
						. <u> </u>			
						·			
	-								
<sup>1</sup> Type: C=Ce	oncentration, D=De	pletion, RM=Reduc	ced Matrix, CS	S=Covered	d or Coate	d Sand G	rains. <sup>2</sup> Loo	cation: PL=Pore Lining, M=Matrix.	
Hydric Soil	Indicators: (Appli	cable to all LRRs,	unless othe	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :	
Histosol	(A1)		Sandy (	Gleyed Ma	atrix (S4)		1 cm N	Muck (A9) (LRR I, J)	
Histic Ep	pipedon (A2)		Sandy F	Redox (S5	i)		Coast	Prairie Redox (A16) (LRR F, G, H)	
Black Hi	· · ·		Stripped	d Matrix (S	6)			Surface (S7) (LRR G)	
	en Sulfide (A4)			Mucky Mir	• • •			Plains Depressions (F16)	
	d Layers (A5) ( <b>LRR</b>		-	Gleyed Ma			•	RR H outside of MLRA 72 & 73)	
	ick (A9) (LRR F, G,		·	d Matrix (I				ced Vertic (F18)	
·	d Below Dark Surfa	ce (A11)		Dark Surfa	, ,			arent Material (TF2)	
	ark Surface (A12)				Irface (F7)			Shallow Dark Surface (TF12)	
-	lucky Mineral (S1) /lucky Peat or Peat	(82) (I <b>BB C U</b> )	Redox Depressions (F8)			16)	Other (Explain in Remarks)		
	icky Peat or Peat (S		High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)				<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present,		
		55) ( <b>ERR</b> 1)	(MLRA 72 & 73 OF LRR H)			•••)		disturbed or problematic.	
Restrictive	Layer (if present):								
Type: -									
Depth (in	choc): -						Hydric Soil	Present? Yes <u>No X</u>	
	ciles).						Tryune Son		
Remarks:									
No bydr	ia cail india	otoro obco	nuad						
INO HYUI	ric soil indic		iveu.						
HYDROLO	GY								
	drology Indicators	•							
				,					

Primary Indicators (minimum	of one requ	uired; check	all that apply)		Secondary Indicators (minimum of two required)
Surface Water (A1)			_ Salt Crust (B11)		Surface Soil Cracks (B6)
High Water Table (A2)			Aquatic Invertebrates (B13)		Sparsely Vegetated Concave Surface (B8)
Saturation (A3)			Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)
Water Marks (B1)			Dry-Season Water Table (C2)		Oxidized Rhizospheres on Living Roots (C3)
Sediment Deposits (B2)			Oxidized Rhizospheres on Livin	g Roots (C3)	(where tilled)
Drift Deposits (B3)			(where not tilled)		Crayfish Burrows (C8)
Algal Mat or Crust (B4)			Presence of Reduced Iron (C4)		Saturation Visible on Aerial Imagery (C9)
Iron Deposits (B5)			Thin Muck Surface (C7)		Geomorphic Position (D2)
Inundation Visible on Ae	rial Imager	y (B7)	Other (Explain in Remarks)		FAC-Neutral Test (D5)
Water-Stained Leaves (B	39)				Frost-Heave Hummocks (D7) (LRR F)
Field Observations:					
Surface Water Present?	Yes	No	_ Depth (inches):	-	
Water Table Present?	Yes	No <u></u>	_ Depth (inches):	_	
Saturation Present? (includes capillary fringe)	Yes	No <u>×</u>	_ Depth (inches):	Wetland	Hydrology Present? Yes No X
Describe Recorded Data (str	eam gauge	, monitoring	well, aerial photos, previous inspe	ections), if av	ailable:
Remarks:					
No wetland hydrolog	gy indic	ators ob	served.		

Project/Site: THRO - North Unit	City/County: -/	McKenzie	Sampling Date: 7/21/20
Applicant/Owner: <u>NPS</u>		State: ND	Sampling Point: DP3-North
Investigator(s):	Section, Towns	ship, Range: <u>S35, T148N, R099</u> W	
Landform (hillslope, terrace, etc.): hillslope		oncave, convex, none): <u>concave</u>	
	_at: <u>47.598156</u>	Long: <u>-103.261363</u>	Datum: WGS 84
Soil Map Unit Name: Cabbart-Kremlin-Boxwell loams, 9-40 perc	ent slopes, slumped	NWI classific	cation: <u>no</u>
Are climatic / hydrologic conditions on the site typical for this tir	ne of year? Yes X	No (If no, explain in R	emarks.)
Are Vegetation, Soil, or Hydrology sign	ificantly disturbed?	Are "Normal Circumstances" p	present? Yes X No
Are Vegetation, Soil, or Hydrology natu	rally problematic?	(If needed, explain any answe	rs in Remarks.)
			·····

#### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes X Yes X Yes X	No No No	Is the Sampled Area within a Wetland?	Yes X	No
Remarks:					

DP3-North located in hillside depression with groundwater seep (Wetland 3). All three wetland indicators present.

	Absolute	Dominant		Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC (excluding FAC-):       1	(A)
2				(excluding FAC-): <u>1</u>	(A)
3				Total Number of Dominant	
4				Species Across All Strata: <u>1</u>	(B)
	0	= Total Cov	/er	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC: 100	(A/B)
1. <u>-</u>				Prevalence Index worksheet:	
2					
3				Total % Cover of: Multiply by:	
4				OBL species x 1 =	
5.				FACW species x 2 =	
	0	= Total Cov	/er	FAC species x 3 =	-
Herb Stratum (Plot size: 5' d)				FACU species x 4 =	-
1. Elocharis palustris	90	Yes	OBL	UPL species x 5 =	_
2. Cirsium arvense	4	No	FACU	Column Totals: (A)	(B)
3. Elymus smithii	4	No	FACU		
4				Prevalence Index = B/A =	-
5				Hydrophytic Vegetation Indicators:	
				1 - Rapid Test for Hydrophytic Vegetation	
6				$\underline{X}$ 2 - Dominance Test is >50%	
7				3 - Prevalence Index is $≤3.0^1$	
8				4 - Morphological Adaptations <sup>1</sup> (Provide support	orting
9				data in Remarks or on a separate sheet)	
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain	ı)
15'd	98	= Total Cov	/er		
<u>Woody Vine Stratum</u> (Plot size: <u>15' d.</u> )				<sup>1</sup> Indicators of hydric soil and wetland hydrology mube present, unless disturbed or problematic.	usi
1					
2				Hydrophytic Vegetation	
% Bare Ground in Herb Stratum 2 (mud)	0	= Total Cov	/er	Present? Yes $\frac{X}{X}$ No	
Remarks:					
			<b>F</b> ()		
Hydrophytic vegetation indicator prese	nt (Dom	inance	i est).		

SOIL	
------	--

Profile Desc	ription: (Describe	to the de	pth needed	to docun	nent the	indicator	or confir	m the abs	sence	of indicators.)	
Depth	Matrix				x Feature	4					
(inches)	Color (moist)	<u>%</u>			<u>%</u>	<u>Type'</u>	Loc <sup>2</sup>	Textu	ure	Remarks	
0-12	10YR 3/2	85	10YR 4/2		10	d	m	clay		dense clay	
			10YR 5/6	6	5	С	m				
		_				_					
					·						
					·						
<u> </u>											
	oncentration, D=De						ed Sand G			ation: PL=Pore Lining, M=Matri	
Hydric Soil I	ndicators: (Applie	cable to a	I LRRs, unle	ess other	wise no	ted.)		Indic	ators	for Problematic Hydric Soils <sup>3</sup> :	
Histosol	. ,			-	-	atrix (S4)				luck (A9) ( <b>LRR I, J</b> )	
-	pipedon (A2)			Sandy F						Prairie Redox (A16) (LRR F, G, I	H)
Black His	stic (A3) n Sulfide (A4)				Matrix (	56) ineral (F1)				urface (S7) ( <b>LRR G</b> ) lains Depressions (F16)	
	Layers (A5) (LRR	F)		•	-	latrix (F2)		'	-	R H outside of MLRA 72 & 73)	
	ck (A9) ( <b>LRR F, G</b> ,	,			d Matrix			F	•	ed Vertic (F18)	
	Below Dark Surfac	,	х	Redox E		. ,				arent Material (TF2)	
Thick Da	ark Surface (A12)					urface (F7	)		-	hallow Dark Surface (TF12)	
	lucky Mineral (S1)				Depressio	· · /				(Explain in Remarks)	
	lucky Peat or Peat	. , .		-		ressions (F				of hydrophytic vegetation and	
5 cm Mu	cky Peat or Peat (S	53) ( <b>LRR F</b>	)		RA /2 &	73 of LRF	(н)			d hydrology must be present, disturbed or problematic.	
Restrictive L	ayer (if present):								uniess		
Type:											
Depth (inc								Hvdri	c Soil	Present? Yes X No	
Remarks:								<b>,</b> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Hydric soi	il indicator F6	(Redox	Dark Su	rface)	preser	nt. Dens	e clay	in isola	ted o	depression with ground	water.
HYDROLO	GY										
Wetland Hyd	drology Indicators	:									
Primary Indic	ators (minimum of	one require	ed; check all	that apply	y)			<u>Se</u>	econda	ary Indicators (minimum of two re	quired)
X Surface	Water (A1)		S	alt Crust	(B11)				Surf	ace Soil Cracks (B6)	
X High Wa	ter Table (A2)		A	quatic Inv	vertebrate	es (B13)			_ Spa	rsely Vegetated Concave Surfac	e (B8)
Saturatio	on (A3)		H	lydrogen	Sulfide C	dor (C1)			Drai	nage Patterns (B10)	
	arks (B1)			-		Table (C2)			_	lized Rhizospheres on Living Ro	ots (C3)
	t Deposits (B2)		C		•	eres on Liv	ving Roots	s (C3)		here tilled)	
-	oosits (B3)			(where r						/fish Burrows (C8)	
	t or Crust (B4)					ed Iron (C	4)	—		ration Visible on Aerial Imagery	(C9)
	osits (B5)	1 m m m m m / / /		hin Muck						morphic Position (D2)	
	on Visible on Aerial tained Leaves (B9)	imagery (i	5/) <u> </u>	ther (Exp		emarks)				c-Neutral Test (D5) st-Heave Hummocks (D7)( <b>LRR</b> )	E)
Field Observ									_ 1103		• )
Surface Wate		Ves X	No I	Denth (inc	hes). 0						
Water Table			No				-				
Saturation Pr			No					tland Hvd	Irology	y Present? Yes X No	
(includes cap	oillary fringe)							-		, 1050m. 105 <u> </u>	
Describe Rec	corded Data (stream	n gaug <mark>e, n</mark>	nonitoring we	ll, aerial p	photos, p	revious ins	spections)	), if availat	ole:		
Remarks:											
Primary (	A1 and A3) v	vetland	hydrolo	gy indi	icators	s prese	nt.				

Project/Site:	_ City/County:/McKe	enzie	Sampling Date: 7/21/20
Applicant/Owner: NPS		State: ND	_ Sampling Point: DP4-North
Investigator(s): Jeff Gray	_ Section, Township	, Range: <u>S35, T148N, R099V</u>	N
Landform (hillslope, terrace, etc.): hillsope	Local relief (conca	ive, convex, none): <u>none</u>	Slope (%): 2-4
Subregion (LRR): Lat:	7.598147	Long: -103.261306	Datum: WGS 84
Soil Map Unit Name: Cabbart-Kremlin-Boxwell loams, 9-40 percent slopes, slump	bed	NWI classifi	cation: no
Are climatic / hydrologic conditions on the site typical for this time of	year?Yes <u>×</u> N	√o (If no, explain in F	Remarks.)
Are Vegetation, Soil, or Hydrology significant	ly disturbed?	Are "Normal Circumstances"	present? Yes X No
Are Vegetation, Soil, or Hydrology naturally p	problematic? (	If needed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	ig sampling poi	nt locations, transects	s, important features, etc.
Hydrophytic Vegetation Present? Ves No X			

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	No <u>×</u> No <u>×</u> No <u>×</u>	Is the Sampled Area within a Wetland?	Yes	No <u>×</u>			
Remarks:								
DD4 North approximately 2	2 foot oh	ove and 10 fe	ot couth of aroundwa	tor coop o	nd curface			

DP4-North approximately 2-3 feet above and 10 feet south of groundwater seep and surface depression (Wetland 3). No wetland indicators present.

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC	( • )
2				(excluding FAC-):	(A)
3				Total Number of Dominant	
4				Species Across All Strata:	(B)
	0	= Total Cov	rer	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )					(A/B)
1. Artemesia longifolia	10	Yes	NL (UPL)		
2				Prevalence Index worksheet:	
3				Total % Cover of: Multiply by:	
4				OBL species x 1 =	
5.				FACW species x 2 =	-
·		= Total Cov	er	FAC species x 3 =	-
<u>Herb Stratum</u> (Plot size: <sup>5' d.</sup> )		10101 001		FACU species x 4 =	_
1. Elymus smithii	35	Yes	FACU	UPL species x 5 =	_
2. Agropyron cristatum	20	Yes	NL (UPL)	Column Totals: (A)	
3. Poa pratensis	15	Yes	FACU		
4 Achillea millefolium	4	No	FACU	Prevalence Index = B/A =	-
5. Opuntia polyacantha	4	No	NL (UPL)	Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
				2 - Dominance Test is >50%	
7				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
8				4 - Morphological Adaptations <sup>1</sup> (Provide supp	orting
9				data in Remarks or on a separate sheet)	
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain	ı)
Woody Vine Stratum (Plot size: <sup>15' d.</sup> )	78	= Total Cov	rer	<sup>1</sup> Indicators of hydric soil and wetland hydrology me	uct
				be present, unless disturbed or problematic.	usi
1					
2		. <u> </u>		Hydrophytic Vegetation	
% Bare Ground in Herb Stratum 22 (dirt)	0	= Total Cov	rer	VegetationPresent?YesNo $\frac{\times}{}$	
Remarks:					
	agent				
No hydrophytic vegetation indicator pre	eseni.				

