

**Environmental Assessment**

**City of Sidney 300-Ft Guyed Telecommunications Tower  
Approximately .6 miles North of Hwy 30 on Haskell Hill Rd  
Sidney, Cheyenne County, Nebraska**

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## **EXECUTIVE SUMMARY**

This executive summary is provided for convenience only and should not substitute review of the complete report, including all figures and appendices.

The Proposed Action is identified as the City of Sidney Tower site (Tower site). The Sidney Tower is classified as a “New” Transmission and Receiving Site, which consists of the proposed construction of a 300-foot guyed communications tower with associated equipment to be located on a 8-foot by 16-foot pad . The total ground disturbance is less than .25 acres. A vicinity map of the area and photographs of the site and surrounding area are in the figures and appendices of this report.

The proposed tower site is located at 41° 9' 12.18" latitude, 102° 59' 17.30" longitude, approximately 3,300 ft north of Highway 30, 2.2 miles west of Highway 385 as shown on the vicinity map. (Figure 1)

The proposed Tower site will be located within the city limits of Sidney Nebraska in Cheyenne County. An existing gravel access road as shown in the on site photos, will be used for site access for construction and operations maintenance. (Figures 3-9)

The proposed site will allow for the following:

- Increased coverage area for emergency responders connected through the system
- Updates equipment to support new frequencies to improve and expand voice and data coverage
- Facilitate reliable interoperable communications among first responder organizations
- Enhanced security and facility control

The proposed Action will not involve any unusual risks or impacts to sensitive areas identified in Section 4. Therefore the proposed Action would warrant the issuance of a FONSI.

In addition to Public Safety Interoperable Communications (PSIC) Grant Program screening any new tower construction is required to undergo FCC NEPA Land Use Screening in accordance with 47 CFR Section 1.1307 (a) (1) through (8), to determine whether any of the listed FCC special interest items would be significantly affected if a tower structure and/or antenna and associated equipment control cabinets were constructed at the proposed site location.

## **SECTION 1 – INTRODUCTION**

This Environmental Assessment (EA) provides a review of the potential environmental impacts associated with grant funds issued by the Public Safety Interoperable Communications (PSIC) Grant Program, administered by the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce. The PSIC Grant Program is to assist State, local, tribal, and nongovernmental agencies in developing interoperable communications as they leverage newly available spectrum in the 700-800 megahertz (MHz) band. As a condition of the PSIC Grant Program, PSIC grantees must comply with all relevant Federal legislation, including the National

Environmental Policy Act (NEPA). Given the height and guy-wired structure of the proposed City of Sidney tower, this project requires a site-specific EA under the PSIC Grant Program.

The NTIA has specified that PSIC-funded projects must be used for projects that would improve communications in areas at high risk for natural disasters and in urban and metropolitan areas at high risk for threats of terrorism, and should include pre-positioning or securing of interoperable communications for immediate deployment during emergencies or major disasters. Investments that received PSIC funding range from large-scale infrastructure build outs such as tower construction to governance-related initiatives, but not limited to multijurisdictional strategic planning.

Cheyenne County, Nebraska is located in the southwest portion of the State of Nebraska. In 2009, the U.S. Census Bureau estimated Cheyenne County's population to be 9, 720. The county has a land area of 1,196.34 square miles.

The proposed Sidney Tower site is located approximately .6 miles North of Hwy 30 on Haskell Hill Rd in Cheyenne County, Nebraska at 41° 9' 12.18" latitude, 102° 59' 17.30" longitude. The City of Sidney Tower site consists of a proposed 300-foot guyed telecommunication tower and associated equipment to be located on a graveled lease parcel. The proposed telecommunication compound will include: one 8-foot by 16-foot equipment shelter, a standalone emergency backup generator

The proposed project will utilize existing utilities for power from an existing electrical transmission pedestal. An existing gravel access road will be used for site access for construction and operations maintenance.

## **Purpose and Need**

The purpose of the Proposed Action is to meet current radio system coverage and future coverage needs of Cheyenne and nearby surrounding counties. The Purpose of the PSIC Grant Program is to improve interoperability and reliability in the nation's communications and information systems infrastructure by assisting public safety agencies in performing the following:

- Conducting Statewide or regional planning and coordination
- Supporting the design and engineering of interoperable emergency communications systems.
- Supporting the acquisition or deployment of interoperable communications equipment or systems
- Establishing and implementing a strategic technology reserve to pre-position or secure interoperable communications in advance so they may be immediately deployed in an emergency or major disaster.

The proposed project is a new tower construction in Cheyenne County. There is currently not an existing communications and information systems infrastructure which meets the coverage and

security needs of Cheyenne and surrounding counties. Therefore, the proposed Tower site location will provide the following:

- Increased coverage area for emergency responders connected through the communications and information systems of neighboring counties
- Updated equipment to support new frequencies to improve and expand voice and data coverage
- Facilitate reliable interoperable communications among first responder organizations
- Enhanced security and facility control
- Use cost-effective measures, via leasing agreements and system sharing

## **SECTION 2 – PROPOSED ACTION**

The Proposed Action is the construction of a new transmission and receiving telecommunications facility at the City of Sidney Tower site. The City of Sidney Tower project is classified as a “New” Transmission and Receiving Site under the PSIC Grant Program. The Proposed Action consists of a 300-foot guyed wire telecommunications tower within a 50-foot by 50-foot graveled lease parcel with associated equipment. The total ground disturbance area is less than 0.25 acres. The area surrounding the proposed undertaking is located in the City of Sidney in Cheyenne County, Nebraska.

The proposed tower site is located at 41° 9' 12.18" latitude, 102° 59' 17.30" longitude. An existing gravel access road will be used for site access for construction and operations maintenance. The proposed telecommunications compound will include one 8-foot by 16-foot equipment shelter, a standalone emergency backup generator.

The proposed project will be located on property owned by the City of Sidney. The existing utilities for power will be overhead electrical transmission lines extended from an existing electrical transmission pedestal located 300 feet east of the site

The proposed City of Sidney Tower site will allow for the following:

- Increased coverage area for emergency responders connected through the communications information's systems of neighboring countries
- New technology which will support frequencies which improve/expand voice and/or data coverage.
- Improve communications among security/emergency organizations
- Enhance security and facility control
- Use cost-effective measures, via leasing agreements and systems sharing

## **Alternatives**

Several project alternatives were investigated during the facility selection process as discussed below:

### **Proposed Action – City of Sidney Tower Site (Preferred Action)**

The proposed tower site will be existing graveled parcel .6 miles North of Hwy 30 on Haskell Hill Rd in Cheyenne County, Nebraska.

The new structure will utilize an existing graveled access road for site access for construction/operations maintenance. The proposed telecommunications compound will include: one 8-foot by 16-foot equipment shelter, a standalone emergency generator. The proposed site topography provides natural height resulting in enhanced coverage with the proposed 300-foot guyed tower. This greatly reduces the retrofitting that would be required otherwise. The proposed site also provides for additional future expansion to help minimize the number of new towers needed. Ingress and egress would be more conducive to maintenance and future expansion construction work. The proposed site will enhance facility and facility control, reliable interoperable communications, and significant increased coverage for security and emergency service entities.

### **No Action**

The no Action alternative would not meet the current radio system coverage requirements causing serious limitation on security and emergency response, funding for interoperable communications and information systems infrastructure would not be released, and infrastructure would neither be developed nor enhanced. Ongoing maintenance activities would continue using the current funding sources; however, no new activities would be funded with PSIC grant funding. It is assumed that the project proposed for PSIC grant funding would not go forward with any alternative funding sources.

The no Action Alternative will serve as the baseline for assessing the impacts of the other alternatives. The No Action Alternative would not address the needs for Cheyenne County and surrounding areas.

### **Alternatives Considered But Not Carried Forward**

Multiple alternatives were examined to determine the range of reasonable alternatives to implement the Proposed Action. No existing facility that would require minimum structural retrofitting of an existing tower and other equipment upgrades is available. The proposed site provides a technically appropriate area to locate this facility. Within this area, and extremely limited number of sites from which to choose were amiable to pursue.

Consideration of existing tower locations in the area and accounting for the future needs of Cheyenne County and surrounding areas did not meet the pre-screen requirements: increase coverage area for emergency responders, new technology which will support frequencies which improve/expand voice and/or data coverage, improve communications among security/emergency organizations, enhance security and facility control, and use cost-effective measures, via leasing agreements and systems sharing. Therefore, these alternative locations were considered but not carried forward

## **SECTION 3 – EXISTING ENVIRONMENT**

This section describes the existing environment that may be affected by implementing the Proposed Action and serves as a baseline from which to identify and evaluate potential impacts. The description of the affected environment focuses on those resource areas that are potentially subject to impacts resulting from the proposed action describes the existing environment that may be affected by implementing the Proposed Action and serves as a baseline from which to identify and evaluate potential impacts. The description of the affected environment focuses on those resource areas that are potentially subject to impacts resulting from the Proposed Action. Aspects of the existing environment described in this section focus on 11 major resource areas that encompass the natural, human, and built environments. The 11 resource areas are noise, air quality, geology and soils, water resources, biological resources, historic and cultural, land use, aesthetic and visual, infrastructure, socioeconomic resources, and human health and safety.

### **Resource 1 – Noise**

Noise is defined as unwanted sound that interferes with normal human activities or wildlife behavior, or may otherwise diminish environmental quality (EPA, 1974). Noise can come from a number of sources and at varying frequencies and may be continuous or intermittent, persistent or occasional. Noise and sound share the same physical aspects; however, noise is generally considered a disturbance, whereas sound is defined as a particular auditory effect produced by a given source (e.g., a motor running). How sound is interpreted, as either pleasant (e.g., birdsong) or unpleasant (e.g., jackhammer), depends upon the listener's current activity, past experience, and attitude toward the source. The measurement and perception of sound involve two physical characteristics: intensity and frequency. Intensity is a measure of the strength or magnitude of the sound vibrations and is expressed in terms of pressure. The higher the sound pressure, the more intense is the perception of that sound. The frequency of the sound is the number of times per second the sound oscillates. Sirens and screeches typify high frequency sounds, whereas low frequency sounds are characterized as a rumble or roar (EPA, 1974). The sound pressure range that can be detected comfortably by the human ear is extremely large and covers an intensity scale from 1 to 100,000,000 (EPA, 1974). Because of this wide range of sound intensity, representation using linear index becomes difficult. As a result, the unit of A-weighted decibels ((abbreviated dB or sometimes dBA)-a logarithmic measure of the magnitude of a sound as the average person hears it 0 is normally utilized. Humans do not hear very low or very high frequencies. Nearly as well as they hear middle frequencies. Using a weighted corrects these relative inefficiencies of the human ear at low or higher frequencies.

#### **Existing Conditions**

In a typical day, most people are exposed to sound levels of 50 to 70 dBA. The project site is located in the city of Sidney, which more than likely, will be the typical noise level associated with the area.

## **Resource 2- Air Quality**

Air Quality is measured by the concentration of various pollutants in the atmosphere, usually expressed in units of parts per million (ppm) or micrograms per cubic meter (µg/m<sup>3</sup>). Acceptable levels for six criteria pollutants in ambient air have been established as National Ambient Air Quality Standards (NAAQS). These standards were set by the federal Environmental Protection Agency (EPA) for the maximum levels of air pollutants that can exist in the outdoor air without unacceptable effects on human health or the public welfare. The six criteria air pollutants include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb). PM<sub>10</sub> and PM<sub>2.5</sub> are acronyms for particulate matter consisting of particles smaller than 10 and 2.5 micrometers respectively.