Depth (inches)				x Features		the absence	
111011031	Matrix Color (moist)	<u>%</u> C	color (moist)	% Type	<sup>1</sup> Loc <sup>2</sup>	Texture	Remarks
0-14	10YR 3/3	65 -				clay loam	dry; compact/dense at 14"
	10YR 3/2	35		· ·			
	10111 0/2			·			-
				· ·			
				· ·			
<sup>1</sup> Type: C=Cc	oncentration, D=De	pletion, RM=Red	uced Matrix, CS	=Covered or Coa	ated Sand Gr	ains. <sup>2</sup> Lo	cation: PL=Pore Lining, M=Matrix.
	ndicators: (Appli						for Problematic Hydric Soils <sup>3</sup> :
Histosol				Bleyed Matrix (S4	)	1 cm I	Muck (A9) ( <b>LRR I, J</b> )
	pipedon (A2)			Redox (S5)	,		Prairie Redox (A16) (LRR F, G, H)
Black His			-	Matrix (S6)			Surface (S7) (LRR G)
Hydroge	n Sulfide (A4)		Loamy M	Mucky Mineral (F	1)	High F	Plains Depressions (F16)
Stratified	I Layers (A5) ( <b>LRR</b>	: <b>F</b> )	Loamy (	Gleyed Matrix (F2	.)	(LF	RR H outside of MLRA 72 & 73)
	ck (A9) ( <b>LRR F, G</b>	. ,		d Matrix (F3)			ed Vertic (F18)
·	Below Dark Surfa	ice (A11)		Dark Surface (F6)			arent Material (TF2)
	rk Surface (A12)			d Dark Surface (F	7)		Shallow Dark Surface (TF12)
	lucky Mineral (S1)			Depressions (F8)	(540)		(Explain in Remarks)
	lucky Peat or Peat cky Peat or Peat (\$			ains Depressions RA 72 & 73 of LF			of hydrophytic vegetation and d hydrology must be present,
	CKy Feat OF Feat (	55) ( <b>LKK F</b> )		KA / 2 & / 3 01 Lr	(КП)		s disturbed or problematic.
Restrictive I	_ayer (if present):					unicas	disturbed of problematic.
Type:							
· · ·	ches):					Hydric Soil	Present? Yes No $\frac{X}{2}$
						Hyune Son	
Remarks:							
No hydro	o soil indicat	tors observ	ba				
No Hydro			<u>.</u>				
HYDROLO	GY						
I DRULU							
	drology Indicators	:					
Wetland Hyd	drology Indicators ators (minimum of		eck all that apply	<b>y</b> )		Seconda	ary Indicators (minimum of two required)
Wetland Hyd	ators (minimum of						· · · · ·
Wetland Hyd Primary Indic Surface V	ators (minimum of Water (A1)		Salt Crust	(B11)		Sur	face Soil Cracks (B6)
Wetland Hyd Primary Indic Surface V High Wa	ators (minimum of Water (A1) ter Table (A2)		Salt Crust Aquatic Inv	(B11) /ertebrates (B13)		Sur Spa	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8)
Wetland Hyd Primary Indic Surface V High War Saturatio	eators (minimum of Water (A1) ter Table (A2) on (A3)		Salt Crust Aquatic Inv Hydrogen	(B11) /ertebrates (B13) Sulfide Odor (C1)	)	Sur Spa Dra	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10)
Wetland Hyc Primary Indic Surface V High Wa Saturatio Water Ma	eators (minimum of Water (A1) ter Table (A2) on (A3) arks (B1)		Salt Crust Aquatic Inv Hydrogen Dry-Seaso	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C	) :2)	Sur Spa Dra Oxio	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3
Wetland Hyd Primary Indic Surface V High Wat Saturatio Water Ma Sedimen	tators (minimum of Water (A1) ter Table (A2) on (A3) arks (B1) ti Deposits (B2)		Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized F	(B11) /ertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L	) :2)	Sur Spa Dra Oxio (C3) (V	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 <b>vhere tilled</b> )
Wetland Hyc Primary Indic Surface V High Wa Saturatio Water Ma Sedimen Drift Dep	wators (minimum of Water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3)		Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R (where r	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C chizospheres on L not tilled)	) :2) Living Roots (	Sur Spa Dra Oxio (W (C3) (W	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 <b>vhere tilled</b> ) yfish Burrows (C8)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma	ter Table (A2) water (A1) ter Table (A2) on (A3) arks (B1) tt Deposits (B2) posits (B3) tt or Crust (B4)		Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R (where r Presence o	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L <b>hot tilled</b> ) of Reduced Iron (	) :2) Living Roots (	Sur Spa Dra Oxio (W Cra Sato	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 <b>vhere tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep	water (A1) ter Table (A2) on (A3) arks (B1) th Deposits (B2) posits (B3) th or Crust (B4) osits (B5)	one required; che	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7)	) :2) Living Roots (	C3) Cra C3 Cra C3 Cra C5 Cra C6 Cra C7 Cra C7 Cra C7 Cra	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2)
Wetland Hyc Primary Indic Surface V High Wa Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatio	water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) at or Crust (B4) osits (B5) on Visible on Aerial	one required; che	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L <b>hot tilled</b> ) of Reduced Iron (	) :2) Living Roots (	C3) Cra C3 Cra C3 Cra C4 C3 Cra C5 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pomorphic Position (D2) C-Neutral Test (D5)
Wetland Hyc Primary Indic Surface V High Wat Saturatio Water Mater Sedimen Drift Dep Algal Ma Iron Dep Inundatio Water-St	water (A1) Water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) t or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9)	one required; che	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7)	) :2) Living Roots (	C3) Cra C3 Cra C3 Cra C4 C3 Cra C5 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ	water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) at or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations:	I Imagery (B7)	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck Other (Exp	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C chizospheres on L <b>not tilled</b> ) of Reduced Iron ( Surface (C7) blain in Remarks)	) :2) Living Roots ( C4)	C3) Cra C3 Cra C3 Cra C4 C3 Cra C5 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pomorphic Position (D2) C-Neutral Test (D5)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Water	water (A1) ter Table (A2) on (A3) arks (B1) th Deposits (B2) posits (B3) th or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present?	I Imagery (B7)	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck Other (Exp	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) plain in Remarks)	) .iving Roots ( C4)	C3) Cra C3 Cra C3 Cra C4 C3 Cra C5 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4 C4	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pomorphic Position (D2) C-Neutral Test (D5)
Wetland Hyc Primary Indic Surface V High Wai Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Wate	water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) at or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present? Present?	I Imagery (B7) Yes No <u>X</u> Yes No <u>X</u>	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized F (where r Presence of Presence of Thin Muck Other (Exp	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) olain in Remarks) ches): ches):	) :2) .iving Roots ( C4)	C3) (v C3) (v C3) (v C7a C7a C7a C7a C7a C7a C7a C7a F7C	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Wetland Hyc Primary Indic Surface V High Wa Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Wate Vater Table I Saturation Pr	water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) at or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present? Present?	I Imagery (B7)	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized F (where r Presence of Presence of Thin Muck Other (Exp	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) olain in Remarks) ches): ches):	) :2) .iving Roots ( C4)	C3) (v C3) (v C3) (v C7a C7a C7a C7a C7a C7a C7a C7a F7C	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pomorphic Position (D2) C-Neutral Test (D5)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Water Surface Table I Saturation Pr (includes cap	water (A1) ter Table (A2) on (A3) arks (B1) at Deposits (B2) posits (B3) at or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present? Present?	I Imagery (B7) Yes No _X Yes No _X Yes No _X	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Presence o Presence o Thin Muck Other (Exp  Depth (ino Depth (ino	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) olain in Remarks) ches): ches): ches):	) .2) .iving Roots ( C4)  Wetla	C3) (v C3) (v C3) (v C7a C7a C7a C7a C7a C7a C7a C7a C7a C7a	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Water Surface Table I Saturation Pr (includes cap	ators (minimum of Water (A1) ter Table (A2) on (A3) arks (B1) tt Deposits (B2) oosits (B3) tt or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	I Imagery (B7) Yes No _X Yes No _X Yes No _X	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Presence o Presence o Thin Muck Other (Exp  Depth (ino Depth (ino	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) olain in Remarks) ches): ches): ches):	) .2) .iving Roots ( C4)  Wetla	C3) (v C3) (v C3) (v C7a C7a C7a C7a C7a C7a C7a C7a C7a C7a	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Wetland Hyc Primary Indic Surface V High Wa' Saturatio Water Ma Sedimen Drift Dep Algal Ma Iron Dep Inundatic Water-St Field Observ Surface Water Surface Water Saturation Pr (includes cap	ators (minimum of Water (A1) ter Table (A2) on (A3) arks (B1) tt Deposits (B2) oosits (B3) tt or Crust (B4) osits (B5) on Visible on Aerial tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	I Imagery (B7) Yes No _X Yes No _X Yes No _X	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R Presence o Presence o Thin Muck Other (Exp  Depth (inc Depth (inc	(B11) vertebrates (B13) Sulfide Odor (C1) n Water Table (C Rhizospheres on L not tilled) of Reduced Iron ( Surface (C7) olain in Remarks) ches): ches): ches):	) .2) .iving Roots ( C4)  Wetla	C3) (v C3) (v C3) (v C7a C7a C7a C7a C7a C7a C7a C7a C7a C7a	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)

Project/Site: THRO - North Unit	City/County: -/McKenzie		Sampling Date: 7/	21/20
Applicant/Owner: NPS		State: ND	Sampling Point:	P5-North
Investigator(s): Jeff Gray	Section, Township, Range:	S35, T148N, R099W		
Landform (hillslope, terrace, etc.): Drainage	Local relief (concave, conve	ex, none): <u>none (linear</u>	depression) Slop	e (%):
Subregion (LRR): LRR G Lat: 47.	599007 Lor	ng: <u>-103.262756</u>	Datum	n: WGS 84
Soil Map Unit Name: Patent loam, 0 to 6 percent slopes, occasionally fl	ooded	NWI classifica	ation: PEM	
Are climatic / hydrologic conditions on the site typical for this time of ye	ar? Yes X No	_ (If no, explain in Re	emarks.)	
Are Vegetation, Soil, or Hydrology significantly	disturbed? Are "Norn	nal Circumstances" p	resent? Yes X	No
Are Vegetation, Soil, or Hydrology naturally pro	oblematic? (If needed	l, explain any answer	rs in Remarks.)	
SUMMARY OF FINDINGS – Attach site map showing	sampling point locat	tions, transects,	, important fea	itures, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes <u>×</u> Yes <u>×</u> Yes <u>×</u>	No No No	Is the Sampled Area within a Wetland?	Yes X	No				
Remarks:									
DDC North Is sated in dust		DDE North Issued in during an (Matland 4D) wast of Maintenance Many All three watland indicators							

DP5-North located in drainage (Wetland 1B) west of Maintenance Way. All three wetland indicators present.

	Absolute	Dominant		Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC	( • )
2				(excluding FAC-): <u>1</u> (	(A)
3				Total Number of Dominant	
4				Species Across All Strata: (	(B)
	0	= Total Cov	/er	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC: $100$ (a)	(A/B)
1. <u>-</u>					
2				Prevalence Index worksheet:	
3				Total % Cover of: Multiply by:	
4				OBL species x 1 =	
5				FACW species x 2 =	
	-	= Total Cov	/er	FAC species x 3 =	
Herb Stratum (Plot size: <sup>5' d.</sup> )				FACU species x 4 =	
1. Shoenoplectus pungens	Yes	50	OBL	UPL species x 5 =	
2. Carex athrostachya	No	10	FACW	Column Totals: (A)	(B)
3. Triglochin maritima	No	4	OBL		
4. Distichlis spicata	No	8	FACW	Prevalence Index = B/A =	
5. Bromus inermis	No	5	UPL	Hydrophytic Vegetation Indicators:	
6. Stipa comata	No	2	UPL	1 - Rapid Test for Hydrophytic Vegetation	
				$\underline{X}$ 2 - Dominance Test is >50%	
7				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
8				4 - Morphological Adaptations <sup>1</sup> (Provide suppo	orting
9				data in Remarks or on a separate sheet)	
10	70			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	)
Woody Vine Stratum (Plot size: <sup>15' d.</sup> )	19	= Total Cov	/er	<sup>1</sup> Indicators of hydric soil and wetland hydrology mu	ist
				be present, unless disturbed or problematic.	
1					
2	0	Tatal Oa		Hydrophytic Vegetation	
% Bare Ground in Herb Stratum <sup>21 (mud)</sup>		= Total Cov	/er	Present? Yes X No	
Remarks:					
Hydrophytic vegetation indicator prese	nt (Dom	inance <sup>-</sup>	Test).		

SOIL	S	0		
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	cription: (Describe	to the dept				r or confirr	n the absence	of indicators.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	ox Featur %	es Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-16	10YR 4/2	60	10YR 4/1	10	d	 m	silty clay	redox features up to surface
	10YR 3/2	25	10YR 4/6	5	с	m		·
	·							
	<u> </u>							
<sup>1</sup> Type: C=C	oncentration, D=De	pletion. RM=	Reduced Matrix. C	S=Cover	ed or Coat	ed Sand G	rains. <sup>2</sup> Lo	cation: PL=Pore Lining, M=Matrix.
	Indicators: (Applie							for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Sandy	Gleyed M	latrix (S4)		1 cm I	Muck (A9) ( <b>LRR I, J</b> )
Histic E	pipedon (A2)			Redox (S			Coast	Prairie Redox (A16) (LRR F, G, H)
	istic (A3)			ed Matrix				Surface (S7) (LRR G)
	en Sulfide (A4)	-		-	lineral (F1		-	Plains Depressions (F16)
	d Layers (A5) ( <b>LRR</b> Jck (A9) ( <b>LRR F, G,</b>		Loamy Deplet	Gleyed N	Aatrix (F2)		•	RR H outside of MLRA 72 & 73) ced Vertic (F18)
	d Below Dark Surfac	,	Redox	Dark Sur	(F6)			arent Material (TF2)
	ark Surface (A12)				Surface (F	7)		Shallow Dark Surface (TF12)
Sandy M	/lucky Mineral (S1)		Redox	Depressi	ons (F8)			(Explain in Remarks)
	Mucky Peat or Peat				ressions (			of hydrophytic vegetation and
5 cm Mu	ucky Peat or Peat (S	53) ( <b>LRR F</b> )	(M	LRA 72 8	73 of LR	R H)		d hydrology must be present,
Restrictive	Layer (if present):						unies	s disturbed or problematic.
Type:								
· · · ·	ches):						Hydric Soi	Present? Yes X No
Remarks:	<u> </u>							
Remarko.								
Hydric s	oil indicator	F3 (Dep	oleted Matrix	x) obs	erved.			
HYDROLO	GY							
	drology Indicators							
-	cators (minimum of		l: check all that an	(vlc			Second	ary Indicators (minimum of two required)
-	Water (A1)	<u>one requiree</u>	<u>X</u> Salt Crus					face Soil Cracks (B6)
	ater Table (A2)		Aquatic I		tes (B13)			arsely Vegetated Concave Surface (B8)
X Saturati				n Sulfide (	• •			inage Patterns (B10)
	larks (B1)				Table (C2	2)		dized Rhizospheres on Living Roots (C3)
	nt Deposits (B2)					ving Roots		vhere tilled)
	posits (B3)			not tilled		-		yfish Burrows (C8)
Algal Ma	at or Crust (B4)		Presence	of Reduc	ced Iron (C	24)	Sat	uration Visible on Aerial Imagery (C9)
Iron Dep	posits (B5)		Thin Muc	k Surface	(C7)		Geo	omorphic Position (D2)
Inundati	on Visible on Aerial	Imagery (B7	) Other (E	kplain in F	Remarks)			C-Neutral Test (D5)
	stained Leaves (B9)						Fro	st-Heave Hummocks (D7) (LRR F)
Field Obser		v		0	F			
Surface Wat			No Depth (i					
Water Table			No Depth (i					
Saturation P		Ƴes <u>×</u> Ⅰ	No Depth (i	nches): 0		Wet	and Hydrolog	y Present? Yes <sup>×</sup> No
(includes ca Describe Re	corded Data (strean	n gauge, mc	nitoring well, aeria	l photos, r	previous in	spections).	if available:	
	<b>,</b>	5 5 / 1		. /1		. ,,		
Remarks:								
Flowing	water in drain	age cha	nnel. Wetlar	nd hydr	ology i	ndicato	rs A1, A2.	A3, B2, B11, and B10

Project/Site:	City/County: -/McKenzie		Sampling Date: 7/21/20
Applicant/Owner: NPS		State: ND	Sampling Point: DP6-North
Investigator(s):	Section, Township, Range:	S35, T148N, R099W	
Landform (hillslope, terrace, etc.): road embankment	Local relief (concave, conv	ex, none): <u>none</u>	Slope (%): 8-10
Subregion (LRR): LRR G Lat: 47.	598949 Lo	ng: <u>-103.262691</u>	Datum: WGS 84
Soil Map Unit Name: Patent loam, 0 to 6 percent slopes, occasionally flooded		NWI classifica	ation: no
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes X No	_ (If no, explain in Re	emarks.)
Are Vegetation, Soil, or Hydrology significantly	disturbed? Are "Norr	nal Circumstances" p	resent? Yes X No
Are Vegetation, Soil, or Hydrology naturally pro	oblematic? (If needed	l, explain any answer	s in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	sampling point loca	tions, transects,	important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	No <u>X</u> No <u>X</u> No <u>X</u>	Is the Sampled Area within a Wetland?	Yes	No <u>×</u>
Remarks:					

DP6-North located in uplands on road embankment above drainage (Wetland 1B). No wetland indicators present.

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' d. )	% Cover	Species?	Status	Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC	
2				(excluding FAC-): 0 (/	A)
3.				Total Number of Dominant	
4				Species Across All Strata: 1 (E	3)
- T		= Total Cov			
Sapling/Shrub Stratum (Plot size: 15' d. )		- 10tal C01		Percent of Dominant Species That Are OBL, FACW, or FAC: <sup>0</sup> (A	۵/B)
1. <u>-</u> ,					ч <b>с</b> )
2.				Prevalence Index worksheet:	
				Total % Cover of: Multiply by:	
3				OBL species x 1 =	
4				FACW species x 2 =	
5				FAC species x 3 =	
Herb Stratum (Plot size: <sup>5' d</sup> )	0	= Total Cov	/er	FACU species x 4 =	
1. Bromus inermis	65	Yes	UPL	· · · · · · · · · · · · · · · · · · ·	
2. Agropyron cristatum	12	 No	UPL/NL	UPL species x 5 =	
				Column Totals: (A)	(B)
3. Stipa comata	4	No	UPL	Prevalence Index = B/A =	
4. Elymus smithii	15	No	FACU	Hydrophytic Vegetation Indicators:	
5. Melilotus officinalis	4	No	FACU		
6				1 - Rapid Test for Hydrophytic Vegetation	
7				2 - Dominance Test is >50%	
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
9				4 - Morphological Adaptations <sup>1</sup> (Provide suppor data in Remarks or on a separate sheet)	rting
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
	100	= Total Cov	/er		
Woody Vine Stratum (Plot size: 15' d. )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	st
1. <u>-</u>					
2				Hydrophytic	
	0	= Total Cov	/er	Vegetation	
% Bare Ground in Herb Stratum _0				Present? Yes <u>No ×</u>	
Remarks:					
No hydrophytic vegetation indicators p	resent.				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	<u>Matrix</u> Color (moist)	%	Rede Color (moist)	<u>ox Feature</u> %	s Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
<u>(incries)</u> 0-14	10YR 3/3	25 -		- /0	- <u>י י י ארב</u>	-	loam	dry, compact
	10YR 4/3							a.), compact
	10TK 4/3	75						
					·			
					<u></u>			
	oncentration, D=De					ed Sand G		cation: PL=Pore Lining, M=Matrix.
-	Indicators: (Applie	cable to all LRF						s for Problematic Hydric Soils <sup>3</sup> :
Histosol	( )		Sandy	-				Muck (A9) ( <b>LRR I, J</b> )
-	pipedon (A2)			Redox (S5				Prairie Redox (A16) (LRR F, G, H)
	istic (A3)			d Matrix (S				Surface (S7) (LRR G)
	en Sulfide (A4) d Layers (A5) ( <b>LRR</b>	E)		Mucky Mil Gleyed M			-	Plains Depressions (F16) RR H outside of MLRA 72 & 73)
	uck (A9) (LRR F, G,		-	ed Matrix (				ced Vertic (F18)
	d Below Dark Surfac	,		Dark Surfa	,			Parent Material (TF2)
-	ark Surface (A12)	()		ed Dark Su	• •	)		Shallow Dark Surface (TF12)
	/lucky Mineral (S1)			Depressio				(Explain in Remarks)
2.5 cm M	Mucky Peat or Peat	(S2) ( <b>LRR G, H</b>	) High P	lains Depre	essions (F	16)	<sup>3</sup> Indicators	of hydrophytic vegetation and
5 cm Mu	ucky Peat or Peat (S	3) ( <b>LRR F</b> )	(MI	_RA 72 &	73 of LRF	R H)	wetlan	d hydrology must be present,
							unless	s disturbed or problematic.
Restrictive	Layer (if present):							
Туре:			-					~
Depth (in	ches):		-				Hydric Soil	l Present? Yes No _ <sup>X</sup>
Remarks:								
N a la valut	!! !!! .!!							
NO NYUN	c soil indicato	is present	•					
HYDROLO	GY							
Wetland Hy	drology Indicators	:						
Primary India	cators (minimum of	one required; ch	eck all that app	ly)			Second	ary Indicators (minimum of two require
Surface	Water (A1)		Salt Crus	t (B11)			Sur	face Soil Cracks (B6)
	ater Table (A2)		Aquatic Ir		es (B13)			arsely Vegetated Concave Surface (B8
Saturatio			Hydrogen					inage Patterns (B10)
	larks (B1)		Dry-Seas			)		dized Rhizospheres on Living Roots (C
Sedimer	nt Deposits (B2)		Oxidized					vhere tilled)
Drift Dep	posits (B3)			not tilled)		-		yfish Burrows (C8)
Algal Ma	at or Crust (B4)		Presence	of Reduce	ed Iron (C4	4)	Sat	uration Visible on Aerial Imagery (C9)
Iron Dep			Thin Muc	k Surface	(C7)			omorphic Position (D2)
Inundati	on Visible on Aerial	Imagery (B7)	Other (Ex	plain in Re	emarks)		FA0	C-Neutral Test (D5)
Water-S	stained Leaves (B9)						Fro	st-Heave Hummocks (D7) (LRR F)
Field Obser	vations:							
Surface Wat	er Present?	Yes No _	X Depth (ir	nches):				
Water Table		res No						
Saturation P		/es No					land Hydrolog	ly Present? Yes No $\frac{\times}{}$
(includes cap	pillary fringe)							
Describe Re	corded Data (stream	n gauge, monito	ring well, aerial	photos, pr	revious ins	spections)	, if available:	
Remarks:								
No wetla	nd hydrology	indicators	present.					

Project/Site:	City/County: //McKenzie		Sampling Date:	7/22/20
Applicant/Owner: NPS		State: ND	Sampling Point:	DP7-North
Investigator(s):	Section, Township, Rang	ge: <u>S35, T148N, R099W</u>	1	
Landform (hillslope, terrace, etc.): Hillslope/floodplain	_ Local relief (concave, co			ope (%): <u>1-2</u>
	7.600029	Long: <u>-103.268818</u>	Datu	um: WGS 84
Soil Map Unit Name: Cabbart-Kremlin-Bowell loams, 9 to 50 percent sl	opes, slumped	NWI classific	ation: <u>no</u>	
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No	(If no, explain in R	emarks.)	
Are Vegetation, Soil, or Hydrology significantly	y disturbed? Are "N	ormal Circumstances" p	resent? Yes X	No
Are Vegetation, Soil, or Hydrology naturally pr	roblematic? (If nee	ded, explain any answei	rs in Remarks.)	
CLIMMARY OF FINDINCS Attach site man showin		antiona transacta	inco outout fe	

#### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes X	No No No	Is the Sampled Area within a Wetland?	Yes <u>×</u>	No
Remarks:					

DP7-North located adjacent to ponded area near the Little Missouri River. All three wetland indicators present.

	Absolute			Dominance Test worksheet:		
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species		
1. <u>-</u>				That Are OBL, FACW, or FAC (excluding FAC-):	1	(A)
2				(excluding TAC ).		(~)
3				Total Number of Dominant	1	
4				Species Across All Strata:	1	(B)
2	0	= Total Cov	/er	Percent of Dominant Species		
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC:	100	(A/B)
1				Prevalence Index worksheet:		
2				Total % Cover of:		
3				OBL species		
4				FACW species		
5						
5'd	0	= Total Cov	/er	FAC species		
Herb Stratum (Plot size: <sup>5' d.</sup> )	Yes	25	OBL	FACU species		
1. Eleocharis palustris		35		UPL species		
2. Carex athrostachya	No	5	FACW	Column Totals:	(A)	_ (B)
3				Prevalence Index = B/A	-	
4				Hydrophytic Vegetation India		
5				1 - Rapid Test for Hydroph		
6				X 2 - Dominance Test is >50		
7						
8				3 - Prevalence Index is ≤3		
9				4 - Morphological Adaptati data in Remarks or on	ons' (Provide sup) a separate sheet)	porting
10				Problematic Hydrophytic V	egetation <sup>1</sup> (Explai/	in)
4514	40	= Total Cov	/er			
<u>Woody Vine Stratum</u> (Plot size: <u>15' d.</u> ) 1)				<sup>1</sup> Indicators of hydric soil and we be present, unless disturbed on		nust
				Hydrophytic		
2	0	= Total Cov		Vegetation		
% Bare Ground in Herb Stratum 60 (matted veg.)				Present? Yes X	No	
Remarks:				•		
Hydrophytic vegetation indicator prese	nt (Dom	inance <sup>-</sup>	Test).			

SOIL	S	0		
------	---	---	--	--

Profile Desc	ription: (Describ	e to the de	pth needed to doo	ument the	indicator	or confir	m the absence	e of indicators.)
Depth	Matrix			dox Feature			<u> </u>	
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-16	10YR 4/2	70	10YR 4/6	10	С	m	silty clay	redox features in upper 8"
	10YR 3/2	20				m		
						. <u></u>		
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RM	I=Reduced Matrix.	CS=Covere	ed or Coat	ed Sand G	Grains. <sup>2</sup> Lo	cation: PL=Pore Lining, M=Matrix.
	Indicators: (Appli							s for Problematic Hydric Soils <sup>3</sup> :
Histosol				y Gleyed M				Muck (A9) ( <b>LRR I, J</b> )
	pipedon (A2)			y Redox (S				Prairie Redox (A16) (LRR F, G, H)
Black Hi			Stripp	bed Matrix (	S6)		Dark S	Surface (S7) (LRR G)
Hydroge	n Sulfide (A4)			ny Mucky M			High F	Plains Depressions (F16)
	l Layers (A5) ( <b>LRR</b>		Loam	ny Gleyed N	latrix (F2)			RR H outside of MLRA 72 & 73)
	ick (A9) ( <b>LRR F, G</b>			eted Matrix				ced Vertic (F18)
	d Below Dark Surfa ark Surface (A12)	ice (ATT)		x Dark Surf eted Dark S	. ,	')		Parent Material (TF2) Shallow Dark Surface (TF12)
	lucky Mineral (S1)			x Depression		)		(Explain in Remarks)
	lucky Peat or Peat	(S2) ( <b>LRR</b>		Plains Depr		-16)		s of hydrophytic vegetation and
	icky Peat or Peat (			MLRA 72 &				nd hydrology must be present,
							unless	s disturbed or problematic.
Restrictive I	_ayer (if present):							
Туре:								
Depth (ind	ches):						Hydric Soi	I Present? Yes $\stackrel{\times}{$
Remarks:							•	
Hydric s	oil indicator	F3 (De	pleted Matr	IX) ODSE	erved.			
HYDROLO	GV							
	drology Indicators							
	cators (minimum of	one require						ary Indicators (minimum of two required)
X Surface			Salt Cru					face Soil Cracks (B6)
	iter Table (A2)			Invertebrat				arsely Vegetated Concave Surface (B8)
X Saturatio				en Sulfide C		<b>`</b>		ainage Patterns (B10)
	arks (B1)		-	ason Water				dized Rhizospheres on Living Roots (C3)
	nt Deposits (B2)			d Rhizosphe		ning Rools		where tilled)
	bosits (B3)		,	e not tilled		4)		ayfish Burrows (C8)
-	at or Crust (B4) posits (B5)			ce of Reduc Ick Surface		4)		uration Visible on Aerial Imagery (C9) omorphic Position (D2)
	on Visible on Aeria	l Imagery (F		Explain in R	• •			C-Neutral Test (D5)
	tained Leaves (B9)				cinarks)			st-Heave Hummocks (D7) (LRR F)
Field Obser								
Surface Wate		Yes X	No Depth	(inches). a	djacent			
Water Table			No Depth			—		
			No Depth				land Uvdralas	y Present? Yes <sup>x</sup> No
Saturation Provided (includes cap		185	Depth	(incries): <u> </u>			uanu nyurulog	Jy Fresents Tes NO
	corded Data (stream	m gauge, m	onitoring well, aeri	al photos, p	revious in	spections)	, if available:	
Remarks:								

Ponded water adjacent. Wetland hydrology indicators A1, A2, and A3 observed.

Project/Site: THRO-North Unit	City/County: -/McKenzie		Sampling Date: 7/22/20				
Applicant/Owner: NPS		State: ND	Sampling Point: DP8-North				
Investigator(s): Jeff Gray	_ Section, Township, Range: S35, T148N, R099W						
Landform (hillslope, terrace, etc.): hillslope			Slope (%): <u>5</u>				
Subregion (LRR): LRR G Lat: 47	7.600061 I	_ong: <u>-103.268777</u>	Datum: WGS 84				
Soil Map Unit Name: Cabbart-Kremlin-Bowell loams, 9 to 50 percent sl	opes, slumped	NWI classific	ation: no				
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No	(If no, explain in R	emarks.)				
Are Vegetation, Soil, or Hydrology significantly	y disturbed? Are "No	ormal Circumstances" p	present? Yes X No				
Are Vegetation, Soil, or Hydrology naturally pr	oblematic? (If need	ded, explain any answe	rs in Remarks.)				
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.							

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes N	o <u>X</u> o <u>X</u> o <u>X</u>	Is the Sampled Area within a Wetland?	Yes	No <u></u>		
Remarks:			-				
DD0 North leasted on hillside shows readed eres. No wetland indicators present							

DP8-North located on hillside above ponded area. No wetland indicators present.

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species
1. Ulmus americana	5	Yes	FAC	That Are OBL, FACW, or FAC
2. Juniperus communis	3	Yes	UPL	(excluding FAC-): $1$ (A)
3				Total Number of Dominant
4.				Species Across All Strata: 5 (B)
	8	= Total Cov	/er	Percent of Dominant Species
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC: $20$ (A/B)
1. Symphoricarpos occidentalis	8	Yes	UPL	
2. Rosa woodsii	4	Yes	FACU	Prevalence Index worksheet:
3				Total % Cover of: Multiply by:
				OBL species x 1 =
4				FACW species x 2 =
5	12	- Total Car		FAC species x 3 =
Herb Stratum (Plot size: <sup>5' d</sup> )		= Total Cov	/er	FACU species x 4 =
1. Bromus inermis	5	No	UPL	UPL species x 5 =
2. Agropyron cristatum	5	No	UPL/NL	Column Totals: (A) (B)
3. Euphorbia esula	50	Yes	NL/UPL	
4. Poa pratensis	15	No	FACU	Prevalence Index = B/A =
5. Melilotus officinalis	5	No	FACU	Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
				$\_$ 3 - Prevalence Index is $\leq 3.0^1$
8 9				4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	80	= Total Cov	/er	
Woody Vine Stratum (Plot size: 15' d. )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. <u>-</u>				be present, unless disturbed or problematic.
2				Hydrophytic
	0	= Total Cov	/er	Vegetation
% Bare Ground in Herb Stratum 20				Present? Yes No $\frac{X}{}$
Remarks:				
No hydrophytic vegetation indicators p	resent.			

Profile Desc	ription: (Describe	to the depth	needed to docu	nent the i	ndicator	or confirn	n the absence	of indicate	ors.)	
Depth	Matrix			x Feature		~				
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-14	10YR 4/3	65 -		-	-	-	loam	hard		
	10YR 3/3	35								
17 0.0							. 2.		<b>D</b> 1111 <b>N</b>	
	ncentration, D=De					ed Sand Gi			Pore Lining, M	
-	ndicators: (Appli	cable to all L							matic Hydric S	OIIS :
<u> </u>	· · ·		Sandy					Muck (A9) (		
Black His	ipedon (A2)			Redox (S5 d Matrix (S				Burface (S7	lox (A16) (LRR	г, <b>G</b> , <b>H</b> )
	n Sulfide (A4)			Mucky Mir					essions (F16)	
	Layers (A5) (LRR	F)		Gleyed Ma			-		de of MLRA 72	<b>&amp; 73</b> )
	ck (A9) ( <b>LRR F, G</b> ,			d Matrix (			•	ed Vertic (F		a i o)
	Below Dark Surfac	,		Dark Surfa	,			arent Matei	,	
Thick Da	rk Surface (A12)		Deplete	d Dark Su	Irface (F7	)	Very S	Shallow Dar	k Surface (TF12	<u>?)</u>
	ucky Mineral (S1)			Depressio				(Explain in	,	
	lucky Peat or Peat			ains Depre				• •	ytic vegetation a	
5 cm Mu	cky Peat or Peat (S	63) ( <b>LRR F</b> )	(ML	RA 72 & 1	73 of LRF	R H)			must be preser	nt,
De staistisse I	/: <b>f</b>						unless	disturbed	or problematic.	
_	ayer (if present):									
Type:										X
Depth (inc	:hes):						Hydric Soil	Present?	Yes	No <u>×</u>
Remarks:										
	!! !!!		- 1							
ino nyario	soil indicate	ors preser	nt.							
HYDROLO	GY									
	Irology Indicators									
-	ators (minimum of		abook all that and	)			Second	an Indianta	ro (minimum of	two required)
	· · · · ·	one required;							<u>rs (minimum of </u>	two required)
	Water (A1)		Salt Crust		- (D40)			face Soil Cr		
-	ter Table (A2)		Aquatic In						tated Concave S	surface (B8)
Saturatio			Hydrogen		. ,			inage Patte		
	arks (B1)		Dry-Seaso						spheres on Livi	ing Roots (C3)
	t Deposits (B2)		Oxidized F			ing Roots		vhere tilled	,	
-	osits (B3)			not tilled)		4)		yfish Burrov	. ,	
-	t or Crust (B4) osits (B5)		Presence			+)			ble on Aerial Ima osition (D2)	igery (C9)
	on Visible on Aerial	Imagory (P7)						C-Neutral Te		
	ained Leaves (B9)	iiliagery (D7)			illaiks)				ummocks (D7)	
Field Observ	. ,						1103			
			X Denth (in	) -						
Surface Wate			Depth (in							
Water Table			Depth (in							X
Saturation Pr		Yes No	o X Depth (in	ches):		Wetl	and Hydrolog	y Present?	Yes	No <u>×</u>
(includes cap Describe Rec	corded Data (stream	n gauge, mon	itoring well, aerial	photos. pr	evious ins	pections).	if available:			
	(	5 5-7 51	J , ,			//				
Remarks:										
	nd hydrology	indicator	s nresent							
	na nyurulugy	maidatul	o present.							