### **Existing Conditions**

According to the Nebraska Department of Environmental Quality (NDEQ) and the most current document, "Nebraska Air Quality 2008" there was no "exceedances" in Cheyenne County and "demonstrates that Sidney's air quality is well within the limits established in the NAAQS". The proposed project meets established NAAQS, air permits are not required for new construction or refitting construction for telecommunication towers that include the following activities: building a road, preparing land to erect a tower, temporary small scale ground disturbance typically associated with new tower construction.

## **Resource 3 – Geology and Soils**

Geological resources are described as the geology, soils, and topography that characterize an area. The geology of an area refers specifically to the surface and near-surface materials of the earth and the processes that formed those materials. These resources are typically described in terms of regional or local geology, including mineral resources, earth materials, soil resources, and topography

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Soil resources also include prime and unique farmlands, which are protected under the Farmland Protection Act of 1981 (FPPA) (P.L. 97-98, 7 U.S. C. §4201). The FPPA applies to prime and unique farmlands and those that are of State and local importance. "Prime farmland" is defined as land that has the best combination of physical and chemical characteristics for successful production crops. "Unique" farmland is defined as land that is used for the production of certain high-value crops, such as citrus, tree nuts, olives and fruits. The Act requires Federal agencies to examine the potentially adverse effects to these resources before approving any action that would irreversibly convert farmlands to nonfarm uses.

## **Existing Conditions**

The proposed Action is located within the city of Sidney, Nebraska, at an elevation of 4200 feet. According to the United States Department of Agriculture, Soil Conservation Service (SCS) Soil Survey of the area of interest (AOI) in Cheyenne County, Nebraska, there are two predominate soil types present at the proposed site. Rosebud loam and Canyon-Rock outcrop. This study was derived using the online WSS tool located on the Soil Conservation Service website. A copy of the Custom Soil Resource Report produced by the online tool can be found in Appendix B. Further, the city of Sidney had previously commissioned Panhandle Drilling & Testing inc in 1992 to do a soil and foundation investigation (Appendix B) before building the water tower located at the project site. They performed core sampling and analysis to determine the specifications of the water tower footings.

The proposed Tower Site is located within the city limits of Sidney. In a letter dated the 15<sup>th</sup> of March, the Natural Resources Conservation Service (NRCS) has determined that our project is found to be cleared of Farmland Protection Policy Act (FPPA) significant concerns. (Appendix A) Further a Farmland Conversion Impact Rating form (AD-1006) would not need to be filled out.

## **Resource 4 – Water Resources**

Water resources done in consultation with Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA resources-such as lakes, rivers, streams, creeks, canals, and drainage ditches make up the surface hydrology of a given watershed. The term “waters of the United States” applies only to surface waters (including rivers, lakes, estuaries, coastal waters, and wetlands) used for commerce, recreation, industry, sources of fishing, and other purposes.

The Safe Drinking Water Act (SDWA) provides for the protection of public health by regulating the U.S. public drinking water supply (P.L. 93-23, 42 U.S.C. §300f). The SDWA aims to protect drinking water and its sources (e.g., rivers, lakes, reservoirs, springs, and groundwater wells) and authorizes EPA to establish national health-based standards for drinking water to protect against naturally occurring and man-made contaminants. Every public water system in the United States is protected by the SDWA. Under Section 1424(e) the SDWA prohibits Federal agencies from funding actions that would contaminate a sole-source aquifer or its recharge area. Any federally funded project (including those that are partially federally funded) with the potential to contaminate a designated sole-source aquifer is subject to review by EPA. EPA's regulations implementing the SDWA requirements are found in 40 CFR 141-149. Federal SDWA groundwater protection programs are generally implemented at the State level.

The Clean Water Act (CWA), as amended, is the primary Federal law in the United States regulating water pollution (P.L. 92-500, 33 U.S.C. §1251). The CWA regulates water quality of all discharges into “waters of the United States.” Both wetlands and “dry washes” (channels that carry intermittent or seasonal flow) are considered “waters of the United States.” Administered by EPA, the CWA protects and restores water quality using both water quality standards and technology-based effluent limitations. The EPA publishes surface water quality standards and toxic pollutant criteria at 40 Code of Federal Regulations (CFR) Part 131.

The CWA also established the National Pollution Discharge Elimination System (NPDES) permitting program (Section 402) to regulate and enforce discharges into waters of the United States. The NPDES permit program focuses on point-source outfalls associated with industrial wastewater and municipal sewage discharges. Congress has delegated to many States the responsibility to protect and manage water quality within their legal boundaries by establishing water quality standards and identifying waters not meeting these standards. States also manage the NPDES system.

The Coastal Zone Management Act of 1972 (CZMA) (16 U.S.C. §1451) provides States with the authority to determine whether activities of governmental agencies are consistent with federally approved State Coastal Zone Management Plans (CZMP). The intent of the CZMA is to prevent any additional loss of living marine resources, wildlife, and nutrient-enriched areas; alterations in ecological systems; and decreases in undeveloped areas available for public use.

Federal statutes, executive orders (EO), State statutes, and State agency regulations and directives protect water quality and the beneficial uses of water resources. EO 11988 (Floodplain Management) and EO 11990 (Protection of Wetlands) mandate the control of activities that indirectly influence water quality.

EO 11988 (Floodplain Management) requires Federal agencies to determine whether a Proposed Action would occur within a floodplain and to take action to minimize occupancy and modification of floodplains. A floodplain is defined as the lowlands and flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands. At a minimum, areas designated as floodplains are susceptible to 100-year floods.

### **Existing Conditions**

According to the USGS "Sidney Digital Map Beta" dated 2009 downloaded from the USGS Store (Figure 1) the Proposed Action is located within the city of Sidney. The site is approximately 4200 ft. elevation. There are no indications of wetlands, floodplains, coastal management zones, and wild or scenic rivers noted in the reviewed maps.

To complete this EA a FEMA FIRM map was located from the FEMA website for Sidney, NE. No flood plains are indicated. (Figure 2)

In preparation for this EA a letter was sent to the Department of the Army Corps of Engineers requesting a review of this project. In a reply dated April 4<sup>th</sup>, 2011, USACE indicates that no Section 404 impacts are present. (Appendix A)

In preparation for this EA a letter was sent to the North Platte Natural Resource District requesting a review of this project. In a reply dated April 5<sup>th</sup> 2011, SPNRD indicates "to the best of our knowledge are several hundreds of feet away from this location. We have searched our database and do not find any registered wells in close proximity". (Appendix A)

## **Resource 5 – Biological Resources**

Biological resources are animals, plants, and associated habitats that are native to an area, including threatened or endangered species. In general, biological resources can include native and introduced (non-native) plants that comprise the various habitats. Animals present in such habitats, and natural areas help support these plant and wildlife populations. Protected or sensitive biological resources include plant and animal species listed as threatened or endangered by U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), or a State. The following section describes categories of biological resources such as threatened and endangered species, wildlife, along with habitat and wetlands.

The Endangered Species Act (ESA) (16 U.S.C. §1531) requires Federal agencies to conserve endangered species by listing endangered and threatened species of plants and animals and designating the critical habitat for animal species. The ESA defines an endangered species as any species in danger of extinction throughout all or a significant area of its range and a threatened species as any species likely to become endangered in the near future. Under Section 7 of the ESA, Federal agencies, in consultation with USFWS or NMFS, must ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species (i.e., a listed species) or to result in the destruction or adverse modification of critical habitat, defined as a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and protection (USFWS, 2007). USFWS and NMFS are responsible for compiling official lists of threatened and endangered species. If a Proposed Action may adversely affect a listed species or critical habitat, the Federal agency must prepare a Biological Assessment (BA) and initiate a formal consultation with USFWS or NMFS. After reviewing the BA, USFWS or NMFS prepares a Biological Opinion stating whether the Proposed Action is likely to jeopardize the continued existence of a listed species or cause the destruction or adverse modification of critical habitat. The purpose of the consultation process is to ensure avoidance and minimization of potential adverse impacts on listed species or critical habitats. Formal consultation is not required if the Federal agency determines, and USFWS or NMFS concurs in writing, that the Proposed Action is not likely to adversely affect listed species. In addition, the ESA prohibits all persons subject to U.S. jurisdiction, including Federal agencies, from, among other things “taking” endangered or threatened species. The “taking” prohibition includes any harm or harassment, and applies in the United States and on the high seas.

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §703) was first enacted to implement the 1916 convention between the United States and Great Britain for the protection of birds migrating between the U.S. and Canada, offering much-needed protection to many bird species during a time when commercial trade in birds and their feathers was popular. The statute makes it unlawful to pursue, hunt, take, capture, kill or sell birds listed in the statute as “migratory birds”, and does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs and nests. The MBTA is the primary law that affirms or implements the nation’s commitment to four international conventions (with Canada, Japan,

Mexico, and Russia) for the protection of a shared migratory bird resource. Each convention protects selected species of birds that are common to both countries (e.g., they occur in both countries at some point during their annual life cycle). The potential impact to property owners can exist when migratory birds seek respite within trees or on buildings considered private property.

EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) strengthens the protection of migratory birds and their habitats by directing Federal agencies to take certain actions that implement the MBTA. Specifically, Federal agency actions that have, or are likely to have, a measurable negative effect on migratory bird populations require development and implementation of an Memorandum of Understanding (MOU) with USFWS that promotes the conservation of migratory bird populations. The EO and MOUs are the regulatory basis for conservation actions or renewal of contracts, permits, delegations, or other third-party agreements associated with migratory birds. MOUs established under EO 13186 are published in the Federal Register.

USFWS's Division of Migratory Bird Management established several initiatives in the past decade to research collisions of birds with communication towers. In 1999, USFWS established the Communication Tower Working Group, composed of government, industry, and academic groups to study and determine tower construction approaches that prevent bird strikes.

EO 11990 (Protection of Wetlands) requires Federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetland habitat and to preserve and enhance the natural and beneficial values of wetland habitats in carrying out the agency's responsibilities. Wetland habitats generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds.

### **Existing Conditions**

The Proposed Action is located in Sidney Nebraska approximately .6 miles north of Highway 30 on Haskell Hill Rd. A visual inspection of the site revealed no burrows, nests, wetlands, coastal areas or signs of potential habitat of threatened or endangered species.

A formal letter was written to USFWS on March 11, 2011. In a response dated March 16<sup>th</sup> (Appendix A) they state they do not anticipate any impacts to federally listed species or their habitat.

A formal letter was also sent out to the Nebraska Game and Park Commission (NGPC) on March 16<sup>th</sup>. In a response dated April 6<sup>th</sup> (Appendix A) they state that the project described is not likely to adversely affect state-listed or threatened or endangered species.