Project/Site: THRO South Unit	City/County: Medora	a/Billings	Sampling Date: 7/20/20
Applicant/Owner: <u>NPS</u>		State: ND	Sampling Point: DP1-South
Investigator(s): Jeff Gray	_ Section, Township,	Range: <u>S27, T140N, R102W</u>	1
Landform (hillslope, terrace, etc.): floodplain		ve, convex, none): <u>concave</u>	
Subregion (LRR): LRR G Lat: 46	3.916679	Long: <u>-103.525852</u>	Datum: WGS 84
Soil Map Unit Name: Havre silt loam, 0-2 percent slopes, occasionally	flooded	NWI classific	ation: <u>no</u>
Are climatic / hydrologic conditions on the site typical for this time of y	/ear? Yes X No	o (If no, explain in R	emarks.)
Are Vegetation, Soil, or Hydrology significantl	y disturbed? A	re "Normal Circumstances" p	oresent? Yes X No
Are Vegetation, Soil, or Hydrology naturally p	roblematic? (If	f needed, explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	g sampling poin	t locations, transects	, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes         X         No           Yes         X         No            Yes         X         No            Yes         X         No	Is the Sampled Area within a Wetland?	Yes X	No
Remarks <sup>.</sup>				

DP1-South located in Wetland 1 at stormwater outfall from visitor center parking lot in cottonwood stand in Little Missouri River floodplain. All three wetland indicators present.

#### **VEGETATION – Use scientific names of plants.**

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' d.		Species?			
1 Populus deltoides	35	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC	
2. Fraxinus pennsylvanica	20	Yes	FAC		A)
3				Total Number of Dominant	
4				Species Across All Strata: <u>6</u> (E	3)
	55	= Total Cov	ver	Demont of Deminent Creation	
Sapling/Shrub Stratum (Plot size: 15' d. )		10101 00		Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A	VB)
1. Fraxinus pennsylvanica	25	Yes	FAC		,
2. Cornus sericea	20	Yes	FACW	Prevalence Index worksheet:	
3. Rosa woodsii	5	No	FACU	Total % Cover of: Multiply by:	
4				OBL species x 1 =	
		·		FACW species x 2 =	
5		= Total Co		FAC species x 3 =	
Herb Stratum (Plot size: <sup>5' d.</sup> )			ver	FACU species x 4 =	
1. Poa palustris	20	Yes	FACW	UPL species x 5 =	
2. Carex sp.*	50	Yes	FACW	Column Totals: (A) (	(B)
3					
4				Prevalence Index = B/A =	
5				Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
				2 - Dominance Test is >50%	
7				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
8				4 - Morphological Adaptations <sup>1</sup> (Provide suppor	ting
9				data in Remarks or on a separate sheet)	
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
Woody Vine Stratum (Plot size: 15' d.	10	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology mus	st
1. <u>-</u>				be present, unless disturbed or problematic.	
2				Hydrophytic	
	0	= Total Co	ver	Vegetation	
% Bare Ground in Herb Stratum 30 (mud)		10101 00		Present? Yes X No	
Remarks:				1	

\*No seed head observed so unable to identify to species. Sedge assumed to be FACW or wetter due to saturated growing conditions and ponding nearby. Hydrophytic vegetation indicator present (Dominance Test).

	cription. (Describe		eptil heeded to doct		mulcator		n the absence	of indicators.)
Depth	Matrix			ox Feature		. 2		
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture	Remarks
0-8	10YR 3/2	80	<u> </u>				clay	dense clay, saturated @ 4"
	10Yr 4/2	20						
8-16	10YR 4/2	90	10YR 4/6	4	C	PL	clay	
			10Yr 4/1	6	d	Μ		
<sup>1</sup> Type: C=C	oncentration. D=De	pletion. RI	- M=Reduced Matrix, C	S=Covere	ed or Coate	d Sand G	rains. <sup>2</sup> Lo	cation: PL=Pore Lining, M=Matrix.
			II LRRs, unless oth					of or Problematic Hydric Soils <sup>3</sup> :
Histosol			Sandy				1 cm l	Muck (A9) ( <b>LRR I, J</b> )
Histic E	pipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)
Black H	istic (A3)		Strippe	ed Matrix (	S6)		Dark S	Surface (S7) (LRR G)
	en Sulfide (A4)			•	ineral (F1)		-	Plains Depressions (F16)
	d Layers (A5) (LRR			-	latrix (F2)		•	RR H outside of MLRA 72 & 73)
	uck (A9) ( <b>LRR F, G</b> ,			ed Matrix	. ,			ced Vertic (F18)
-	d Below Dark Surfa	ce (A11)		Dark Sur				arent Material (TF2)
	ark Surface (A12) Mucky Mineral (S1)		Deplet		urface (F7)		-	Shallow Dark Surface (TF12) (Explain in Remarks)
	Mucky Peat or Peat	(S2) (LRF			ressions (F	16)		of hydrophytic vegetation and
	ucky Peat or Peat (S				73 of LRR			d hydrology must be present,
	, ,	<i>,</i> , ,	,			,		s disturbed or problematic.
Restrictive	Layer (if present):							
Туре:								Y
Depth (in	ches):						Hydric Soi	l Present? Yes X No
Remarks:								
		A11(a	deploted bold	w dor	k ourfo	oo) oh	a a ruad	
	soil indicator	A11(c	depleted belo	w dar	k surfa	ce) ob	oserved.	
Hydric s		A11(c	depleted belo	w dar	k surfa	ce) ob	oserved.	
Hydric s HYDROLO			depleted belo	w dar	k surfa	ce) ob	oserved.	
Hydric s HYDROLO Wetland Hy	GY drology Indicators				k surfa	ce) ob		ary Indicators (minimum of two required)
Hydric s HYDROLO Wetland Hy Primary India	GY drology Indicators			bly)	k surfa	ce) ob	Second	ary Indicators (minimum of two required) face Soil Cracks (B6)
Hydric s HYDROLO Wetland Hy Primary India Surface	GY drology Indicators cators (minimum of		ed; check all that app	<u>bly)</u> t (B11)		ce) ob	<u>Second</u> Sur	· · · · · · · · · ·
Hydric s HYDROLO Wetland Hy Primary India Surface	IGY drology Indicators cators (minimum of Water (A1) ater Table (A2)		ed; check all that app Salt Crus	oly) t (B11) nvertebrat	es (B13)	ce) ob	<u>Second</u> Sur Spa	face Soil Cracks (B6)
Hydric s HYDROLO Wetland Hy Primary India 	IGY drology Indicators cators (minimum of Water (A1) ater Table (A2)		r <u>ed; check all that app</u> Salt Crus Aquatic I	oly) It (B11) nvertebrat	es (B13) )dor (C1)	ce) ob	<u>Second</u> Sur Spa Dra	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa Saturati Water M	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3)		ed; check all that app Salt Crus Aquatic I Hydroger	oly) t (B11) nvertebrat n Sulfide C son Water	es (B13) Odor (C1) Table (C2)		Second Sur Spa Dra Oxi	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturati Water M Sedimen	GY drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) farks (B1)		red; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized	oly) t (B11) nvertebrat n Sulfide C son Water	es (B13) Ddor (C1) Table (C2) eres on Liv		<u>Second</u> Sur Spa Dra Oxi (C3) (V	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimen Drift De Algal Ma	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)		red; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized	bly) t (B11) nvertebrat n Sulfide C son Water Rhizosph <b>not tilled</b>	es (B13) Odor (C1) Table (C2) eres on Liv )	ing Roots	<u>Second</u> Sur Dra Oxi (C3) (V	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>vhere tilled</b> )
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimei Drift De	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)		red; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where	bly) it (B11) in Vertebrat in Sulfide C son Water Rhizosph <b>not tilled</b> e of Reduc	es (B13) Odor (C1) Table (C2) eres on Liv ) ed Iron (C4	ing Roots	<u>Second</u> Sur Dra Oxi (C3) Cra Sat	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>vhere tilled</b> ) yfish Burrows (C8)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturati Water M Sedimen Drift Dej Algal Ma Iron Deg Inundati	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial	: one requir Imagery (	ed; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where Presence Thin Muc	bly) t (B11) nvertebrat n Sulfide C son Water Rhizosph <b>not tilled</b> e of Reduc k Surface	es (B13) Odor (C1) Table (C2) eres on Liv ) eed Iron (C4 (C7)	ing Roots	<u>Second</u> Sur Dra Oxi (C3) (V Cra Sat Gee FAG	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2) C-Neutral Test (D5)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimen Drift Dep Algal Ma Iron Dep Inundati X Water-S	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial Stained Leaves (B9)	: one requir Imagery (	ed; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where Presence Thin Muc	bly) t (B11) nvertebrat n Sulfide C son Water Rhizosph <b>not tilled</b> e of Reduc k Surface	es (B13) Odor (C1) Table (C2) eres on Liv ) eed Iron (C4 (C7)	ing Roots	<u>Second</u> Sur Dra Oxi (C3) (V Cra Sat Gee FAG	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimen Drift De Algal Ma Iron Dep Inundati X Water-S Field Obser	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial Stained Leaves (B9) vations:	i: one requir	red; check all that app Salt Crus Aquatic II Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7) Other (Ex	oly) at (B11) nvertebrat n Sulfide C son Water Rhizosph <b>not tilled</b> of Reduc k Surface cplain in R	es (B13) Odor (C1) Table (C2) eres on Liv ) ed Iron (C4 (C7) emarks)	ing Roots	<u>Second</u> Sur Dra Oxi (C3) (V Cra Sat Gee FAG	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2) C-Neutral Test (D5)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimen Drift Dej Algal Ma Iron Dep Inundati X Water-S Field Obser Surface Wat	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial Stained Leaves (B9) vations: ter Present?	: one requir Imagery ( Yes	ed; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7) Other (E)	oly) nvertebrat n Sulfide C con Water Rhizosph <b>not tilled</b> e of Reduc k Surface cplain in R	es (B13) Odor (C1) Table (C2) eres on Liv ) eed Iron (C4 (C7) emarks)	ing Roots	<u>Second</u> Sur Dra Oxi (C3) (V Cra Sat Gee FAG	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2) C-Neutral Test (D5)
Hydric s HYDROLO Wetland Hy Primary India Surface X High Wa X Saturati Water M Sedimer Drift Dej Algal Ma Iron Deg Inundati X Water-S Field Obser Surface Wat	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial Stained Leaves (B9) vations: ter Present? Present?	i: one requir Imagery ( Yes Yes	ed; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7)Other (Es	bly) t (B11) nvertebrat n Sulfide C con Water Rhizosph <b>not tilled</b> e of Reduc k Surface cplain in R nches):	es (B13) Odor (C1) Table (C2) eres on Liv ) eed Iron (C4 (C7) emarks)	ing Roots	Second Sur Spa Dra Oxi (C3) (v Cra Sat Gee Fro	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Hydric s HyDROLO Wetland Hy Primary India Surface X High Wa X Saturatia Water M Sedimen Drift Del Algal Ma Iron Dep Inundati X Water-S Field Obser Surface Wate Water Table Saturation P (includes cal	drology Indicators cators (minimum of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial stained Leaves (B9) vations: ter Present? Present? pillary fringe)	i: one requir Imagery ( Yes Yes Yes	ed; check all that app Salt Crus Aquatic I Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7) Other (E)	bly) t (B11) nvertebrat n Sulfide C con Water Rhizosph <b>not tilled</b> e of Reduc k Surface cplain in R nches): <u></u> nches): <u>4</u>	es (B13) Odor (C1) Table (C2) eres on Liv ) eed Iron (C4 (C7) emarks)	ing Roots	Second Sur Sur Dra Oxi (C3) (v Cra Cra Cra Cra Fro Sat Fro	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) <b>where tilled</b> ) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) pmorphic Position (D2) C-Neutral Test (D5)

Remarks:

Primary wetland hydrology indicators A2, A3 and B9 observed. Surface water ponding nearby in linear depression next to stormwater outfall.

Project/Site: THRO - South Unit	City/County: 1	/ledora/Billings		_ Sampling Date: 7/20/20
Applicant/Owner: <u>NPS</u>			State: ND	_ Sampling Point: DP2-South
Investigator(s): Jeff Gray	Section, Towr	nship, Range: <u>S2</u>	7, T140 N, R102	2 W
Landform (hillslope, terrace, etc.): floodplain	Local relief (c	oncave, convex,	none): <u>none</u>	Slope (%): <u>0-1</u>
Subregion (LRR): LRR G Lat: 46	.916896	Long:	-103.525745	Datum: WGS 84
Soil Map Unit Name: Havre silt loam, 0-2 percent slopes, occasionally t	flooded		NWI classi	fication: <u>No</u>
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes X	No (	If no, explain in	Remarks.)
Are Vegetation, Soil, or Hydrology significantly	/ disturbed?	Are "Normal	Circumstances'	' present? Yes X No
Are Vegetation, Soil, or Hydrology naturally pr	oblematic?	(If needed, e	xplain any answ	vers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling	point locatio	ns, transect	s, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes <u>X</u> Yes Yes	No No _X No _X	Is the Sampled Area within a Wetland?	Yes	No <u>X</u>
Remarks:					

DP2-South located in upland north of Wetland 1 and visitor center in cottonwood stand in Little Missouri River floodplain. Not all three wetland indicators present.

2014	Absolute	Dominant		Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. Fraxinus pennsylvanica	10	Yes	FAC	That Are OBL, FACW, or FAC	( <b>a</b> )
2. Populus deltoides	30	Yes	FAC	(excluding FAC-): <u>3</u>	(A)
3				Total Number of Dominant	
4				Species Across All Strata: 5 (	(B)
	40	= Total Cov	ver	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )				That Are OBL, FACW, or FAC: <u>60</u> (	(A/B)
1. Fraxinus pennsylvanica	25	Yes	FAC		
2. Symphoricarpos occidentalis	30	Yes	UPL	Prevalence Index worksheet:	
3				Total % Cover of:Multiply by:	
4				OBL species x 1 =	
5.				FACW species x 2 =	
		= Total Cov		FAC species x 3 =	
Herb Stratum (Plot size: <sup>5' d.</sup> )			ei	FACU species x 4 =	
1. Bromus inermis	40	Yes	UPL	UPL species x 5 =	
2				Column Totals: (A)	
					(-)
3				Prevalence Index = B/A =	
4				Hydrophytic Vegetation Indicators:	
5				1 - Rapid Test for Hydrophytic Vegetation	
6				2 - Dominance Test is >50%	
7				$\_$ 3 - Prevalence Index is ≤3.0 <sup>1</sup>	
8				4 - Morphological Adaptations <sup>1</sup> (Provide suppo	ortina
9				data in Remarks or on a separate sheet)	Jung
10				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	)
	10	= Total Cov	ver		·
Woody Vine Stratum (Plot size: 15' d. )				<sup>1</sup> Indicators of hydric soil and wetland hydrology mu	Jst
1. <u>-</u>				be present, unless disturbed or problematic.	
2				Hydrophytic	
		= Total Cov	ver	Vegetation	
% Bare Ground in Herb Stratum <u>60</u>				Present? Yes X No	
Remarks:					
Hydrophytic vegetation indicator prese	nt (Dom	inance <sup>-</sup>	Γest).		

(inches)	Matrix	0/		x Features		1 2	Tautom	Demostic-
· · · ·	Color (moist)	<u>%</u>	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture	Remarks
	5Y 4/3	- 80					clay	no redox features
2.5	5Y 5/3	20						
		· ·						
		· ·						
Type: C=Conce	ntration, D=Dep	letion, RM=Re	duced Matrix, CS	=Covered	l or Coate	d Sand Gi	rains. <sup>2</sup> Lo	cation: PL=Pore Lining, M=Matrix.
lydric Soil Indic	ators: (Applic	able to all LR	Rs, unless other	wise note	əd.)		Indicators	s for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)			Sandy G	Bleyed Ma	trix (S4)		1 cm	Muck (A9) ( <b>LRR I, J</b> )
Histic Epiped	lon (A2)			Redox (S5)				Prairie Redox (A16) (LRR F, G, H)
Black Histic (			Stripped	Matrix (S	6)		Dark	Surface (S7) (LRR G)
Hydrogen Su	Ilfide (A4)		Loamy M	Aucky Min	eral (F1)		High I	Plains Depressions (F16)
	ers (A5) ( <b>LRR F</b>	,	Loamy (	Gleyed Ma	atrix (F2)		(Ll	RR H outside of MLRA 72 & 73)
	49) ( <b>LRR F, G</b> , I		·	d Matrix (F	,			ced Vertic (F18)
	ow Dark Surfac	e (A11)		Dark Surfa				Parent Material (TF2)
Thick Dark S				d Dark Su				Shallow Dark Surface (TF12)
	/ Mineral (S1)	~~~~~~		Depressior				(Explain in Remarks)
	y Peat or Peat (			ins Depre				s of hydrophytic vegetation and
5 cm Mucky	Peat or Peat (S	3) ( <b>LRR F</b> )	(ML)	RA 72 & 7	3 of LRR	H)		nd hydrology must be present,
Destrictive Leve	* (if procent);						unies	s disturbed or problematic.
Restrictive Laye	r (if present):							
Туре:			_					Y
Depth (inches	):		_				Hydric Soi	l Present? Yes No X
Remarks:								
	oil indicat	ors prese	ent.					
No hydric s								
-								
•								
YDROLOGY	ogy Indicators:							
YDROLOGY Wetland Hydrolo		ne required: c	heck all that apply	()			Second	ary Indicators (minimum of two required
YDROLOGY Wetland Hydrolo Primary Indicator	s (minimum of o	ne required; c						
YDROLOGY Vetland Hydrolo Primary Indicator Surface Wate	<u>s (minimum of o</u> er (A1)	ne required; c	Salt Crust	(B11)	e (B13)		Su	face Soil Cracks (B6)
YDROLOGY Wetland Hydrold Primary Indicator Surface Wate High Water T	<u>s (minimum of o</u> er (A1) <sup>-</sup> able (A2)	ne required; c	Salt Crust	(B11) vertebrates			Sui Spa	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A	s (minimum of o er (A1) Table (A2) (3)	ne required; c	Salt Crust Aquatic Inv Hydrogen	(B11) vertebrate: Sulfide Oc	lor (C1)		Sui Spa Dra	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks	s (minimum of o er (A1) Table (A2) (B1)	ne required; c	Salt Crust Aquatic Inv Hydrogen = Dry-Seaso	(B11) vertebrate: Sulfide Oc n Water T	lor (C1) able (C2)		Sui Spi Dra Ox	face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3
YDROLOGY Vetland Hydrolo Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De	s (minimum of o er (A1) Table (A2) .3) (B1) posits (B2)	ne required; c	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R	(B11) vertebrate: Sulfide Oc n Water T thizospher	lor (C1) able (C2)	ng Roots	Sui Spa Dra Ox (C3) (1	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposite	s (minimum of o er (A1) <sup>a</sup> able (A2) (3) (B1) posits (B2) s (B3)	ne required; c	Salt Crust Aquatic Inv Hydrogen 3 Dry-Seaso Oxidized R (where r	(B11) vertebrate: Sulfide Oc n Water T thizospher <b>not tilled</b> )	lor (C1) Table (C2) res on Livi	-	Sui Spa Dra Ox (C3) (1	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8)
YDROLOGY Wetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or	s (minimum of o er (A1) Table (A2) (B1) (B1) (Posits (B2) s (B3) Crust (B4)	ne required; c	Salt Crust Aquatic Inv Hydrogen S Dry-Seaso Oxidized R Oxidized R Presence o	(B11) vertebrates Sulfide Oc n Water T thizospher <b>not tilled</b> ) of Reduce	dor (C1) Table (C2) res on Livi d Iron (C4	-	Sui Spi Dra Ox (C3) (1 Cra Sat	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9)
YDROLOGY  Vetland Hydrold  Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits	s (minimum of o er (A1) Table (A2) (B1) (B1) (posits (B2) s (B3) Crust (B4) s (B5)		Salt Crust Aquatic Inv Hydrogen 3 Dry-Seaso Oxidized R Oxidized R Presence c Thin Muck	(B11) vertebrates Sulfide Oc n Water T thizospher not tilled) of Reduce Surface (f	dor (C1) able (C2) res on Livi d Iron (C4 C7)	-	Sui Spi Dra Ox (C3) (1 Cra Sai Ge	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Inundation V	s (minimum of o er (A1) Table (A2) (B1) posits (B2) s (B3) Crust (B4) s (B5) isible on Aerial I		Salt Crust Aquatic Inv Hydrogen S Dry-Seaso Oxidized R Oxidized R Presence o	(B11) vertebrates Sulfide Oc n Water T thizospher not tilled) of Reduce Surface (f	dor (C1) able (C2) res on Livi d Iron (C4 C7)	-	(C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1) (C3) (C3) (1) (C3) (C3) (C3) (C3) (C3) (C3) (C3) (C3)	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5)
YDROLOGY  Vetland Hydrold  Primary Indicator  Surface Wate High Water T  Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Inundation V Water-Staine	s (minimum of o er (A1) Table (A2) (B1) (B1) posits (B2) s (B3) Crust (B4) s (B5) isible on Aerial I ed Leaves (B9)		Salt Crust Aquatic Inv Hydrogen 3 Dry-Seaso Oxidized R Oxidized R Presence c Thin Muck	(B11) vertebrates Sulfide Oc n Water T thizospher not tilled) of Reduce Surface (f	dor (C1) able (C2) res on Livi d Iron (C4 C7)	-	(C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1) (C3) (C3) (1) (C3) (C3) (C3) (C3) (C3) (C3) (C3) (C3)	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Inundation V Water-Staine Field Observatio	s (minimum of o er (A1) Table (A2) (B1) posits (B2) s (B3) Crust (B4) s (B5) isible on Aerial I ed Leaves (B9)	magery (B7)	Salt Crust Aquatic Inv Hydrogen : Dry-Seaso Oxidized R Oxidized R Presence o Thin Muck Other (Exp	(B11) vertebrates Sulfide Oc n Water T hizospher <b>not tilled</b> ) of Reduce Surface (i lain in Re	dor (C1) able (C2) res on Livi d Iron (C4 C7) marks)	)	(C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1) (C3) (C3) (1) (C3) (C3) (C3) (C3) (C3) (C3) (C3) (C3)	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Inundation V Water-Staine Field Observatio	s (minimum of o er (A1) Table (A2) (B1) (B1) (B1) (B3) Crust (B2) s (B3) Crust (B4) s (B5) isible on Aerial I ed Leaves (B9) ons: esent? Y	magery (B7) es No	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R (where r Presence c Thin Muck Other (Exp X Depth (inc	(B11) vertebrate: Sulfide Oc n Water T thizospher <b>not tilled</b> ) of Reduce Surface ( lain in Re	dor (C1) res on Livi d Iron (C4 C7) marks)	.) 	(C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1) (C3) (C3) (1) (C3) (C3) (C3) (C3) (C3) (C3) (C3) (C3)	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5)
YDROLOGY Vetland Hydrold Primary Indicator Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Inundation V	s (minimum of o er (A1) Table (A2) (B1) (B1) (B1) (B3) Crust (B2) s (B3) Crust (B4) s (B5) isible on Aerial I ed Leaves (B9) ons: esent? Y	magery (B7)	Salt Crust Aquatic Inv Hydrogen Dry-Seaso Oxidized R (where r Presence c Thin Muck Other (Exp X Depth (inc	(B11) vertebrate: Sulfide Oc n Water T thizospher <b>not tilled</b> ) of Reduce Surface ( lain in Re	dor (C1) res on Livi d Iron (C4 C7) marks)	.) 	(C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1 (C3) (1) (C3) (C3) (1) (C3) (C3) (C3) (C3) (C3) (C3) (C3) (C3)	rface Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C3 where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5)

Remarks:

No wetland hydrology indicators present.

 Saturation Present?
 Yes \_\_\_\_\_ No X \_\_\_\_ Depth (inches): \_\_\_\_\_\_
 Wetland Hydrole

 (includes capillary fringe)
 Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Project/Site: THRO - South Unit	City/County: Med	dora/Billings	Sampling Date: 7/20/20
Applicant/Owner: NPS		State: ND	Sampling Point: DP3-South
Investigator(s): Jeff Gray	Section, Townsh	nip, Range: <u>S27, T140 N, R102 V</u>	W
Landform (hillslope, terrace, etc.): <u>floodplain</u>			Slope (%): <u>1-2</u>
Subregion (LRR): LRR G Lat: 46	.916547	Long: -103.524150	Datum: WGS 84
Soil Map Unit Name: Havre silt loam, 0-2 percent slopes, occasionally	flooded	NWI classific	ation: No
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X	No (If no, explain in R	emarks.)
Are Vegetation, Soil, or Hydrology significantly	y disturbed?	Are "Normal Circumstances" p	oresent? Yes X No
Are Vegetation, Soil, or Hydrology naturally pr	oblematic?	(If needed, explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	a samplina po	oint locations. transects	. important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	No <u>X</u> No <u>X</u> No X	Is the Sampled Area within a Wetland?	Yes	No	
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Remarks:

DP3-South located in upland grass swale east of East River Road near maintenance building. Not all three wetland indicators present.

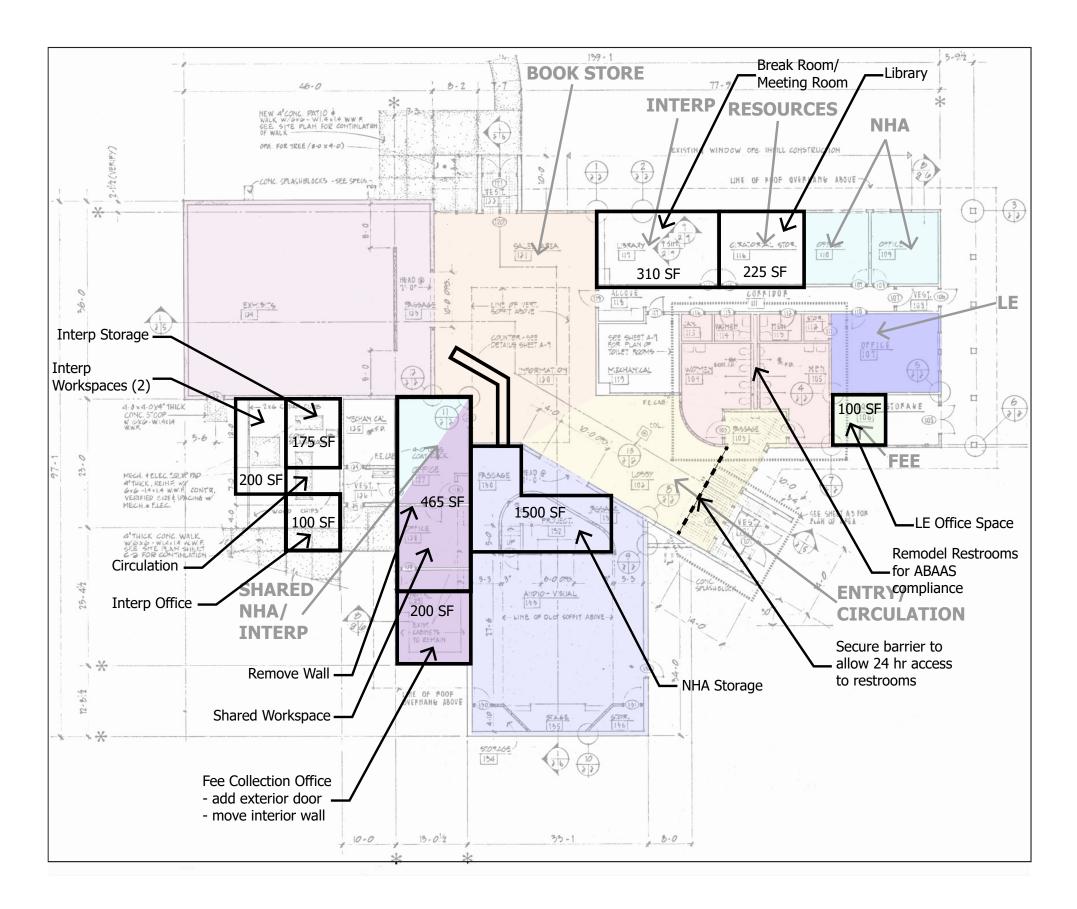
	Absolute	Dominant		Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30' d.</u> )		Species?		Number of Dominant Species	
1. <u>-</u>				That Are OBL, FACW, or FAC	( • )
2				(excluding FAC-):	(A)
3				Total Number of Dominant	
4				Species Across All Strata: 1	(B)
	0	= Total Co	/er	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15' d. )					(A/B)
1. <u>-</u>				Dravelance Index worksheets	
2				Prevalence Index worksheet:	
3				Total % Cover of: Multiply by	
4				OBL species x 1 =	
5				FACW species x 2 =	
		= Total Co	/er	FAC species x 3 =	
Herb Stratum (Plot size: 5' d. )				FACU species x 4 =	
1. Bromus inermis	95	Yes	UPL	UPL species x 5 =	
2. Poa pratensis	5	No	FACU	Column Totals: (A)	(B)
3					
4				Prevalence Index = B/A =	
5				Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetatio	n
				2 - Dominance Test is >50%	
7				3 - Prevalence Index is ≤3.0 <sup>1</sup>	
8				4 - Morphological Adaptations <sup>1</sup> (Provide	supporting
9				data in Remarks or on a separate she	
10	400			Problematic Hydrophytic Vegetation <sup>1</sup> (Ex	(plain)
Woody Vine Stratum (Plot size: 15' d)	100	= Total Co	/er	<sup>1</sup> Indicators of hydric soil and wetland hydrolo	av must
				be present, unless disturbed or problematic.	g)
1				Under altratic	
2		= Total Co		Hydrophytic Vegetation	
% Bare Ground in Herb Stratum 0	<u> </u>		ver	Present? Yes No $\frac{X}{X}$	_
Remarks:					
No hydrophytic vegetation indicator pr	ocont (N	ominan		) Plot dominated by smooth bro	me
	esent (D	ominan		j. i lot dominated by smooth bit	
(UPL).					