### **Resource 6 – Historic and Cultural Resources**

Historic and cultural resources are sites, structures, buildings, districts, or objects, associated with important historic events or people, demonstrating design or construction associated with a historically significant movement, or with the potential to yield historic or prehistoric data, that

are considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason (NPS, 2008). Typically, historic and cultural resources are subdivided into the following categories:

- **Archaeological resources.** This includes prehistoric or historic sites where human activity has left physical evidence that activity but above ground structures remain standing
- **Architectural resources.** This includes buildings or other structures or groups of structures that are of historic or aesthetic significance.
- **Native resources.** These include resources of traditional, cultural, or religious significance to a Native American Tribe, Native Hawaiian, or Native Alaskan organization

There are multiple Federal regulations that protect historic and cultural resources. The National Historic Preservation Act of 1966 (NHPA) (P.L. 89-665, 16 U.S.C. §470) directs the Federal Government to consider the effects of its actions on historic and cultural resources under Section 106 through a four-step compliance process. It is noteworthy, however, that the law does not necessarily mandate preservation but does mandate a carefully considered decision making process. The four steps of the Section 106 compliance process are the following:

- **Establish whether the Proposed Action constitutes an undertaking.** Per 36 CFR 800.16, an undertaking is an action funded in whole or in part under the direct or indirect jurisdiction of a Federal agency. If the Proposed Action is an undertaking, the appropriate State Historic Preservation Office (SHPO) or Tribal Historic Preservation Office (THPO) and other consulting parties (stakeholders) are identified
- **Identify National Register-listed or eligible properties.** Eligible historic properties in the geographic area of the Proposed Action are identified and evaluated for significance, including properties potentially eligible or listed with the National Register of Historic Places (NRHP) that may be affected by the Proposed Action.
- **Assess affects of Proposed Action on eligible historic properties.** If the assessment determines no historic properties or no adverse effect to eligible historic properties, the SHPO/THPO and other consulting parties are informed, and the compliance process stops at this step. If the assessment determines actual or potential adverse effect to eligible historic properties, the SHPO/THPO and other consulting parties are notified through a letter and supporting documentation
- **Resolve adverse effects to eligible historic properties through consultation with the SHPO/THPO and Advisory Council on Historic Preservation (ACHP) as Necessary.**

### **Existing conditions**

The project is located in the City of Sidney, on an existing site next to a water tower. In preparation for this EA a letter was sent to the Nebraska State Historical Society requesting a review of this project. In a reply dated April 13<sup>th</sup> 2011 they state "A review of our files indicates that the referenced

project does not contain recorded historic resources” and that no survey for unrecorded cultural resources will be required. (Appendix A)

In preparation for this EA letters were sent to the Santee Sioux, Winnebago, Omaha, and Ponca Tribal Councils, requesting a review of this project. Follow-up phone calls were made to confirm that the letters were received. To date no responses have been received. (Appendix C)

## **Resource 7 –Aesthetic and Visual Resources**

Effects to aesthetic and visual resources deal broadly with the extent to which development contrasts with the existing environment, architecture, historic or cultural setting, or land use, and the determination of effects is a judgment that must be made by a qualified professional. Visual resources are the natural and man-made features that give an area its visual character. Visual resources generally refer to the urban environment, whereas aesthetic resources typically include impacts to natural and scenic areas.

Visual resources are inherently difficult to assess, because they involve subjectivity. Often communities, historical societies, and their corresponding jurisdictional agencies are the arbiters of visual effects resulting from the Proposed Action.

There are no Federal statutory or regulatory requirements for visual resources and aesthetics. State, regional, or local requirements may apply. If the landscape were cultural or historic, or part of a National Historic Landmark, the impacts would need to be reviewed under NHPA Section 106. Similarly, potential visual impacts on scenic byways would need to be assessed under the National Scenic Byways Program (P.L. 105-178, 23 U.S.C. §162) and laws concerning State-designated scenic byways. Consultation with the National Park Service may be required for potential impacts on the visual resources in State and national parks. Potential visual impacts for outdoor recreation sites and facilities covered by Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) (P.L. 88-578, 16 U.S.C. §460) may need to be reviewed.

### **Existing Conditions**

The project site is located in the City of Sidney at an existing water tower site. No unique view sheds related to national or state designated scenic byways, cultural or historic resources, or National Historic Landmarks were identified.

## **Resource 8 – Land Use**

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity that occur, or are permitted, on a parcel. There is no nationally recognized convention or uniform terminology for describing land use categories; definitions are typically promulgated at the local level in the form of zoning ordinances. As a result, the meanings of land use descriptions and definitions vary among jurisdictions.

Land use plans are usually established to ensure that development proceeds in an orderly fashion, encouraging compatible uses for adjacent land. There are many tools used in the

planning process, including master plans, geospatial databases, and zoning ordinances. A master plan is generally written by a county or municipality to provide a long-term strategy for growth and development. The foremost factor affecting land use is compliance and compatibility with master plans and zoning regulations. Other relevant factors include existing land use at project sites, the types of land uses on adjacent properties and their proximity to a Proposed Action, the duration of a proposed activity, and project permanence as a change in land use.

### **Existing Conditions**

The proposed Action is located on an existing parcel of land owned by the City of Sidney. This parcel of land is within the city limits of Sidney and is more commonly known as 590 Haskell Hill Rd. The current zoning classification as described on the official zoning map for the City of Sidney is Agricultural (A) District. A special Permit has been issued for the proposed action to construct the new communications tower.

#### Chapter 1246 – Special Permits

##### Section 1246.03 Conditions of Issuance

The Planning Commission may issue a special permit for the use of a lot, tract of land, building or structure in circumstances and in manner authorized by this Zoning Code, if the commission finds the propped use:

- a) Provides a service required by the neighborhood or community and is consistent with sound principles of land use;
- b) Will not be injurious to the use of neighboring lots, tracts of lands, buildings, or structures’
- c) Will not create special hazards or problems for the area in which it is located;
- d) Is related to and harmonious with the general plan of the area in which it is located, as indicated by this Zoning Code;
- e) Is otherwise in accordance with the intent and purposes of the Zoning Code. The commission may make the use which is authorized by special permit subject to reasonable conditions which, in the discretion of the Commission are necessary to carry out the intent and purposes of this Zoning Code.

### **Resource 9 – Infrastructure**

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure by definition includes a broad array of facilities (e.g., utility systems, streets, highways, railroads, airports, buildings and structures, and other manmade facilities). Individuals, businesses, governmental entities, and virtually all relationships between these groups depend upon this infrastructure for their most basic needs, as well as for critical and advanced needs (e.g., emergency response and health care).

Infrastructure is entirely man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “developed.” An essential

component of economic growth to an area is the availability of infrastructure and its capacity to support growth. The infrastructure components to be discussed in this section include utilities (electricity and communications), solid waste, and the transportation network.

Public utilities can be privately or publicly owned. Public utilities are often governed by a Public Utilities Commission that regulates the rates and services of a public utility. In recent years, several laws have been passed focusing on energy conservation and production. The Energy Policy Act of 2005 (P.L. 109- 58) provides tax incentives and loan guarantees for energy production of various types. The Energy Independence and Security Act of 2007 (P.L. 110-140) expanded the production of renewable fuels and contains provisions for energy efficiency, smart grid, and carbon dioxide and incentives for plug-in hybrid electric vehicles to assist the electric power industry's efforts to reduce greenhouse gas emissions.

Regulations governing communications infrastructure include Part 17 Construction, Marking, and Lighting of Antenna Structures of the FCC regulations (47 CFR Chapter 1), which prescribes procedures for antenna structure registration and requires the Federal Aviation Administration (FAA) to conduct an aeronautical study of the navigation air space to determine appropriate tower marking and lighting requirements to achieve safe air space. Before the FCC authorizes the construction of new antenna structures or alteration in the height of existing antenna structures, an FAA determination of "no hazard" may be required. FAA notification is required for any new construction greater than 200 feet above the ground, and near an airport runway (taller than 100:1 for a horizontal distance of 20,000 feet, 50:1 for a horizontal distance of 10,000 feet, and 25:1 for a horizontal distance of 5,000 feet of a heliport). By checking the heights of proposed antennae and their proximity to airports, the FCC's TOWAIR software system assists in determining if FAA notification is required. The FAA can vary marking and lighting recommendations when requested, provided that aviation safety is not compromised. In all cases, safe aviation conditions around the tower are the FCC's primary concern, and safety concerns dictate the marking and lighting requirements. Navigation air space, which starts at 200 feet above the ground, decreases in elevation in close proximity to airports; the minimum height for required marking or lighting would decrease in these areas.

### **Existing Conditions**

The Proposed Action area has a combination of utilities along with few, yet adequate transportation network of roads available in the area. Access to the site can be obtained by use of Haskell Hill Road. No airports are located within 5 miles of the Proposed Action.

### **Resource 10 – Socioeconomic Resources**

Socioeconomics comprise the basic attributes and resources associated with the human environment, including demographic, economic, and social assets of a community. Demographics focus on population trends and age. Economic metrics provide information on employment trends and industries. Housing, infrastructure, and services are also influenced by socioeconomic factors.

EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations) directs agencies to address environmental and human health conditions in minority and

low-income communities. Environmental justice addresses the disproportionate and adverse effects of a Federal action on low-income or minority populations. The intent of EO 12898 and related directives and regulations is to ensure that low-income and minority populations do not bear a disproportionate burden of negative effects resulting from Federal actions. The general purposes of EO 12898 are the following:

- To focus the attention of Federal agencies on human health and environmental conditions in minority communities and low-income communities, with the goal of achieving environmental justice.
- To foster nondiscrimination in Federal programs that substantially affects human health or the environment
- To give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment

### **Existing Conditions**

With regard to socioeconomic conditions of the proposed site, the proposed action does not benefit one race or economic class over any other. The upgrade in the communications system would benefit all populations by improving communication related to public safety.

### **Resource 11 – Human Health and Safety**

A safe environment is one in which there is no danger (or an optimally reduced, potential) for death, serious bodily injury or illness, or property damage. Human health and safety addresses workers' health and safety, and public safety during demolition and construction activities and during subsequent operations of those facilities. Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous regulations designed to comply with standards issued by Occupational Safety and Health Administration (OSHA), EPA, and State agencies. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

### **Existing Conditions**

The Proposed Action would require construction activities on a portion of a graveled parcel located in rural mountainous rangeland. Construction and ground-disturbing activities would take place for approximately one week and would include slight grading and digging with the use of a dozer, using a pier drill rig for the base and footings, and the use of a mobile crane for erecting the tower

## SECTION 4 – ENVIRONMENTAL CONSEQUENCES

### Resource 1 – Noise

Noise analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a Proposed Action.

#### Proposed Action

**Construction-Related Impacts** – Because of construction-related activities, there would be a temporary increase in localized noise generated during the City of Sidney Tower construction activities. Construction activities for new infrastructure may result in short-term, negligible adverse impacts. Noise from the construction activities will vary depending on the distance from the source of the noise. The noise levels generated by construction equipment would vary substantially depending on the type of equipment used, operations schedule, and condition of the project area. In addition to daily variations in construction activities, major construction for new infrastructure would be accomplished in several different stages, with each stage having a specific equipment mix for the work to be accomplished. The use of heavy equipment during construction activities may result in short-term minor adverse impacts on the noise environment, especially if noise-sensitive populations are adjacent to a proposed site. Typically, construction-related noise generation would last only for the duration of construction activities and occur during normal working hours (i.e., 7:00 a.m. to 5:00 p.m.), when noise is tolerated better because of the masking effect of background noise, with equipment being shut off when not in use. Evening noise levels would likely drop to ambient noise levels of the project area.

Therefore, it is anticipated that noise impacts from the Proposed Action construction activities would be temporary and would not exceed typical noise levels. Noise levels dBA at 50 feet from the source would be no greater than 85 dBA for no more than four to six continuous hours per day over a 10 to 35 day period. Construction-related noise impacts from the City of Sidney Tower Project would not be significant.

**Operations-Related Impacts** – After construction has concluded, the ambient noise level would return to its normal level. Temporary noise could be generated by climate control such as heating and air conditioning equipment or backup generators at the project site. Backup generators included in the Proposed Action provide electric power to communications equipment as needed. Electric generators at transmitting and receiving sites are typically powered by either diesel or spark ignition such as propane or natural gas engines. Noise from backup generators is primarily composed of engine noise and exhaust noise.

Because of the occasional and intermittent operation of the backup generator, the Proposed Action is not anticipated to cause adverse long-term impacts or measurably increase the ambient noise levels. Impacts to ambient noise levels resulting from the Proposed Action would not exceed typical operating noise levels and would be short-term. Therefore, there would be no significant long-term noise impacts.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. No adverse impacts on the ambient noise environment would occur under the No Action Alternative.