SOIL	
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Depth <u>Matrix</u>		oth needed to document the indicator or conf Redox Features				,			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
0-10	10YR 3/2	70	-	-	-	-	clay	no redox features	
	2.5 Y 4/3	30							
10-12	10YR 4/2	96	10YR 4/6	4	c	m	clay		
12-16	2.5Y 4/3	100	-			-	silty clay		
	<u> </u>							·	
			<u>.</u> .						
	<u></u>		_						
	Concentration, D=De					ed Sand G		cation: PL=Pore Lining, M=Matrix.	
-	Indicators: (Applie	cable to a						s for Problematic Hydric Soils <sup>3</sup> :	
Histoso	<b>、</b> ,			y Gleyed N				Muck (A9) (LRR I, J)	
	pipedon (A2) listic (A3)		-	/ Redox (S ed Matrix (				Prairie Redox (A16) ( <b>LRR F, G, H</b> )	
	en Sulfide (A4)				ineral (F1)		Dark Surface (S7) (LRR G) High Plains Depressions (F16)		
	ed Layers (A5) (LRR	F)		y Gleyed N	. ,		-	RR H outside of MLRA 72 & 73)	
	uck (A9) (LRR F, G,	,		ted Matrix				ced Vertic (F18)	
Depleted Below Dark Surface (A11) Redox Dark Surface (F6)					Parent Material (TF2)				
Thick D	ark Surface (A12)		Deple	ted Dark S	urface (F7)	)	Very \$	Shallow Dark Surface (TF12)	
	Mucky Mineral (S1)			x Depressi	( )			(Explain in Remarks)	
	Mucky Peat or Peat				ressions (F			s of hydrophytic vegetation and	
5 cm M	ucky Peat or Peat (S	63) ( <b>LRR F</b>	F) (N	ILRA 72 &	73 of LRR	R H)		nd hydrology must be present,	
Restrictive	Layer (if present):						unies	s disturbed or problematic.	
11001101140	Euger (in present).								
Туре: _	nches)						Hydric Soi	I Present? Yes No X	
Type: <u>-</u> Depth (ir	nches):						Hydric Soi	I Present? Yes No $\frac{X}{2}$	
Туре: _							Hydric Soi	l Present? Yes No X	
Type: <u>-</u> Depth (ir Remarks:	nches): <u>-</u>			ground su	face but do	pesn't mee		I Present? Yes <u>No X</u> s requirement (6") for indicator F3 or A	
Type: <u>-</u> Depth (ir Remarks: No hydric so	nches): <u>-</u> bil indicators present			ground su	face but do	pesn't mee			
Type: <u>-</u> Depth (ir Remarks: No hydric so	nches): <u>-</u> bil indicators present	. Depleted		ground su	face but do	pesn't mee			
Type: <u>-</u> Depth (ir Remarks: No hydric sc IYDROLC Wetland Hy	nches): <u>-</u> bil indicators present DGY ydrology Indicators	. Depletec	l layer at 10" below		face but do	pesn't mee	et the thicknes	s requirement (6") for indicator F3 or A	
Type: <u>-</u> Depth (ir Remarks: No hydric so <b>IYDROLC</b> Wetland Hy Primary Ind	nches): <u>-</u> bil indicators present DGY /drology Indicators icators (minimum of	. Depletec	l layer at 10" below ed; check all that ap	ply)	rface but do	oesn't mee	et the thicknes	s requirement (6") for indicator F3 or A	
Type: <u>-</u> Depth (ir Remarks: No hydric so IYDROLO Wetland Hy Primary Ind Surface	nches): <u>-</u> bil indicators present DGY ydrology Indicators icators (minimum of Water (A1)	. Depletec	l layer at 10" below ed; check all that ap Salt Cru:	ply) st (B11)		oesn't mee	et the thicknes <u>Second</u>	s requirement (6") for indicator F3 or A ary Indicators (minimum of two required	
Type: <u>-</u> Depth (ir Remarks: No hydric so IYDROLC Wetland Hy Primary Ind Surface High W	nches): <u>-</u> bil indicators present DGY ydrology Indicators icators (minimum of the Water (A1) later Table (A2)	. Depletec	l layer at 10" below ed; check all that ap Salt Cru Aquatic	ply) st (B11) Invertebrat	es (B13)	pesn't mee	Second	s requirement (6") for indicator F3 or A lary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8)	
Type: <u>-</u> Depth (ir Remarks: No hydric so IYDROLO Wetland Hy Primary Ind Surface	nches): <u>-</u> bil indicators present DGY ydrology Indicators icators (minimum of the Water (A1) later Table (A2)	. Depletec	Hayer at 10" below ed: check all that ap Salt Cru Aquatic Hydroge	<u>ply)</u> st (B11) Invertebrat	es (B13) Ddor (C1)		Second	s requirement (6") for indicator F3 or A ary Indicators (minimum of two required	
Type: Depth (ir Remarks: No hydric so Wetland Hy Primary Ind Surface High W Saturat Water N	nches): <u>-</u> bil indicators present DGY /drology Indicators icators (minimum of water (A1) iater Table (A2) ion (A3) Marks (B1)	. Depletec	ed; check all that ap <u></u>	ply) st (B11) Invertebrat n Sulfide ( son Water	es (B13) Ddor (C1) Table (C2)		Second Second Su Spa Dra Oxi	s requirement (6") for indicator F3 or A ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C	
Type: Depth (ir Remarks: No hydric so IYDROLO Wetland Hy Primary Ind Surface High W Saturat Saturat Sedime	nches): <u>-</u> bil indicators present DGY ydrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2)	. Depletec	l layer at 10" below ed: check all that ap Salt Cru Aquatic Hydroge	ply) st (B11) Invertebrat n Sulfide ( son Water	es (B13) Ddor (C1) Table (C2)		Second <u>Second</u> <u>Second</u> <u>Spa</u> Dra <u>Can</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u> <u>Spa</u>	s requirement (6") for indicator F3 or A lary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C where tilled)	
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Type: Depth (ir Remarks: No hydric so IYDROLO Wetland Hy Primary Ind Surface High W Saturat Vater N Sedime Naturat 	bil indicators present DGY /drology Indicators icators (minimum of 2 Water (A1) 2 Water (A1) 2 Water (A1) 2 Water (A2) 2 ion (A3) Marks (B1) 2 ent Deposits (B2) 2 eposits (B3) 2 lat or Crust (B4) 2 posits (B5) 2 ion Visible on Aerial 2 Stained Leaves (B9) 7 vations: 1 ter Present? 2 Present? 2 posital (A2) 2 posital (A2) 2 posital (A2) 2 posital (B3) 2 posital (B4) 2 posi	. Depleted	ed; check all that ap Salt Cru: Salt Cru: Aquatic Dry-Sea Oxidizeo (where Presenc Thin Mu B7) Other (E No X Depth ( No X Depth (	ply) st (B11) Invertebrat In Sulfide ( son Water I Rhizosph e not tilled e of Reduc ck Surface inches): inches): inches):	es (B13) Ddor (C1) Table (C2) eres on Liv I) eed Iron (C4 (C7) eemarks)	ing Roots 4) Wet	Et the thickness	s requirement (6") for indicator F3 or A ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) ainage Patterns (B10) idized Rhizospheres on Living Roots (C where tilled) ayfish Burrows (C8) turation Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5) bst-Heave Hummocks (D7) (LRR F)	

## APPENDIX D FACILITY DIAGRAMS

### FIGURE D.1 MEDORA AREA VISITOR CENTER REMODEL FACILITY DIAGRAM (CONCEPT A & B)



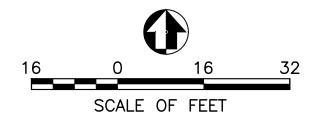
Appendix D

### Facility Revitalization Plan and Environmental Assessment THRO 258662

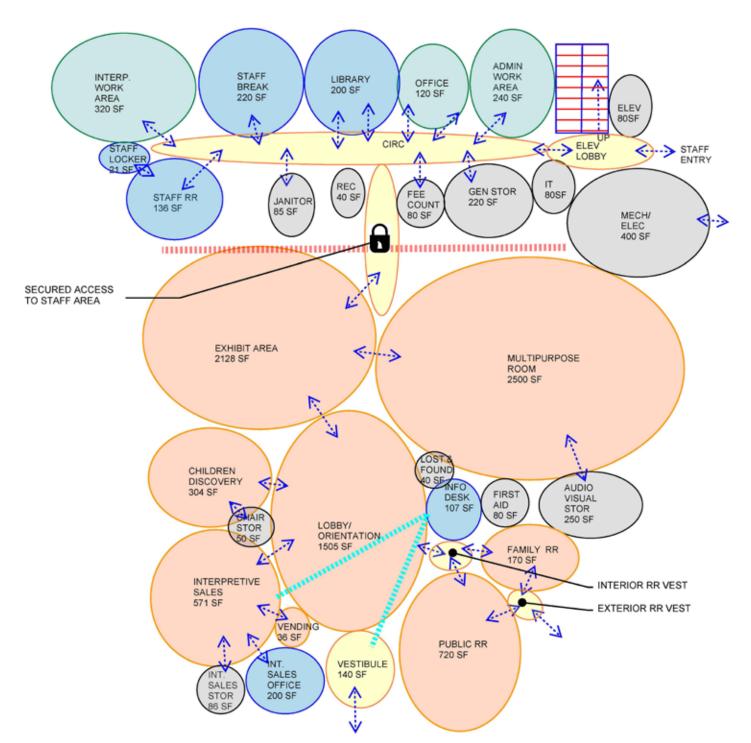


Medora Visitor Center Facility Needs:

- 1 Private Office for Fee Collection
- Expanded Shared Workspace at Desk
- 1 Private Office and Storage for Interp
- 1 Storage Room for NHA
- Meeting Room/ Breakroom
- Expanded, Secured, Curatorial Space
- Sight Lines from the Desk to Entry
- First Aide Station
- Storm Shelter?



### FIGURE D.2 MEDORA AREA NEW VISITOR CENTER/ ADMIN BUILDING FACILITY DIAGRAM (CONCEPT C)



LEVEL 1

### Facility Revitalization Plan and **Environmental Assessment** THRO 258662

### Legend

COMMON STAFF AREAS PUBLIC AREAS UTILITY ROOMS STAFF ROOM/ OFFICE COMMON AREA CIRCULATION SIGHT LINE CONNECTION ...... ACCESS CONNECTION

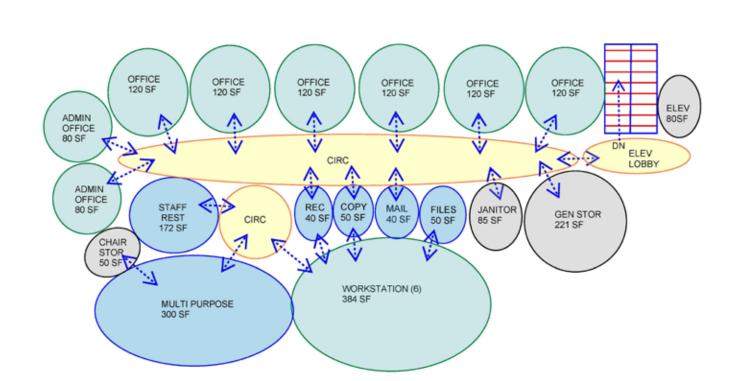
LINE OF SECURED STAFF AREA



NOT TO SCALE

### FIGURE D.3 MEDORA AREA NEW VISITOR CENTER/ ADMIN BUILDING FACILITY DIAGRAM (CONCEPT C)







### Facility Revitalization Plan and **Environmental Assessment** THRO 258662

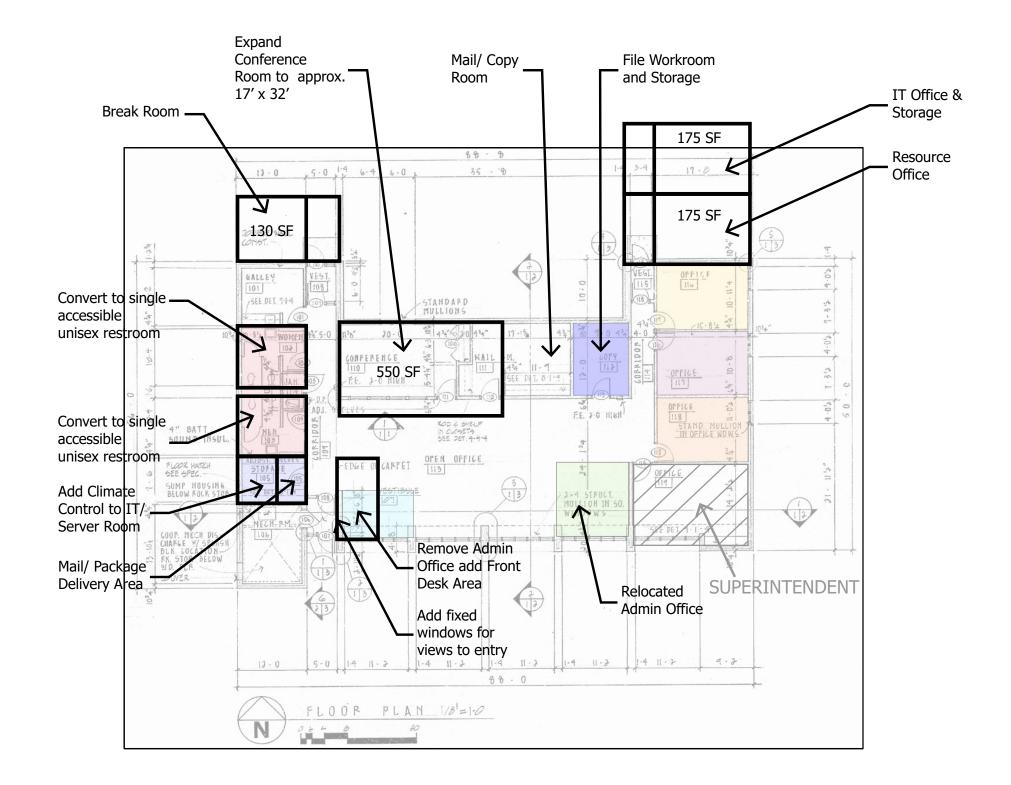
### Legend

- COMMON STAFF AREAS PUBLIC AREAS UTILITY ROOMS STAFF ROOM/ OFFICE COMMON AREA CIRCULATION SIGHT LINE CONNECTION ..... ACCESS CONNECTION
- LINE OF SECURED STAFF AREA



### NOT TO SCALE

### FIGURE D.4 MEDORA AREA ADMIN BUILDING REMODEL FACILITY DIAGRAM (CONCEPT A)

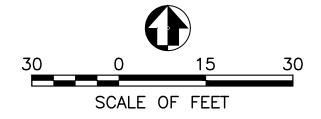


### Facility Revitalization Plan and Environmental Assessment THRO 258662

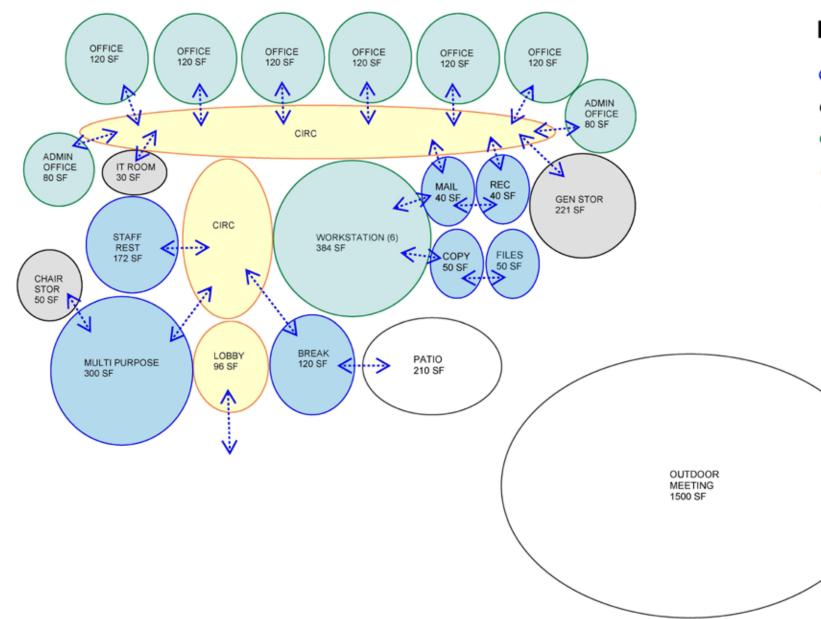


Admin Building Facility Needs Summary:

- 1 Additional Room (File Workroom)
- Fully Climate Controlled IT Room
- Break Room
- Expanded or Expandable Conference Room, and Storage
- Accessible Restrooms
- Clear View of Building Approach from Front Desk
- Mail/ Package Delivery Area
- Additional Restroom near Offices
- Secure space for IDs, Keys, Badges
- Collaboration Room (from Wendy's Office)
- Waiting Area



### FIGURE D.5 MEDORA AREA NEW ADMIN BUILDING FACILITY DIAGRAM (CONCEPT B)



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### Legend

$\bigcirc$	COMMON STAFF AREAS
$\bigcirc$	UTILITY ROOMS
$\bigcirc$	STAFF ROOM/ OFFICE
$\bigcirc$	CIRCULATION
<>	ACCESS CONNECTION

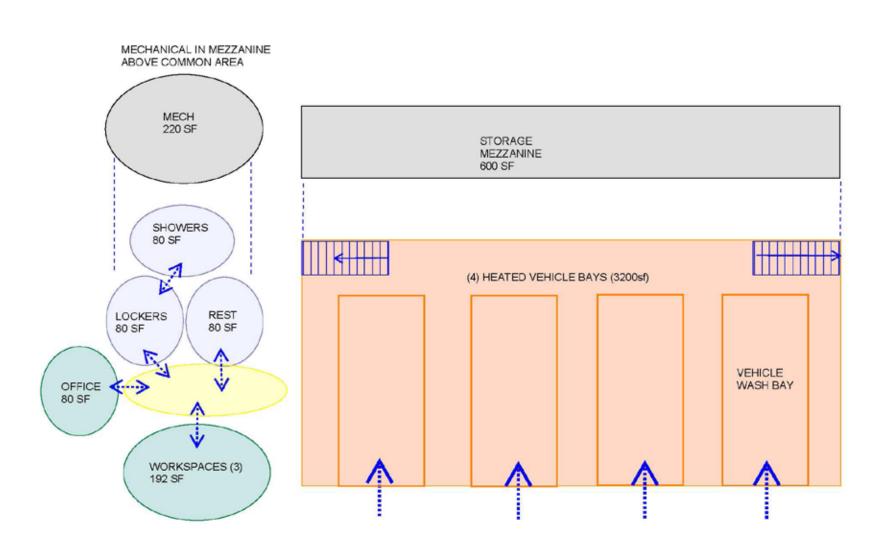


NOT TO SCALE

### FIGURE D.6 MEDORA AREA HEATED MAINTENANCE BUILDING FACILITY DIAGRAM (CONCEPTS A & B)

THEODORE ROOSEVELT NATIONAL PARK

HEATED VEHICLE BAY (OPT 1) - PROGRAMING DIAGRAM - 3.24.2021



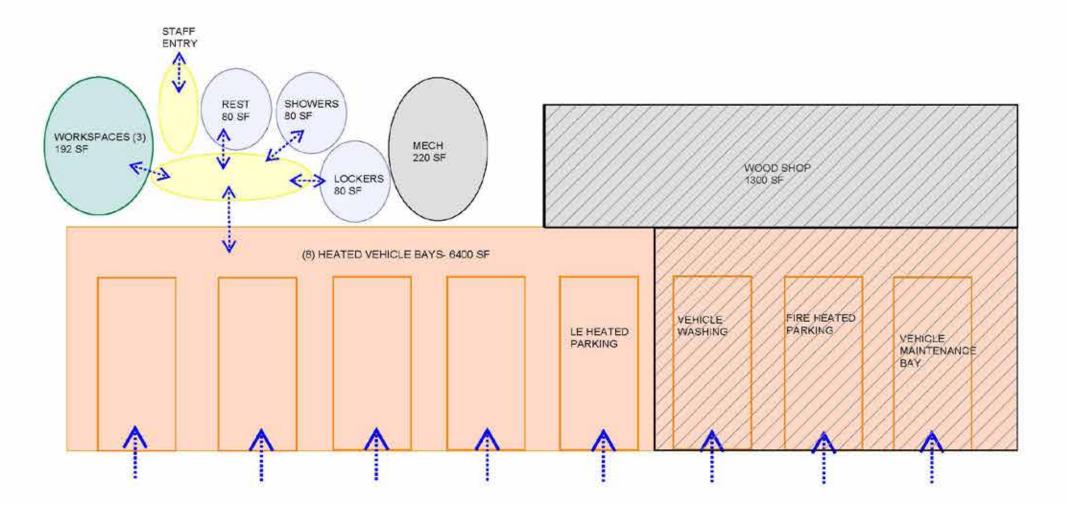
### LEGEND

HEATED BAYS UTILITY ROOM STAFF ROOM/ OFFICE COMMON AREA CIRCULATION TOTAL 4,532 SF

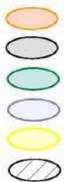
### FIGURE D.7 MEDORA AREA HEATED MAINTENANCE BUILDING FACILITY DIAGRAM (CONCEPT C)