### **Resource 2 – Air Quality**

Impacts to air quality can come from a variety of sources located at transmitting and receiving sites. During construction, sources of new emissions include construction vehicles and equipment and fugitive dust emissions resulting from ground-disturbing activities and demolition.

Operations-related impacts to air quality from transmitting and receiving sites would occur as a result of the operation of backup generators, which burn fossil fuels.

### **Proposed Action**

**Construction Related Impacts** – Air quality impacts during construction would originate from emission of construction vehicles, equipment, and fugitive dust stirred up during ground disturbing activities. Both would be temporary and of limited duration. Air quality impacts from construction activities vary depending on the construction activity, where the construction would occur, and the distance from the source of the emission.

The use of heavy equipment during construction activities may result in short-term minor adverse impacts on air quality on and near the proposed site. Typically, construction-related air quality impacts would last only for the duration of construction activities and occur during normal working hours (i.e., 7:00 a.m. to 5:00 p.m.), and would not result in increases in criteria air pollutants greater than expected levels. Construction activities at the City of Sidney tower site would be for no more than four to six continuous hours per day and will take place during an approximately one week time frame. Therefore, it is anticipated that short-term negligible adverse impacts would be expected as a result of construction activities. There would be no significant impact to air quality from construction activities from the Proposed Action.

The minor emissions from construction can be further reduced or mitigated through the use of best management practices (BMP). BMPs for dust control include spraying water to minimize dust, limiting the area of uncovered soil to the minimum needed for each activity, siting of staging areas to minimize fugitive dust, using a soil stabilizer (chemical dust suppressor), mulching, using a temporary gravel cover, limiting the number and speed of vehicles on the site, and covering trucks hauling dirt. BMPs for construction vehicle and equipment emissions include limiting vehicle idling time, using low or ultra-low sulfur fuel (including biodiesel), conducting proper vehicle maintenance, and using electric- instead of gas-powered tools. The City of Sidney Tower site will utilize these BMPs during construction activities and will also use locally available products and materials to reduce transportation-related emissions.

In addition the City of Sidney Tower will require less than 0.25 acres ground disturbance which is unlikely to result in any exceedance of air quality standards, regulated release of Hazardous Air

Pollutants (HAP), or in more than a de minimis increase in emissions. The Proposed Action would have no significant impact to air quality from construction related activities.

**Operations-Related Impacts** – After the construction activities have concluded, the ambient air quality level would return to its normal level. Implementation of this Proposed Action would not result in the long-term operation of significant emission-generating sources, nor would it significantly increase or alter the existing levels of ambient air quality levels.

### **No Action Alternative**

Under the No Action Alternative, there would be no construction. There would be no increase in air quality impacts from the No Action Alternative.

## **Resource 3 – Geology and Soils**

Impacts to geology and soils may result from ground disturbing activities, such as excavation grading, backfilling, trenching, and other activities.

### **Proposed Action**

**Constructing-Related Impacts** – Soil erosion and runoff may occur from the City of Sidney Tower construction site as a result of ground-disturbing activities, such as slight grading, and digging with the use of a dozer, using a pier drill rig for the base and footings, and the use of a mobile crane for erecting the tower. The ground-disturbing activities will take place for approximately one week.

Based on a review of the USDA Natural Resources Conservation Service Web Soil Survey, the soil types at the project site are not defined as prime or unique. Ground disturbing activities for the Proposed Action are not located on a unique geologic formation. There would be no significant impact to geology or soil from construction-related activities such as grading and digging with the use of a dozer, using a pier drill rig for the base and footings, and the use of a mobile crane for erecting the tower

**Operations-Related Impacts** – The operation of the City of Sidney Tower site would not involve any ground-disturbing activities or other activities that would affect geology and soils. There would be no impacts to geology and soils including prime and unique farmlands.

### **No Action Alternative**

Under the No Action Alternative, there would be no ground disturbing activities nor there any new construction. There would be no impact to geology and soils as a result of the No Action Alternative.

## **Resource 4 – Water Resources**

Impacts to water resources can result from several types of activities and procedures that would be in use at transmitting and receiving sites. Impacts would typically result from erosion caused by site runoff, direct contamination by chemicals used in the surrounding area that would be

washed into a water body or absorbed into the water table, and building directly in or adjacent to a water resource such as a wetland. The use of erosion-control BMPs to reduce impacts is common practice and may improve water quality at a site. Development in floodplains poses a hazard both to human safety from flood events and to natural resources from the disruption of natural hydrologic patterns.

## **Proposed Action**

### **Surface Water and Groundwater**

**Construction-Related Impacts** – Potential water quality impacts from construction may result from erosion and runoff resulting from soil disturbance for material storage, site access, site preparation, or road and driveway construction. Vehicle and equipment washing could also increase sediment reaching nearby streams. Pesticides or herbicides used to stimulate revegetation of areas cleared during construction also have the potential to contaminate nearby waters. All these activities would be temporary and of limited scope.

Water quality impacts from construction activities would vary depending on the construction equipment used, soils where the construction would occur, and the distance between the project site and the receiving waters. Considering that there are no nearby water resources from the proposed site and the relatively limited size of the City of Sidney Tower footprint of less than 0.25 acres ground disturbance, construction activities are unlikely to result in a significant amount of erosion.

The minor erosion and runoff from the City of Sidney Tower construction can be further reduced or mitigated through the use of BMPs. BMPs for erosion control include silt fencing or straw bales to control erosion, limiting the area of uncovered soil to the minimum needed for each activity, siting of staging areas to minimize erosion, and limiting the number and speed of vehicles on the site.

Chemical, physical, or biological effects to water resources are not expected to result in the violation of water quality standards and criteria as none are located in the area. There would be no significant impact to water quality from construction activities of the City of Sidney Tower site.

**Operations-Related Impacts**-Operations-related impacts would be limited to the time during refueling of the backup generator occurs. A spill plan will be developed and followed to guide the required response in the event of a spill. Chemical, physical, or biological effects to water resources are not expected to result in the violation of water quality standards and criteria as none are present in the area. There would be no significant impact to water quality from operations activities.

### **Floodplains**

According to the Flood Insurance Rate Map (FIRM) on-line database the site is not in a floodplain.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. There would be no risk of soil erosion or runoff from construction-related activities, nor would there be, a risk of hazardous spills or other consequences from operations-related impacts limited to the time during refueling of the backup generator. Therefore, there would be no impacts to either water resources or floodplains from the No Action Alternative.

### **Resource 5 – Biological Resources**

Impacts to biological resources can result from several activities, including construction activities such as demolition, grading, excavation, and construction that could alter or destroy habitat, either temporarily or permanently. In addition, the continued presence of human activity on a smaller scale could result in behavioral impacts to certain animal species that could affect feeding and reproductive patterns and habits.

### **Proposed Action**

#### **Wildlife, Wildlife Habitat, and Vegetation**

**Construction-Related Impacts** – Short and long-term minor to moderate adverse impacts on wildlife, habitats, and vegetation would not be expected as a result of construction-related activities for the City of Sidney Tower under the Proposed Action. Since the City of Sidney Tower site is situated on an existing graveled area in town, it would be expected to have no potential for adverse impacts on native vegetation.

Construction-related activities will not have an impact on wildlife, habitat, and vegetation at the City of Sidney Tower project site due to its location on an existing graveled area. There would be no significance of vegetation loss associated with the City of Sidney Tower project due to the fact that the site is located on 0.25 acres of an existing graveled area. Database searches were made for wildlife, wildlife habitat, and vegetation in the proposed City of Sidney Tower project construction site. Consultation with the US Fish and Wildlife Service was submitted on March 11, 2011. A response stating no anticipated significant impacts was received April 11<sup>th</sup>, 2011.

**Operations-Related Impacts** – Operations-Related activities at the City of Sidney Tower site will not have an effect to listed or proposed protected species or critical habitats as none are present due to the fact that the site will be located on an existing graveled area.

#### **Threatened and Endangered Species**

**Construction-Related Impacts** - Since no threatened, endangered, and sensitive species habitat were observed at the Proposed Action project site or on the surrounding area, construction-related impacts would be expected to have no impact on threatened, endangered, and sensitive species habitats.

**Operations-Related Impacts** – Following the completion of site development, operations-related impacts from the City of Sidney Tower is not expected to occur. Overall, operations-related impacts would be expected to have no effect on threatened and endangered species.

### **Wetlands**

**Construction-Related Impacts** – Since no wetland habitat was observed at the Proposed Action project site or surrounding area constructed-related impacts would be expected to have no impact on wetland habitats.

**Operations-Related Impacts** – The City of Sidney Tower site an existing graveled area. Since no wetland habitat was observed at the project site, operations-related impacts would be expected to have no impact on wetland habitats.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. No significant impacts on vegetation and wildlife, migratory birds, threatened and endangered species, or wetlands would occur under the No Action Alternative.

## **Resource 6 – Historic and Cultural Resources**

Impacts to historic and cultural resources can occur both from physical disturbance of historic properties and from aesthetic changes to a historic property or its view shed. To determine the nature of impacts to historic properties, as defined under the NHPA, consultation with the relevant State SHPO, or THPO, are required.

### **Proposed Action**

**Construction-Related Impacts** – Construction-related impacts to historic and cultural resources at and near the City of Sidney Tower site were assessed to determine if temporary impacts to view sheds and present risk of permanent impact or harm to historic properties, primarily through ground-disturbing activities. Consultation with the Nebraska State Historic Society was conducted to determine whether the construction of the City of Sidney Tower and installation associated antennae, microwave links, and infrastructure may generate any short-term or long-term indirect impacts to historic and cultural resources and within the view shed of any historic and cultural resources. In a letter dated April 13<sup>th</sup> 2011 states there are no recorded known historic resources in the area.

**Operations-Related Impacts** – Operation of the City of Sidney Tower would not typically require any ground-disturbing activities; therefore, it is expected that there would be no impact to archaeological resources. Based on correspondence with the SHPO/THPO, no adverse impacts would occur.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. Therefore, there would be no impact to historic and cultural resources resulting from the No Action Alternative.

## **Resource 7 – Aesthetic and Visual Resources**

Potential impacts of aesthetic and visual resources are likely to be greater in more natural (rural) settings than commercial or residential settings (urban and suburban) where development is more common. Impacts on aesthetic and visual resources may be short- or long-term, depending on whether the impact is related to construction activities or the feature that is being constructed.

### **Proposed Action**

**Construction-Related Impacts-** Under the Proposed Action, impacts on aesthetics and visual resources from construction-related activities would include the construction of infrastructure necessary to operate the transmitting and receiving site, and the construction of the specific sites' facilities on the existing graveled area. The degree of visual disturbance depends on the project-specific construction activities, and each viewer's perception. Short-term impacts on aesthetic and visual resources resulting from construction-related activities would likely have no significant impact.

**Operations-Related Impacts –** Features that might create a permanent contrast with the existing environment would include the 300-foot guyed tower and building associated with the City of Sidney Tower site. The long-term impacts resulting from the permanent placement of the City of Sidney Tower site would likely have no significant impact.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. There would be no impact to aesthetic or visual resources resulting from the No Action Alternative.

## **Resource 8 – Land Use**

Impacts to land use can occur when incompatible land uses are placed adjacent to one another. PSIC-funded transmitting and receiving projects would not be compatible with all land use types and should be carefully sited, in accordance with local master plans, planning initiatives, local zoning, and coastal land use restrictions. Transmitting and receiving sites are most compatible with industrial, commercial, or public and quasi-public land uses, such as utilities, because of the basic intended function of these sites and the associated activities by which their operation is characterized. Compatibility with land use planning is derived from the function or purpose such as operation of the site; construction activities do not have any substantive bearing on impacts to land use planning. Therefore, only impacts from operations will be discussed in this section.

### **Proposed Action**

General Land Use Compatibility for the City of Sidney Tower site would not be compatible with all types of land uses. In general it is expected that siting of Proposed Action would be compatible with existing land use plans and zoning at and adjacent to the proposed site and would not impose an incompatible land use on an area. Commercial, industrial, and some public and quasi-public facilities, such as airports and utilities, would be compatible, because

infrastructure and activities are similar to those associated with transmitting and receiving sites. The City of Sidney Tower site is located on an existing graveled area in town.

The Proposed Action is located on an existing graveled area in town and is not located in a coastal zone or coastal barrier resources. No local zoning rules prohibit the Proposed Action. Therefore No significant impact would occur related to general land use compatibility with the City of Sidney Tower Site.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. Therefore, there would be no impacts to general land use compatibility, coastal zone, or coastal barrier resources resulting from the No Action Alternative.

### **Resource 9 – Infrastructure**

Impacts to infrastructure are typically observed as disruptions in service and utilities, either short- or long-term, resulting from increases in demand that may overwhelm the capacity of the local area to absorb them. Engagement in a planning process to ensure that system capacity will be able to meet projected increases in demand is the most effective way to avoid impacts to infrastructure, although resources may not always be available to implement upgrades.

### **Proposed Action**

#### **Utilities**

**Construction-Related Impacts-** The City of Sidney Tower project is located on an existing graveled area in town. Construction-related activities would require additional short-term electric and communication services from available utility networks. The Proposed Action will utilize the existing electrical power lines located approximately 300 feet east of the site. Construction-related impacts are not expected to lead to major shortages in supply, nor are they expected to require major changes to the system. Impacts to utilities would not be significant.

During construction related activities, precautions would be taken to avoid damage to existing utility lines. All potential modifications to utility services would be evaluated. Coordination with potentially affected local and regional utility service providers would occur to avoid unnecessary damage or interruption of service. There would be no significant impact to utility services from construction-related activities with the City of Sidney Tower Site.

**Operations-Related Impacts –** The Proposed Action would not be expected to cause noticeable impacts to local utility services across all category types. Operations impacts are not expected to lead to major shortages in supply, nor are they expected to require major changes to the services. There would be no significant impact to utility services from operations-related activities of the City of Sidney Tower site.

## **Transportation-Network**

**Construction-Related Impacts** – For the City of Sidney Tower site construction related activities, heavy equipment and materials that may be needed for site access and site preparation would not pose a significant impact to the transportation network. Construction of the Proposed Action may require numerous truck trips to haul materials to the project site. The number of construction-related trips and the frequency and duration of impacts would be dependent on the location, nature, and scale of the project. Since the City of Sidney Tower site is a 300-foot guyed tower, the surface impact less than 0.25 acres in size of an existing graveled area; a significant amount of construction related traffic is not required to complete the project.

Potential impacts to transportation are expected to be low, provided appropriate planning and implementation actions are taken. Existing roads would be used to the maximum extent possible. There would be no significant impact to transportation networks from construction related activities.

**Operations-Related Impacts** – Due to a limited footprint of the City of Sidney Tower site, less than 0.25 acres, approximately one trip per month by light-duty vehicles and/or personal vehicles will be required. Transportation activities during operations would not be expected to cause noticeable impacts to local transportation networks. There would be no significant impact to transportation networks from operations-related activities.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. There would be no impact to utilities or the transportation network resulting from the No Action Alternative.

## **Resource 10 – Socioeconomic Resources**

Impacts to socioeconomic resources are assessed in terms of the effects of expenditures on the overall local economy and the impact of in-migration on demographics, employment, the availability of housing, and the ability of a jurisdiction to provide services such as education and public safety. In addition, disproportionate impacts to low-income or minority populations would result in adverse environmental justice impacts.

### **Proposed Action**

The implementation of the PSIC-Funded project may result in increase in jobs as a result of the construction of the City of Sidney Tower site, but the increase is not expected to be significant.

Although increase in employment would be expected as a result of the implementation of PSIC funded project, increases are not expected to be significant. There would, therefore, be no expected in-migration and therefore no impacts expected to demographics, the supply of housing, or other local entities to provide public services.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. Under this alternative, there would be no increase in economic activity and job creation related to implementation of the project. Therefore, there would be no PSIC-related impacts to demographics, the availability of housing, the availability of services, or environmental justice.

## **Resource 11 – Human Health and Safety**

Impacts to human health and safety can come from a wide range of activities. Workplace and construction site safety can adversely impact health and safety, as well as the generation, handling, storage, use, or disposal of hazardous or toxic materials.

### **Proposed Action**

**Construction-Related Impacts** – Under the proposed Action, there would be a slight increase in workplace safety hazards during the construction phase of the City of Sidney Tower site because of the nature of construction work and the increased intensity of work at the proposed site. The impact of this increase would not be significant. Work areas surrounding construction activities would be fenced, and appropriate signs would be posted to further minimize safety risks. In addition, implementation of worker safety rules, derived from OSHA safety and health standards, will establish a uniform set of safety practices and procedures to protect workers. Construction-related impacts to human health and safety impacts would not be significant.

**Operations-Related Impacts** – The City of Sidney Tower site would be fenced, and access would be restricted to authorized personnel to minimize risks to human health and safety. There would be no significant adverse impacts to human health and safety resulting from operation of the City of Sidney Tower site under the Proposed Action.

The implementation of Proposed Action would enable public safety agencies to improve interoperable communications and communicate more effectively in an emergency or crisis situation. This would result in an operations-related beneficial impact to human health and safety.

### **No Action Alternative**

Under the No Action Alternative, there would be no new construction. Current interoperability interruption would continue, compromising the ability of first responders to respond effectively and rapidly to emergency situations. There could be adverse impacts to human health and safety as a result of the No Action Alternative.

## **SECTION 5 – FINDING AND CONCLUSIONS**

### **Findings**

The Proposed Action will require construction of a new transmitting and receiving site involving a guyed telecommunications tower over 300 feet and ground-disturbance totaling less than 0.25 acres of slight grading of an existing graveled area.

The Proposed Action will not involve any unusual risks or impacts to sensitive areas identified in Section 4. The No Action Alternative could result in adverse impacts to human health and safety. Therefore, the Proposed Action would warrant the issuance of a FONSI for this Proposed Action.

In accordance with 47 CFR Section 1.1307 (a) (1) through (8), an evaluation has been made to determine whether any of the listed FCC special interest items would be significantly affected if a tower structure and/or antenna and associated equipment control cabinets were constructed at the proposed site location. No FCC special interest items were identified.

### **Consequences of the Proposed Action**

The Proposed Action would not have a significant impact on any resource area for those projects falling within the 11 resource parameters described in the EA. The Proposed Action would have beneficial impact on human health and safety, because it would enable countywide improvements to public safety interoperable communications.

### **Consequences of the No Action Alternative**

Under the No Action Alternative, no interoperable communications capability would occur. Existing interruption in public safety interoperable communications would persist, resulting in an adverse impact to human health and safety.