THEODORE ROOSEVELT NATIONAL PARK

HEATED VEHICLE BAY (OPT 3) - PROGRAMING DIAGRAM - 3.24.2021



### LEGEND



HEATED BAYS

UTILITY ROOM

STAFF ROOM/ OFFICE

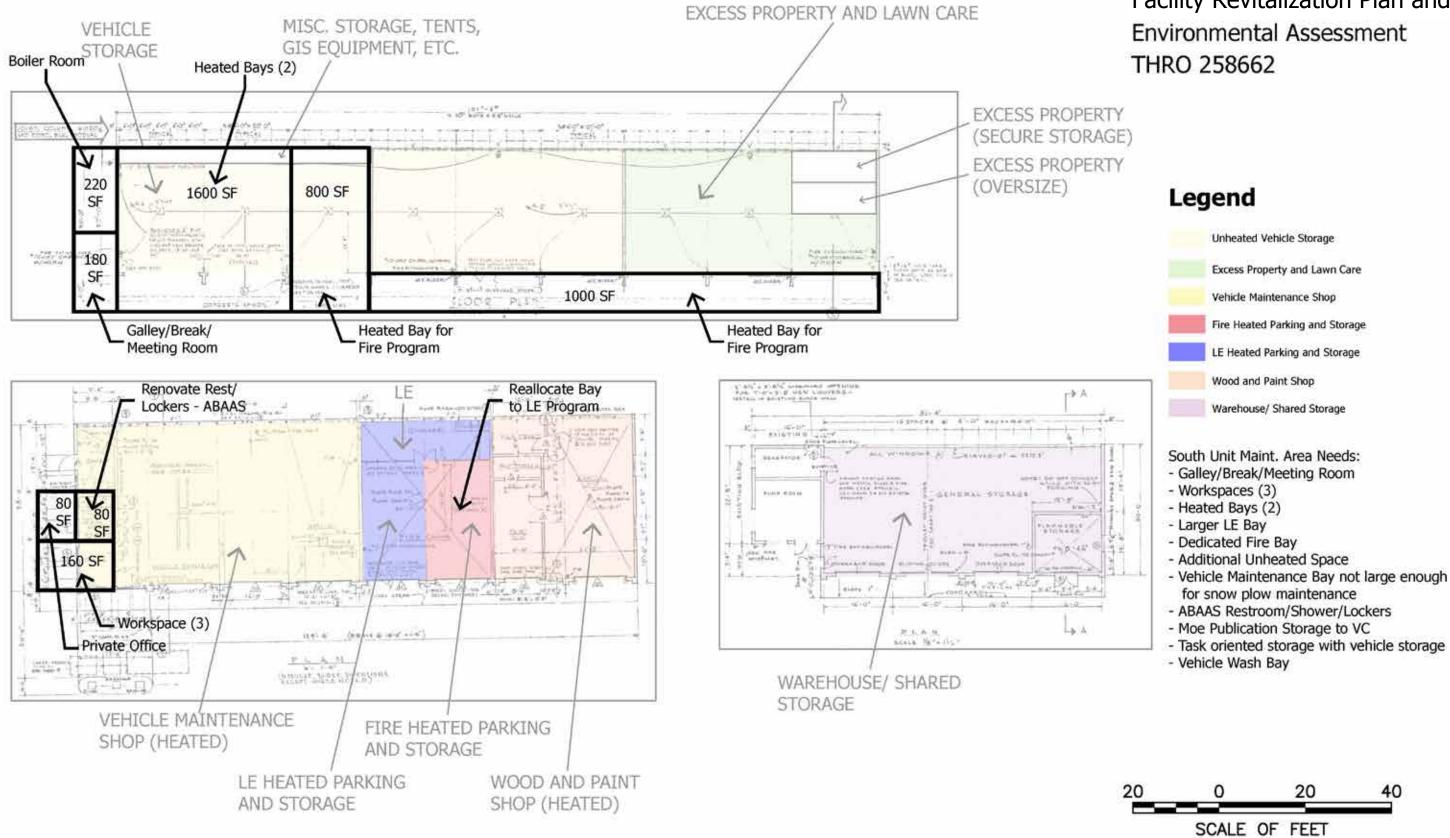
COMMON AREA

CIRCULATION

AREAS REPLACING EXISTING BUILDING FUNCTIONS

TOTAL 8,552 SF

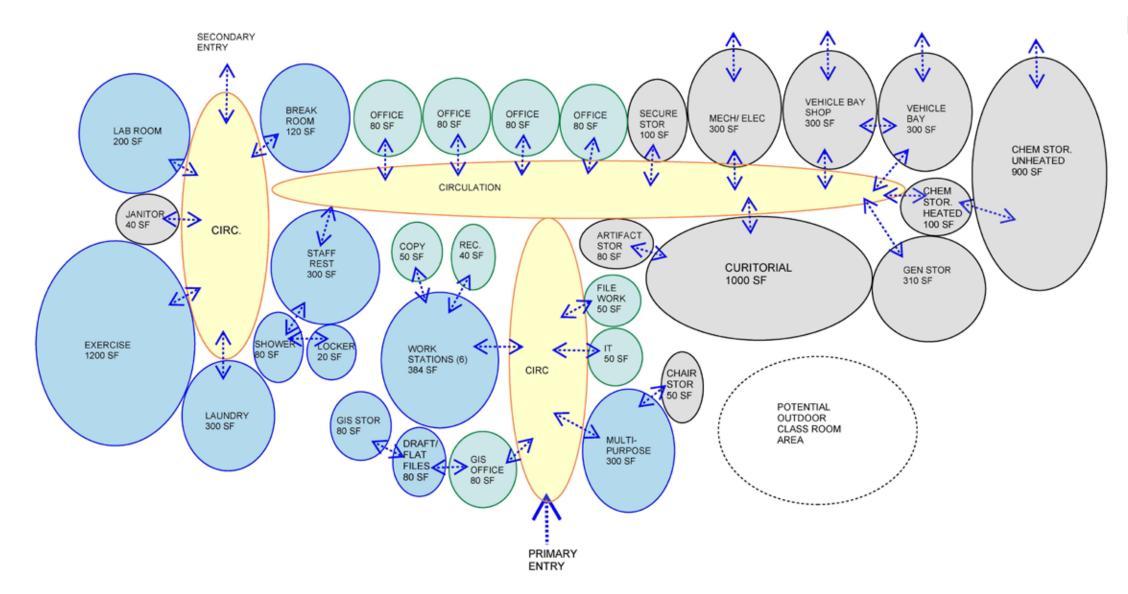




# Facility Revitalization Plan and

- Task oriented storage with vehicle storage

### FIGURE D.9 MEDORA AREA RESOURCES BUILDING FACILITY DIAGRAM (CONCEPT A)



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### Legend

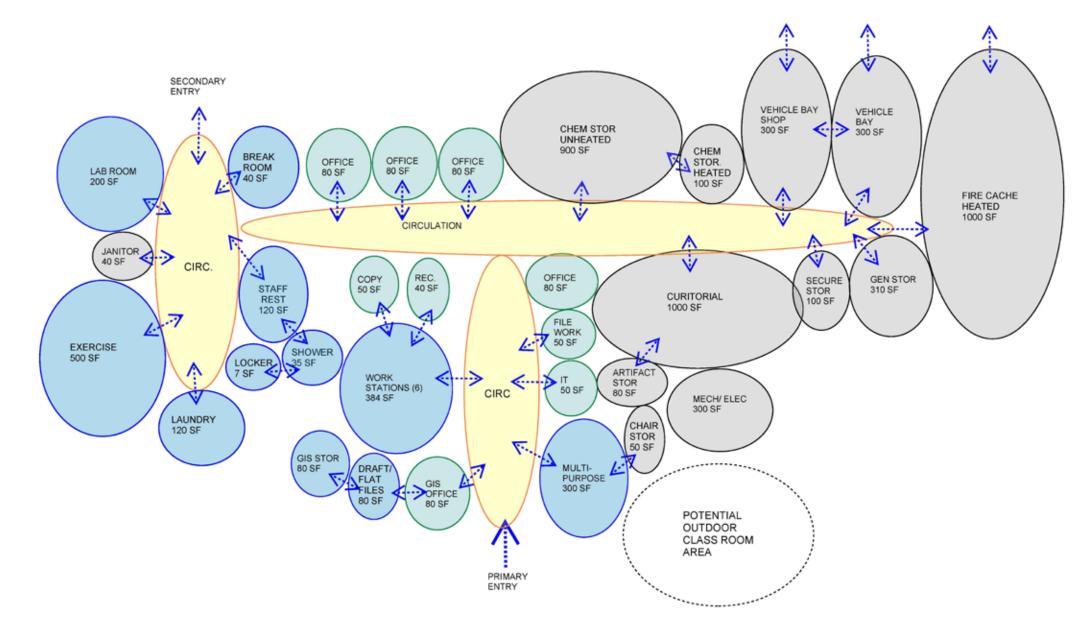
 $\langle \rangle$ 

- COMMON STAFF AREAS
- UTILITY ROOMS
- STAFF ROOM/ OFFICE
  - CIRCULATION
  - ACCESS CONNECTION



### NOT TO SCALE

### FIGURE D.10 MEDORA AREA RESOURCES BUILDING FACILITY DIAGRAM (CONCEPT B)



### Facility Revitalization Plan and Environmental Assessment THRO 258662

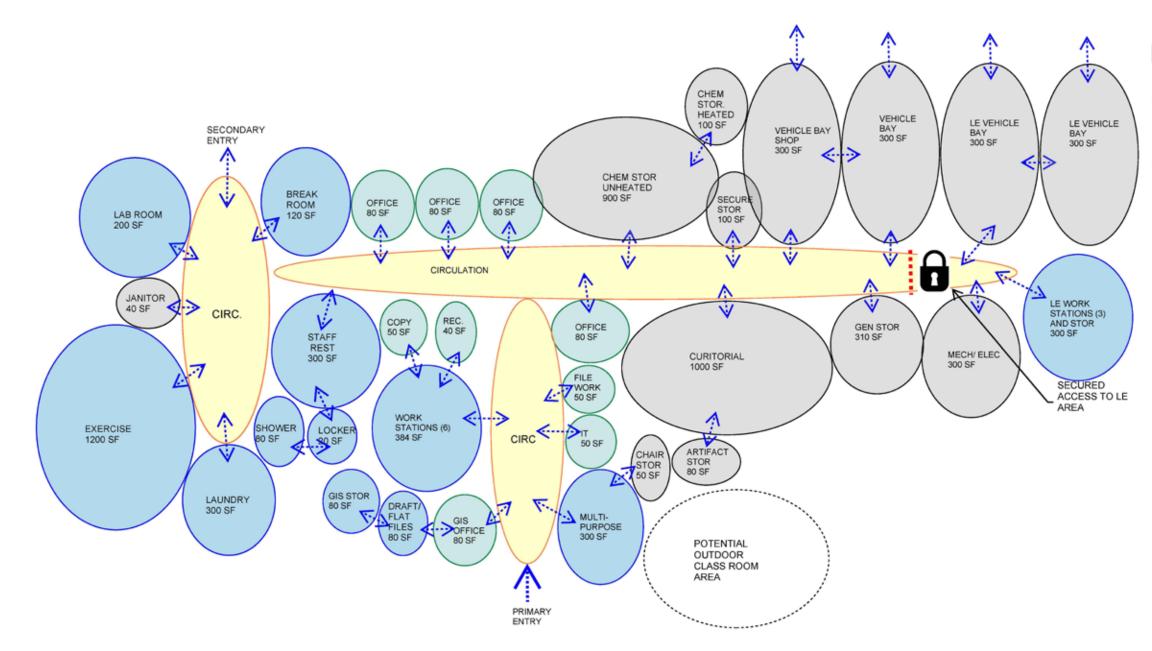
### Legend

- COMMON STAFF AREAS
- UTILITY ROOMS
- STAFF ROOM/ OFFICE
- CIRCULATION
- ACCESS CONNECTION



### NOT TO SCALE

### FIGURE D.11 MEDORA AREA RESOURCES BUILDING FACILITY DIAGRAM (CONCEPT C)



### Facility Revitalization Plan and Environmental Assessment THRO 258662

### Legend

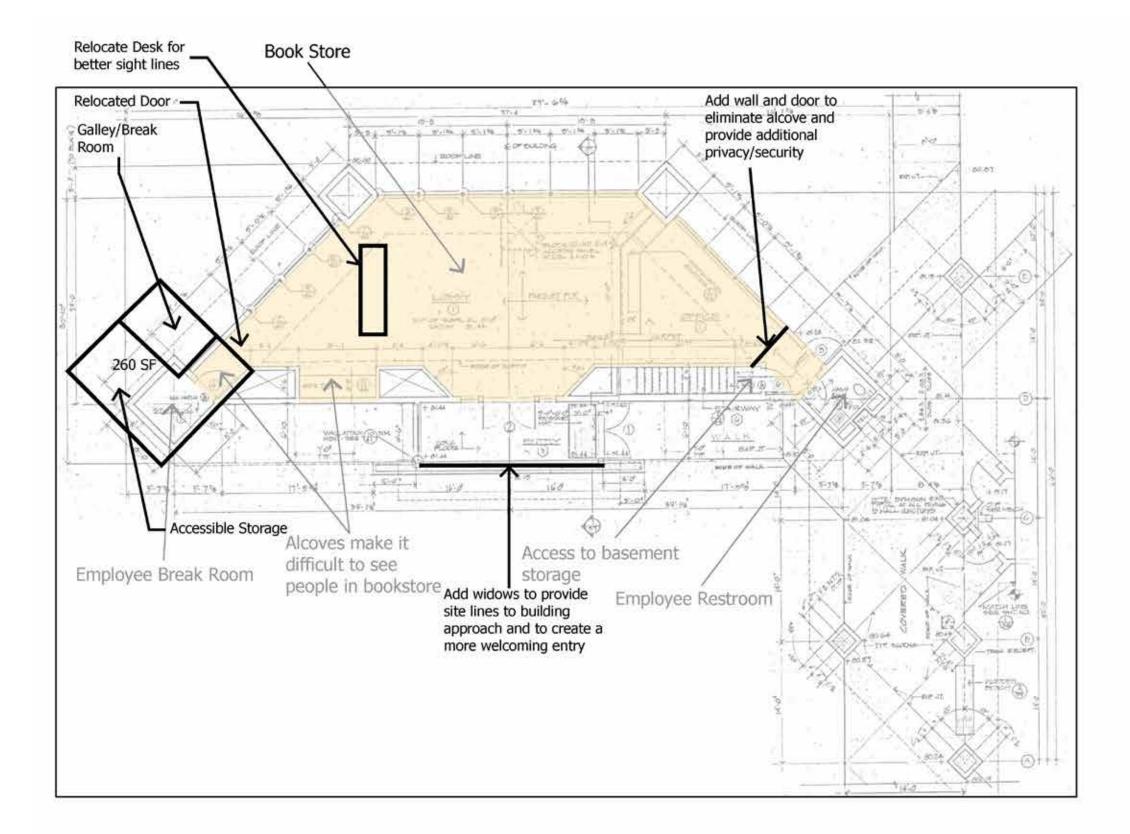
<u></u>

- COMMON STAFF AREAS
- UTILITY ROOMS
- STAFF ROOM/ OFFICE
  - CIRCULATION
  - ACCESS CONNECTION



### NOT TO SCALE

### FIGURE D.12 PAINTED CANYON VISITOR CENTER REMODEL FACILITY DIAGRAM



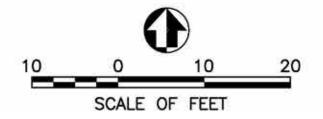
### Facility Revitalization Plan and Environmental Assessment THRO 258662



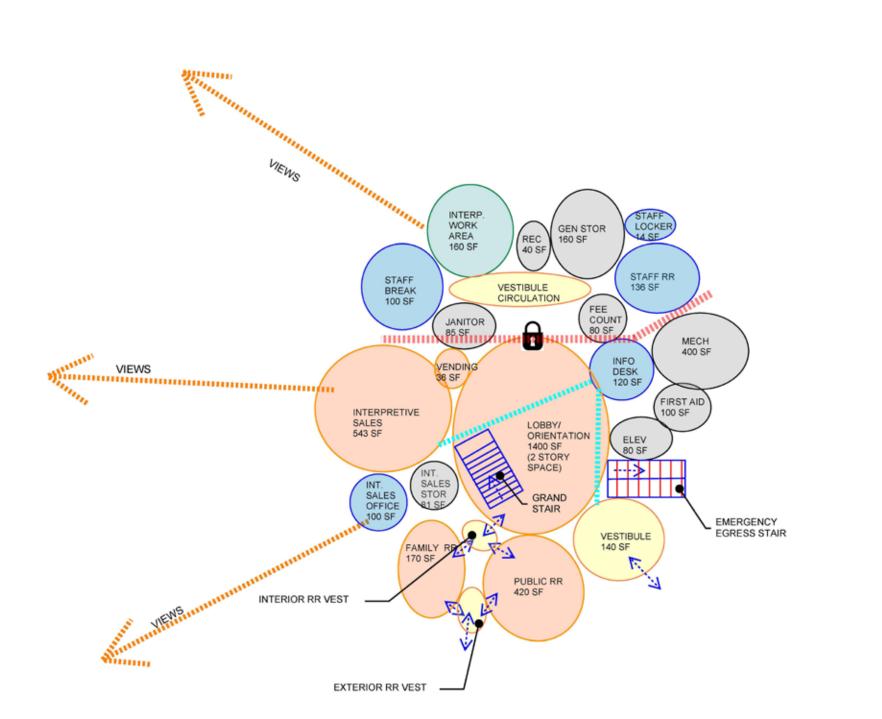
Book Store

Painted Canyon Visitor Center Needs:

- Accessible Storage
- Galley/ Break Room/ Meeting Room
- Site Lines to Building Approach
- Minimize Nooks in Bookstore
- Physical Separation for BOH spaces
- Multi-Purpose Gateway, Inter-Agency, Libary,
- Medora
- Arch. Overlook



### FIGURE D.13 PAINTED CANYON NEW VISITOR CENTER FACILITY DIAGRAM



LEVEL 1

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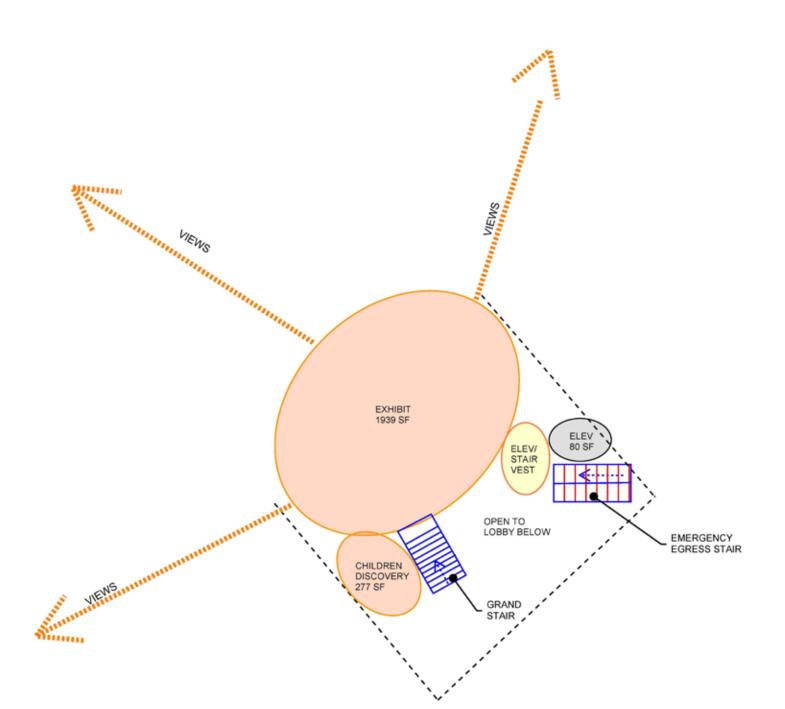
### Legend

$\supset$	COMMON STAFF AREAS
	PUBLIC AREAS
$\supset$	UTILITY ROOMS
$\supset$	STAFF ROOM/ OFFICE
$\supset$	COMMON AREA
	CIRCULATION
	SIGHT LINE CONNECTION
$\sim$	ACCESS CONNECTION
	LINE OF SECURED STAFF AREA

Level 1	4,565 SF
Level 2	2,646 SF
Total	7,211 SF



### FIGURE D.14 PAINTED CANYON NEW VISITOR CENTER FACILITY DIAGRAM



LEVEL 2

### Facility Revitalization Plan and **Environmental Assessment** THRO 258662

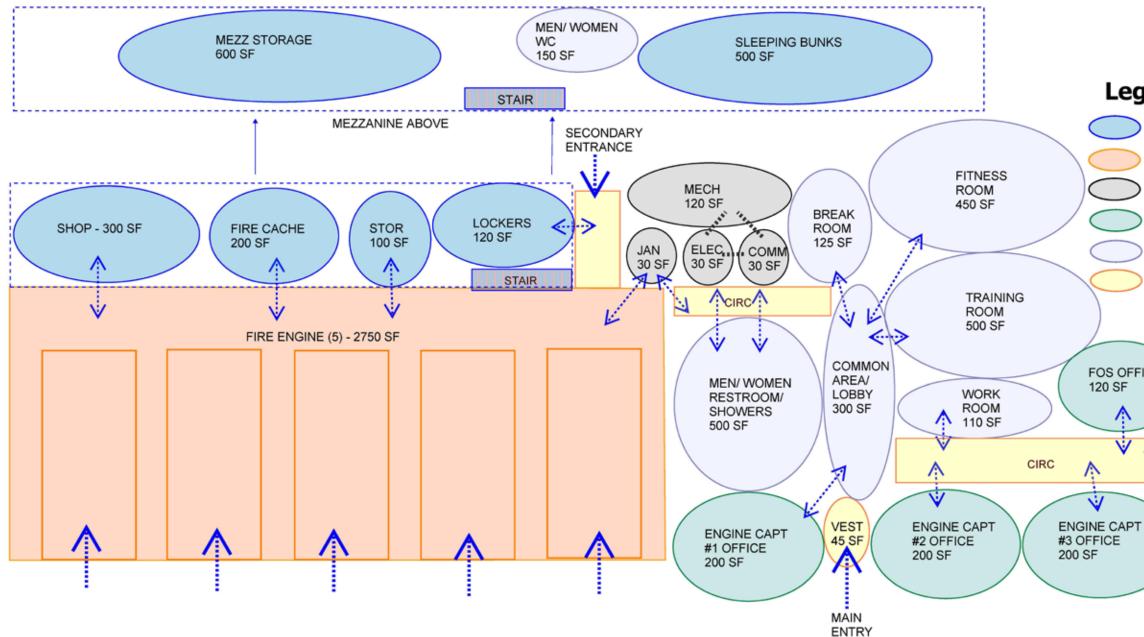
### Legend

COMMON STAFF AREAS PUBLIC AREAS UTILITY ROOMS STAFF ROOM/ OFFICE COMMON AREA CIRCULATION ...... SIGHT LINE CONNECTION ACCESS CONNECTION 

LINE OF SECURED STAFF AREA



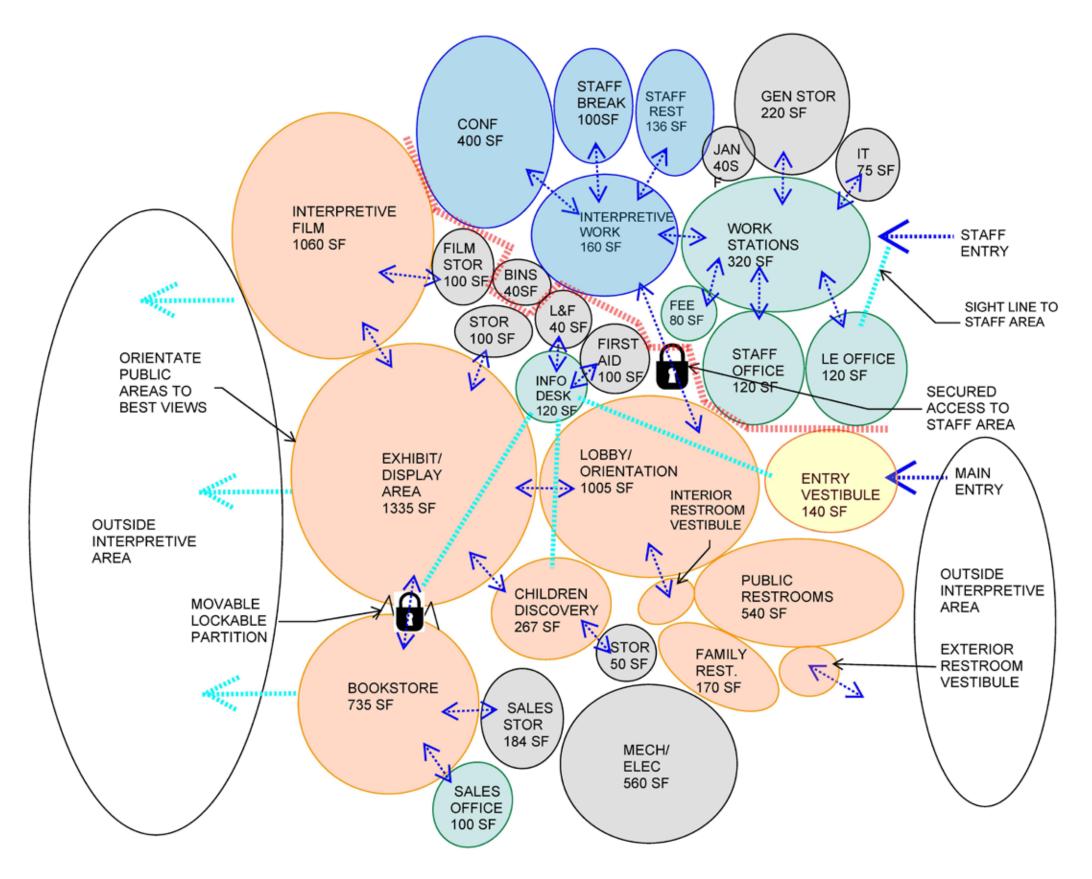
### FIGURE D.15 PAINTED CANYON INTERAGENCY FIRE CENTER FACILITY DIAGRAM



### Facility Revitalization Plan and Environmental Assessment THRO 258662

### Legend ROOMS RELATED TO ENGINE ROOM ENGINE ROOM UTILITY ROOM STAFF ROOM/ OFFICE COMMON AREA CIRCULATION FOS OFFICE 120 SF ENGINE CAPT 小 #5 OFFICE 4.7 Ŵ 200 SF ENGINE CAPT #4 OFFICE 200 SF

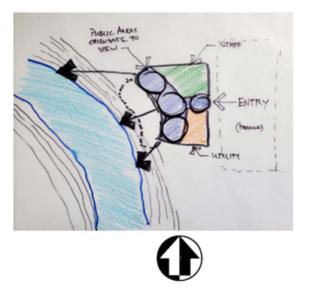
### FIGURE D.16 NORTH UNIT VISITOR CENTER FACILITY DIAGRAM



### Facility Revitalization Plan and Environmental Assessment THRO 258662

### Legend

$\bigcirc$	COMMON STAFF AREAS
$\bigcirc$	PUBLIC AREAS
$\bigcirc$	UTILITY ROOMS
$\bigcirc$	STAFF ROOM/ OFFICE
$\bigcirc$	COMMON AREA
$\bigcirc$	CIRCULATION
	SIGHT LINE CONNECTION
$\langle \rangle$	ACCESS CONNECTION
	LINE OF SECURED STAFF AREA





THRO 387 182922 National Park Service U.S. Department of the Interior