## **LIST OF PREPARERS**

Jesse Scherer, Technician, Action Communications

## **Figures**

Figure 1: USGS Sidney Digital Map Beta

Figure 2: FEMA Firm

Figure 3-9: Site Photos

Figure 1: USGS Sidney Digital Map Beta

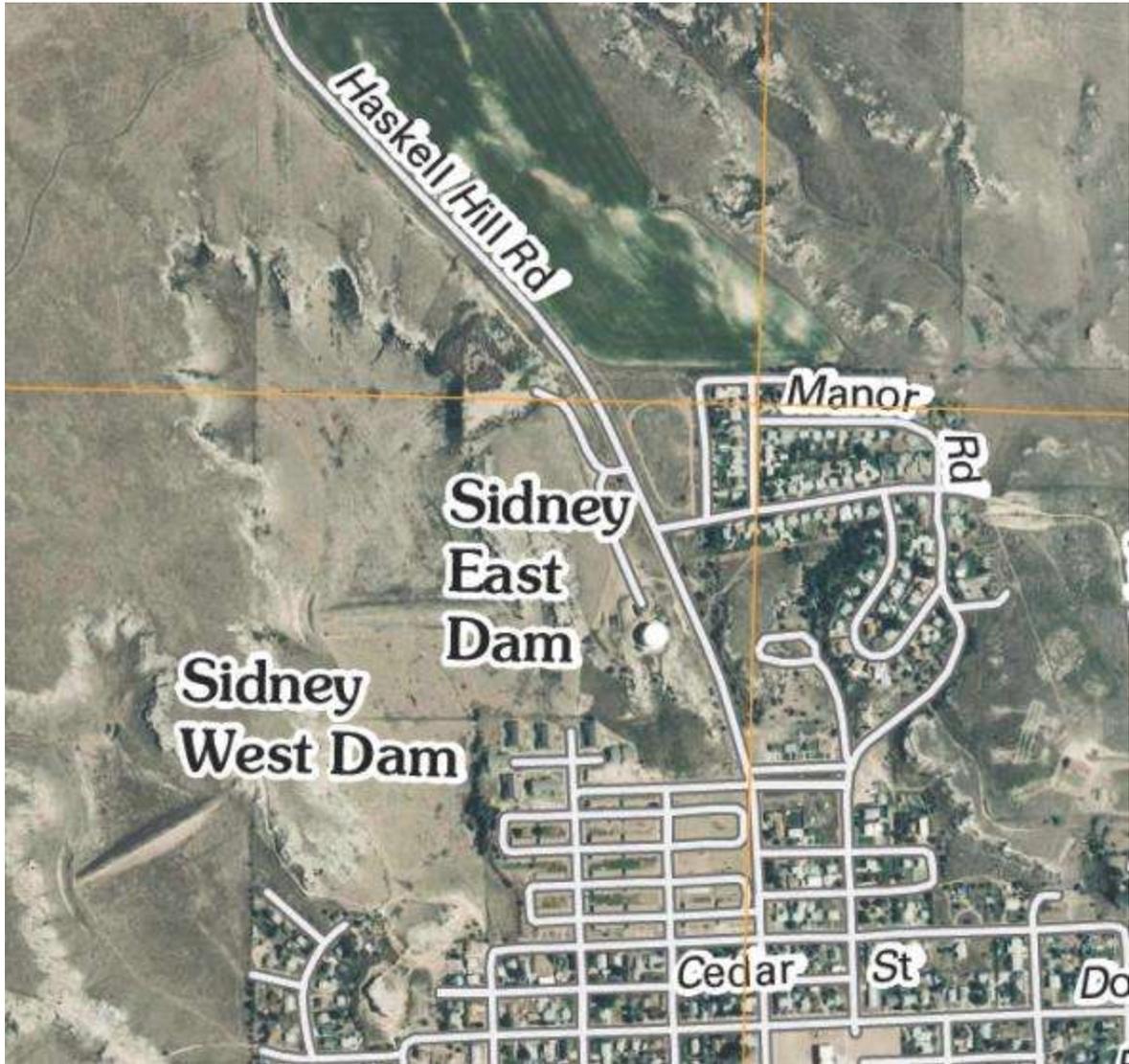


Figure 2: FEMA Firm

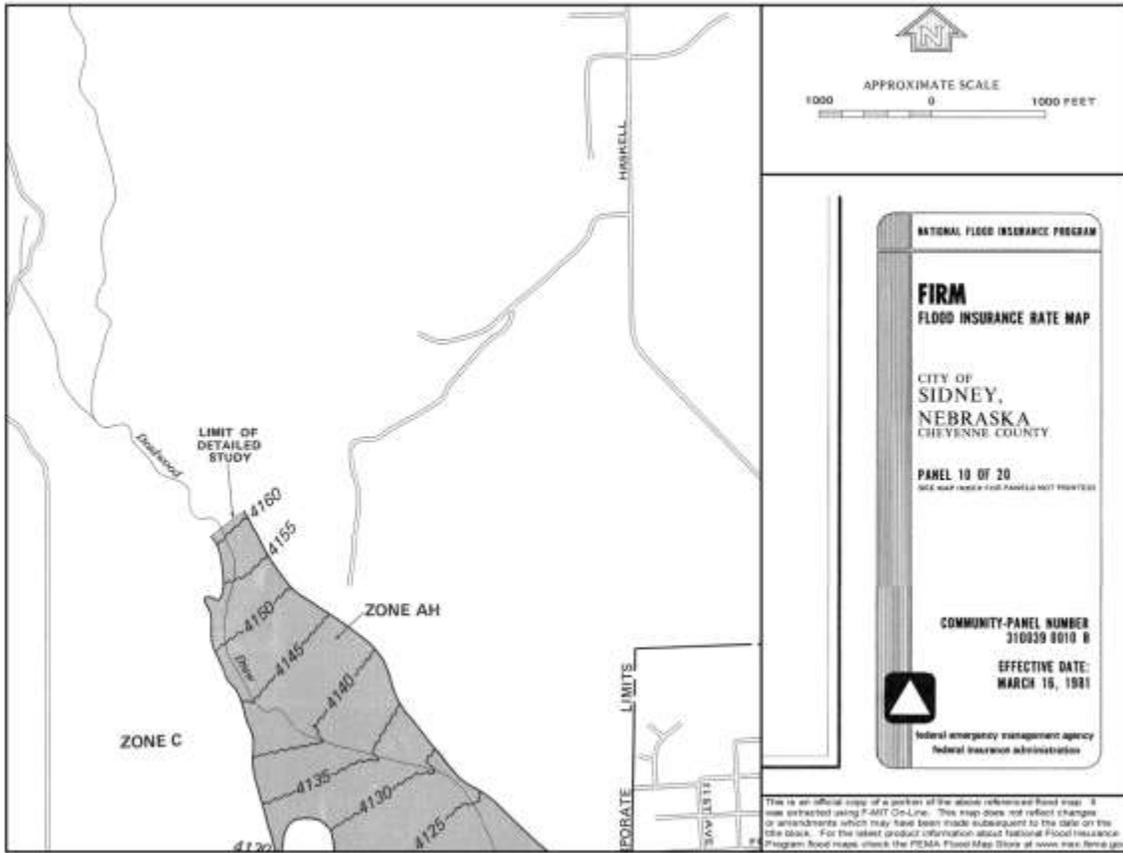


Figure 3: Site Photo



Figure 4: Site Photo



Figure 5: Site Photo



Figure 6: Site Photo



Figure 7: Site Photo



Figure 8: Site Photo



Figure 9: Site Photo



**Appendix A: Response Letters**

**Appendix B: Soil Survey**

**Appendix C: Tribal Letters**

**Jesse Scherer**

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**From:** Vanek, Wayne - Lincoln, NE [Wayne.Vanek@ne.usda.gov]  
**Sent:** Monday, March 14, 2011 1:23 PM  
**To:** Jesse Scherer  
**Subject:** City of Sidney Tower Project



**ATTENTION: Jesse Scherer - Internet Support Technician**

I am responsible for the Farmland Protection Policy Act (FPPA) concerns and have reviewed the information you sent regarding the project for which you requested review of impacts. This review only covers FPPA concerns and does not include any other environmental concerns such as wetlands or endangered species. For general conservation concerns or questions relating to wetlands under the jurisdiction of the Food Security Act, contact your local county Natural Resources Conservation Service office.

It has been determined that a Farmland Conversion Impact Rating form (AD-1006) will not be needed on this project since the project is within the city limits and no additional cropland will be taken out of production, thus, **NRCS has determined that your project was found to be cleared of FPPA significant concerns.** We encourage you to continue to be aware of prime and important farmlands in general and the role they play in current and future projects.

Wayne Vanek  
USDA-NRCS  
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## Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370

Phone: 402-471-0641 / Fax: 402-471-5528 / [www.OutdoorNebraska.org](http://www.OutdoorNebraska.org)

April 6, 2011

Jesse Scherer  
Action Communications  
315 West 27<sup>th</sup> Street  
Scottsbluff, NE 69361

**RE: Construction of a 300-foot guyed communications tower on the north side of the City of Sidney, Cheyenne County, Lat 41.1533 Long -102.9881**

Dear Mr. Scherer:

Nebraska Game and Parks Commission (NGPC) staff members have reviewed the information for the proposal identified above. This review was requested pursuant to the National Environmental Policy Act (NEPA).

Based on our review of the Nebraska Natural Heritage database, aerial photographs, and site photographs, we have determined that the project as described is not likely to adversely affect state-listed threatened or endangered species. The proposed project will not impact any NGPC State Park, State Recreation, or State Wildlife Management Areas, as none are located in the immediate project area.

We have grown increasingly concerned about the recent increase in tower construction across Nebraska and impacts that this might have on populations of migratory birds. Siting of new towers does have the potential to adversely impact migratory birds depending on the tower height, presence of guy wires, and lighting. The U.S. Fish and Wildlife Service has adopted several guidelines to eliminate or minimize a tower's potential to cause unnecessary bird mortality. We support these guidelines, which are summarized below. New communications equipment should be collocated on existing towers or other structures, when feasible. If a new tower must be constructed, it is encouraged to be located within an existing cluster of towers, and located to avoid wetlands, riparian areas, known bird concentration areas, and migration corridors. These towers should be no more than 199 feet above ground level using construction techniques that do not require guy wires. If the Federal Aviation Administration (FAA) requires aviation safety lights, flashing white strobe lights should be used at night, with at least a 3-4 second dark phase between flashes, instead of a solid red or pulsating beacon. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied. Any security lighting for on-ground facilities and equipment should be down shielded to keep the light within the boundaries of the site.

The proposed tower does not comply with the above-mentioned guidelines, as it is proposed as a 300-foot guyed structure. If the tower is constructed as proposed, and if lighting is required on the tower, we encourage compliance with the lighting guidelines mentioned above.

Thank you for the opportunity to review this proposal. If you have any questions regarding these comments, please contact me at (402) 471-5423.

Sincerely,

A handwritten signature in black ink that reads "Carey Grell". The signature is written in a cursive style with a large initial 'C' and a distinct 'G'.

Carey Grell  
Environmental Analyst  
Realty and Environmental Services Division



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Nebraska Field Office  
203 West Second Street  
Grand Island, Nebraska 68801

April 11, 2011

**FWS-NE: 2011-312**

Jesse Scherer  
Actions Communications, Inc.  
315 W. 27<sup>th</sup> Street  
Scottsbluff, NE 69361

**RE: Action Communications, 300 ft-Guyed, Communication Tower, Cheyenne County, Nebraska.**

Dear Mr. Scherer:

This responds to your March 11, 2011, request for comments from the U.S. Fish and Wildlife Service (Service) regarding the subject project. The Service has responsibility for conservation and management of fish and wildlife resources for the benefit of the American public under the following authorities: 1) Endangered Species Act of 1973 (ESA), 2) Fish and Wildlife Coordination Act (FWCA), 3) Bald and Golden Eagle Protection Act (Eagle Act), and 4) Migratory Bird Treaty Act (MBTA). The National Environmental Policy Act (NEPA) requires compliance with all of these statutes and regulations. The project proponent and lead federal agency (i.e., the Federal Communications Commission, FCC) is responsible for compliance with these federal laws.

The Service has special concerns for endangered and threatened species, migratory birds, and other fish and wildlife and their habitats. Habitats frequently used by fish and wildlife species are wetlands, streams, riparian (streamside) woodlands, and grasslands. Special attention is given to proposed developments that include modification of wetlands, stream alteration, loss of riparian habitat, or contamination of habitats. When this occurs, the Service recommends ways to avoid, minimize, or compensate for adverse affects to fish and wildlife and their habitats.

### **ENDANGERED SPECIES ACT**

Pursuant to section 7(a)(2) of the ESA, every federal agency, shall in consultation with the Service, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. If a proposed project may affect federally listed species or designated critical habitat Section 7 consultation is required.

Based on the information you have provided and due to the project type, size, and location, we do not anticipate any impacts to federally listed species, or their critical habitats. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

All federally listed species under ESA are also State-listed under the Nebraska Nongame and Endangered Species Conservation Act. However, there are also State-listed species that are not federally listed. It appears that the proposed project lies within the range of the state listed swift fox and mountain plover. To determine if the proposed project may affect these State-listed species, the Service recommends that the project proponent contact Michelle Koch, Nebraska Game and Parks Commission, 2200 N. 33<sup>rd</sup> Street, Lincoln, NE 68503-0370.

### **BALD AND GOLDEN EAGLE PROTECTION ACT (Eagle Act)**

The Eagle Act provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) by prohibition, except under certain specific conditions, the taking, possession, and commercial use of such birds. The golden eagle is found in arid, open country in western Nebraska and usually near buttes or canyons which serve as nesting sites. Golden eagles forage in open rangeland and prairie dog colonies to prey on prairie dogs and other mammals. Golden eagles will defend a breeding/foraging territory, typically ranging from 20-50 square miles, depending on the breeding pair. Upon review of our database, golden eagles have been confirmed nesting within 15 miles of the proposed project.

### **MIGRATORY BIRD TREATY ACT (MBTA)**

The MBTA prohibits the killing (“take”) of migratory birds. Communication towers are currently conservatively estimated to kill between 4-50 million birds per year, clearly a violation of the spirit and intent of the MBTA. Some listed species protected under the ESA and the Bald and Golden Eagle Protection Act are also killed, further elevating Service concerns. The problem is especially acute at tall, lighted, guyed towers, (such as the proposed radio tower), particularly during inclement weather at night during spring and fall migration periods.

The placement of communication towers (including radio, television, cellular, and microwave) in the United States has been growing at an exponential rate, especially in the past several years. According to the *FCC 2006 Antenna Structure Registry*, approximately 104,703 antenna structures were registered with the Commission as of November 2, 2006. The siting of new towers, increasing at an estimated 6-8 percent annually, creates a potentially significant impact on migratory birds, especially for some 350 species of night-migrating neotropical songbirds. Guy wire strikes by such species as large wading birds, cranes, waterfowl, and raptors may also occur during the daytime when towers separate feeding, nesting, and roosting areas. As noted in your letter, the proposed 300-foot, guyed tower occurs in an area where there are documents breeding records for several migratory bird species of concern, including swainson’s hawk and burrowing owls. Due to the tower height, guy wires and the location of the project the Service is concerned that take (mortality)

height, guy wires and the location of the project the Service is concerned that take (mortality) of migratory birds, prohibited under the MBTA, has the potential to occur as the result of the proposed project.

There is also potential for the proposed project to result in take of nesting migratory birds at the project site. Construction of the tower, access road or equipment building affecting this grassland habitat may result in take of nesting birds if construction occurs within the nesting season. In Nebraska, most migratory bird nesting activity in Nebraska occurs during the period of April 1 to July 15, and the Service recommends that construction activities be scheduled to avoid this primary nesting period.

### **Recommendations Regarding MBTA**

In order to reduce the likelihood of prohibited take of migratory birds from collision with the guy wires of the proposed project, the Service recommends that the following measures be incorporated into the proposed cell tower near Sidney, Nebraska.

1. Co-locate with an existing nearby tower if one exists. If co-location is not an available alternative, then implement the following conservation measures.
2. Construct a tower that is less than 199 feet above ground level (AGL), keeping it unguyed with no supporting wires (e.g., lattice structure). If it is impossible to build a self-supporting tower of adequate height to meet project objectives, then all guy wires should be marked with bird deflectors to reduce the potential for bird collisions. These bird deflectors should be maintained in working order for the life of the project.
3. The tower should be unlighted if FCC regulations permit. Current research indicates that constant or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Therefore, it is recommended that flashing white strobes be installed as aircraft warning beacons with at least a 3-4 second dark phase between flashes, instead of a solid red or pulsating beacon. Red strobe lights have not yet been studied.
4. A self-supported, unguyed tower should be constructed no closer than 1-mile away from wetlands, wet meadows, or riverine habitats.
5. In order to reduce the number of towers needed in the future, the new tower should be designed structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (i.e., a minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.
6. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.
7. If the proposed tower is constructed, it is requested that Service and Nebraska Game and Parks Commission personnel and/or their contractors be allowed to conduct dead-

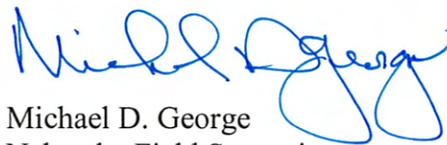
bird searches on a regular or irregular basis, especially following nights of fog, mist, or low ceilings. Such agency personnel and/or their contractors should also be permitted to use and place radar, GPS, infrared, thermal imagery, and acoustical monitoring equipment at the tower site to assess and verify bird migrations and habitat use.

8. Within 1-month of construction being completed, provide this office and FCC with post-construction photographs and a signed statement that the above conservation measures were implemented for avoiding impacts to migratory birds.
9. Provisions are incorporated into the proposed plans and funding is secured to remove the proposed tower and building and restore the site after the tower is no longer in use or abandoned.

Further, while the MBTA has no provision for allowing an unauthorized take, it must be recognized that some birds may be killed at structures such as communication towers even if all reasonable measures to avoid it are implemented. The Service's Division of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. While it is not possible under the MBTA to absolve individuals or companies from liability if they follow these recommended guidelines, the Division of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds.

The Service appreciates the opportunity to review and comment on the subject project. Should you have questions regarding these comments, please contact Ms. Jeanine Lackey within our office at [jeanine\\_lackey@fws.gov](mailto:jeanine_lackey@fws.gov) or (308)382-6468, extension 14.

Sincerely,



Michael D. George  
Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)



13 April 2011

Jesse Scherer  
Action Communications  
315 West 27<sup>th</sup> Street  
Scottsbluff, NE 69361

Re: Tower  
Sidney, NE  
Cheyenne Co.  
H.P. #1104-084-01

Dear Ms. Scherer:

A review of our files indicates that the referenced project does not contain recorded historic resources. It is our opinion that no survey for unrecorded cultural resources will be required. Your undertaking, in our opinion, will have no effect for archaeological, architectural, or historic properties. This review does not constitute the opinions of any Native American Tribes that may have an interest in Traditional Cultural Properties potentially affected by this project.

There is, however, always the possibility that previously unsuspected archaeological remains may be uncovered during the process of project construction. We therefore request that this office be notified immediately under such circumstances so that an evaluation of the remains may be made, along with recommendations for future action.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry Steinacher".

Terry Steinacher  
H.P. Archaeologist

Concurrence:

A handwritten signature in black ink, appearing to read "L. Robert Puschendorf".

L. Robert Puschendorf  
Deputy NeSHPO



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Cheyenne, Nebraska



# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrsc>) or your NRCS State Soil Scientist ([http://soils.usda.gov/contact/state\\_offices/](http://soils.usda.gov/contact/state_offices/)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

## **How Soil Surveys Are Made**

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

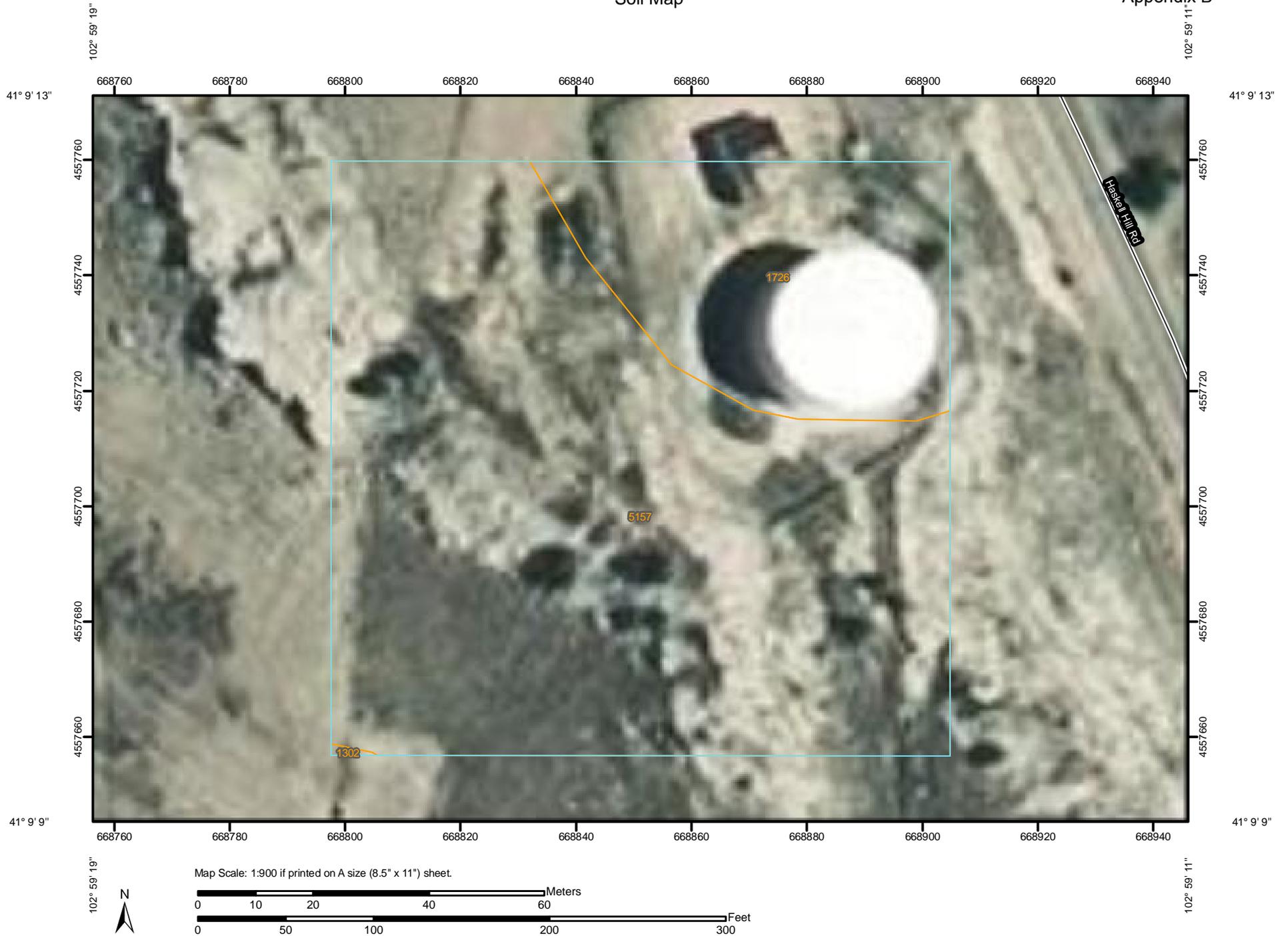
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

## Soil Map

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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report  
Soil Map



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Units

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

-  Very Stony Spot
-  Wet Spot
-  Other

**Special Line Features**

-  Gully
-  Short Steep Slope
-  Other

**Political Features**

-  Cities

**Water Features**

-  Oceans
-  Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### MAP INFORMATION

Map Scale: 1:900 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: UTM Zone 13N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cheyenne, Nebraska  
 Survey Area Data: Version 8, Oct 30, 2009

Date(s) aerial images were photographed: 7/28/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Cheyenne, Nebraska (NE033)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1302	Bayard fine sandy loam, 6 to 9 percent slopes	0.0	0.1%
1726	Rosebud loam, 1 to 3 percent slopes	0.6	23.0%
5157	Canyon-Rock outcrop complex, 12 to 60 percent slopes	2.1	76.9%
<b>Totals for Area of Interest</b>		<b>2.7</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Cheyenne, Nebraska

### 1302—Bayard fine sandy loam, 6 to 9 percent slopes

#### Map Unit Setting

*Elevation:* 3,000 to 5,000 feet  
*Mean annual precipitation:* 16 to 28 inches  
*Mean annual air temperature:* 46 to 55 degrees F  
*Frost-free period:* 130 to 150 days

#### Map Unit Composition

*Bayard and similar soils:* 99 percent  
*Minor components:* 1 percent

#### Description of Bayard

##### Setting

*Landform:* Hillslopes  
*Down-slope shape:* Concave, convex  
*Across-slope shape:* Linear

##### Properties and qualities

*Slope:* 6 to 9 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Available water capacity:* Very high (about 16.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 4e  
*Land capability (nonirrigated):* 4e  
*Ecological site:* Sandy (North) (PE 16-20) (R072XA022KS)

##### Typical profile

*0 to 8 inches:* Fine sandy loam  
*8 to 60 inches:* Fine sandy loam, loamy very fine sand

#### Minor Components

##### Perched wt

*Percent of map unit:* 1 percent  
*Landform:* Swales  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear

**1726—Rosebud loam, 1 to 3 percent slopes****Map Unit Setting**

*Elevation:* 2,500 to 5,500 feet  
*Mean annual precipitation:* 16 to 20 inches  
*Mean annual air temperature:* 46 to 54 degrees F  
*Frost-free period:* 130 to 150 days

**Map Unit Composition**

*Rosebud and similar soils:* 99 percent  
*Minor components:* 1 percent

**Description of Rosebud****Setting**

*Landform:* Hillslopes  
*Down-slope shape:* Concave, convex  
*Across-slope shape:* Linear  
*Parent material:* Loess over weakly cemented fine grained sandstone

**Properties and qualities**

*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
 (0.60 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 15 percent  
*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 5.0  
*Available water capacity:* Low (about 4.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3e  
*Land capability (nonirrigated):* 3e  
*Ecological site:* Loamy Upland (North) (PE 16-20) (R072XA015KS)  
*Other vegetative classification:* Silty - Veg. zone 1 (072XY015NE\_1)

**Typical profile**

*0 to 4 inches:* Loam  
*4 to 15 inches:* Clay loam  
*15 to 30 inches:* Loam  
*30 to 60 inches:* Weathered bedrock

**Minor Components****Lodgepole, frequently ponded**

*Percent of map unit:* 1 percent

*Landform:* Playas  
*Landform position (three-dimensional):* Dip  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Other vegetative classification:* Clayey Overflow - Veg. zone 2 (072XY027NE\_1)

## 5157—Canyon-Rock outcrop complex, 12 to 60 percent slopes

### Map Unit Setting

*Elevation:* 3,000 to 5,000 feet  
*Mean annual precipitation:* 16 to 18 inches  
*Mean annual air temperature:* 46 to 50 degrees F  
*Frost-free period:* 130 to 150 days

### Map Unit Composition

*Canyon and similar soils:* 60 percent  
*Rock outcrop:* 40 percent

### Description of Canyon

#### Setting

*Landform:* Hillslopes  
*Down-slope shape:* Concave, convex  
*Across-slope shape:* Linear

#### Properties and qualities

*Slope:* 11 to 45 percent  
*Depth to restrictive feature:* 6 to 20 inches to paralithic bedrock  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
 (0.60 to 2.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 10 percent  
*Maximum salinity:* Nonsaline (0.0 to 2.0 mmhos/cm)  
*Available water capacity:* Very low (about 2.1 inches)

#### Interpretive groups

*Land capability (nonirrigated):* 7s  
*Ecological site:* Shallow Limy (North) (PE 16-20) (R072XA028KS)

#### Typical profile

*0 to 10 inches:* Fine sandy loam  
*10 to 14 inches:* Loam  
*14 to 60 inches:* Weathered bedrock

### Description of Rock Outcrop

#### Setting

*Landform:* Hillslopes

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Appendix B



# PANHANDLE DRILLING & TESTING Inc.

818 South Beltline Highway East  
Route 2, Box 118  
SCOTTSBLUFF, NEBRASKA 69361

*Phone*  
308-632-6735

## SOIL AND FOUNDATION INVESTIGATION

PROPOSED NEW GROUND LEVEL  
WATER STORAGE TANK

Sidney, Nebraska

Prepared for:

JACOBSON HELGOH CONSULTANTS  
165 South Union Blvd., Suite 670  
Lakewood, Colorado 80228

At the Request of:

CITY OF SIDNEY, NEBRASKA

Job No. B-118

April, 1992

## PURPOSE AND SCOPE OF STUDY

This report presents the results of a soil and foundation study for the proposed new ground level water storage tank to be built for the City of Sidney Nebraska. The tank is to be located in the Southwest Quarter of Section 30 Township 19 North Range 49 West Cheyenne County Nebraska. The study was conducted for the purpose of developing foundation recommendations for the proposed structure. The project location is shown on a portion of the U.S.G.S. quadrangle map which is presented as Figure 1. The proposed facility layout and boring locations are shown on Figure 2.

A field exploration program consisting of six exploratory borings was conducted to obtain information on subsurface conditions. Material samples obtained during the field exploration were tested in the laboratory to determine the classification and general engineering characteristics of the on-site soil. The results of the field exploration and laboratory testing were analyzed to develop recommendations for the structure foundations. The results of the field exploration and laboratory testing are presented herein. This report has been prepared to present the data obtained during the study and to present our conclusions and recommendations based on the proposed construction and subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction of the proposed facilities are included in this report.

## PROPOSED CONSTRUCTION

The ground level water storage tank is to be a welded steel structure approximately 90 feet in diameter by 32 feet in height. The floor of the tank is to be located such that fill from the north side of the tank can be moved to the south side to provide a level site. A blending and disinfection facility approximately 28 foot by 24 foot in plan dimension is also to be constructed on the site.

## SITE CONDITIONS

At the time of the field investigation the site consisted of a vacant area covered with native grasses. The site is located approximately one mile north of the City of Sidney on the high bluff overlooking the City. Lodgepole Creek flows through the City of Sidney approximately one mile south of the site. There are no natural ponds, rock outcrops, or bodies of water located on the site.

## GENERAL GEOLOGY AND GROUNDWATER

The City of Sidney is located on the north side of the valley of Lodgepole Creek. The creek valley is relatively flat and approximately a mile in width. Lodgepole Creek meanders through the City of Sidney. The rocks that outcrop in the area are sedimentary and range in age from Tertiary to Recent. The Brule formation of Oligocene age is the oldest exposed formation and the alluvium of Recent age is the youngest. The bedrock unit of the area consists of Tertiary age Ogallala group sediments. These sediments lie at depths of 30 to 100 feet below ground in the valley area and from 0 to 50 feet below ground on the bluff overlooking the valley. The bedrock unit is composed of poorly to well-cemented sandstones, unconsolidated sand and gravels, siltstones and claystone. Pleistocene to Modern age alluvium mantles the bedrock. These deposits are dominated by sand and gravels mantled with deposits of silt. The hydrology of the area is governed primarily by Lodgepole Creek. However, the bluff on which this site is to be located is approximately 300 feet above the valley and groundwater is not expected to be a problem at this site.

## SUBSURFACE CONDITIONS

The subsurface conditions were explored by drilling six exploratory borings on the site. The borings were made using six-inch OD hollow stem auger. Samples of the subsoils were obtained for classification and laboratory testing. Graphic logs of the borings are presented on Figure 3.

The general subsurface profile found in the borings consist of a thin layer of very fine silty sand varying in depth of 0 to 2 feet. This was underlain by a white to gray sandstone to the maximum depth explored 25 feet. The cuttings from the testholes were brought to the laboratory where they were soaked for 12 hours then a washed gradation analysis was performed on the samples to obtain the soil classification under the Unified Soil Classification System. The results of these gradation analysis are shown on Figures 4 and 5. The analysis showed the material to be a very fine sand which classifies as (SM) under the Unified Soil Classification system. The subsoils prior to washing indicated a moderate reaction to hydrochloric acid thus indicating the presence of lime in the samples. During the drilling it was impossible to determine if the auger was penetrating a solid or unconsolidated formation. Advancement of the auger was very slow however on occasions it was felt that the material being drilled was much denser than the normal formation. Visual inspections of rock outcrops in the area indicate that ledges of very dense highly cemented sandstone are present. The sands between the rock ledges are normally unconsolidated but we attribute this primarily to their exposure to the atmosphere where the lime can be leached from the formation. Of the 25 standard penetration tests conducted in the bore holes only three required less than 100 blows to drive the

sampler 12 inches. Formations which require more than 100 blows to drive the sampler 12 inches are normally considered rock and in the event excavation will be required on this site provisions should be made for defining how the excavation is going to be compensated

Because of our observations of the rock ledges in the area we attempted to drill to a depth of at least 25 feet for the holes located at the tank site and drilled a testhole to a depth of only ten feet at the disinfection building site.

Free water was not encountered in any of the testholes drilled and is not expected to be a problem at this site.

Considering the subsurface conditions encountered in the exploratory borings and the nature of the proposed construction we recommend the facilities be founded on shallow spread footings or on the undisturbed natural soils or properly compacted structural fill.

The penetration resistance values of the soil at estimated foundation levels for the slab-on-grade disinfection and blending building give a relatively high soil bearing pressure. However, we recommend that the structure be founded on footings designed for a maximum allowable soil bearing pressure of 2,000 pounds per square foot.

The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents:

(1) Footings placed on the undisturbed natural soils should be designed for an allowable soil bearing pressure of 2000 pounds per square foot (psf)

(2) Based on our experience with similar subsoils we estimate total settlement for footings placed on the undisturbed natural soils will be approximately one inch. Differential settlement across structures are generally estimated to be approximately one-half to three-quarters of the total settlement

(3) To bridge local nonuniformities spread footings should have a minimum footing width of 16 inches for continuous footings and of 24 inches for isolated pads

(4) Exterior footings and footings beneath unheated areas should be provided with adequate soil cover above their bearing elevation for frost protection (36 inches).

(5) It is recommend that continuous footings be reinforced to function as grade beams designed to inhibit the effects of small differential footing settlement. Grade beam design may be accomplished by using a reinforced concrete foundation wall above

a continuous footing or by increasing the thickness of the footing and incorporating top and bottom steel

(6) Structural fill placed for foundation support should be compacted to at least 100 percent of maximum standard proctor density (ASTM D-698) Structural fill should extend down from the edge of the footings at one horizontal to one vertical projection.

(7) Granular foundation soils should be compacted with a smooth vibratory compactor prior to placement of concrete

(8) Care should be taken when excavating the foundations to avoid disturbing the supporting materials.

(9) If the tank is to be founded on a concrete ring wall we recommend that the ring wall extend to a minimum depth of 36 inches and that the ring walls be proportioned so that the unit soil bearing at the level at the bottom of the wall is the same under the concrete as under the soil. This will limit differential settlement and encourage uniform settlement of the foundation as a whole. Under these conditions the maximum soil bearing pressure for the tank foundation is 3,000 pounds per square foot and settlement is estimated to be on the order of one inch.

(10) A competent soils engineer should observe all foundation excavations prior to concrete placement. Placement and compaction of structural fill for foundation support should be observed and tested on a full-time basis.

#### FLOOR SLABS

The natural on-site soils exclusive of topsoils are suitable to support light to moderately loaded slab-on-grade construction. To reduce the effect of some differential movement floor slabs should be separated from all bearing walls and columns with expansion joints which allow unrestrained vertical movement. Floor slab control joints should be used to reduce damage due to shrinkage cracking. We suggest joints be provided on the order of 15 foot on center. The requirements for slab reinforcements should be established by the designer based on experience and the intended slab use.

All fill material for support of floor slabs should be placed and compacted according to the criteria presented in the "Site Grading" section of this report. The suitability of the on-site soils for use as underslab fill is also discussed in "Site Grading". The on-site soils are generally suitable for use as underslab fill

### WATER SOLUBLE SULFATES

The concentration of water soluble sulfates measured in samples obtained from the exploratory borings range from less than 0.001 percent to approximately 0.004 percent. This concentration of water soluble sulfates represents a negligible degree of sulfate attack on concrete exposed to these materials. The degree of attack is based on a range of negligible positive severe, and very severe, as presented in the U S Bureau of Reclamation Concrete Manual. Based on this information, we believe sulfate resistant cement will not be required for concrete exposed to the on-site soils.

### SURFACE DRAINAGE

Good surface drainage should always be provided away from buildings and pavement. If building foundations on portions of the site are placed on undisturbed natural soils, good surface drainage will be particularly important in these areas. Preventing the wetting of pavement subgrade soils will also be important for the performance of pavements. The following drainage precautions should be observed during construction and maintained at all times after the facility has been completed.

(1) Excessive wetting or drying of the foundation excavation and underslab areas should be avoided during construction.

(2) Exterior backfill should be compacted to at least 95 percent of maximum standard proctor density (ASTM D-698) in pavement areas and to at least 90 percent of maximum standard proctor density in landscape areas.

(3) A positive ground surface slope should be provided away from all buildings and structures. If foundations are placed on the undisturbed natural soils, this slope should be at least ten percent in unpaved areas and three percent in paved areas.

(4) Roof downspouts and other drains should discharge well beyond the limits of the building and structural backfill.

### SITE GRADING

Fill material used inside building limits and within three feet of pavement grade should consist of granular material. The results of the exploratory borings and laboratory tests indicate the on-site soil and bedrock materials are probably suitable for use in pavement subgrade and building underslab fill. Structural fill placed for foundation support should consist of granular on-site materials. Fill should not contain concentrations of organic matter and other deleterious substances. In all cases, a soils engineer should evaluate the suitability of proposed fill material prior to placement.

All fill placed beneath the building floor slabs and pavement should be placed and compacted to at least 95 percent of maximum standard proctor density. Fill placed beneath foundations should be compacted to at least 100 percent of maximum standard proctor density and fill placed in landscape areas may be compacted to 90 percent of maximum standard proctor density.

In fill areas the natural soil surface should be prepared prior to fill placement by removing all organic matter and providing a uniform subgrade for fill placement. In general we anticipate that new fill can be placed directly on the stripped surface however, a soils engineer should observe the conditions prior to fill placement. If dry and loose conditions are observed preparation by moistening and compacting or by scarifying to a depth of eight inches moistening and compacting may be required to provide suitable subgrade.

Site grading should be planned to provide good surface drainage across the entire site. In general buildings and pavement should be elevated above the surrounding ground so that moist conditions do not develop beneath them. Surface diversion features should be provided around buildings and paved areas to prevent runoff concentrations near them.

#### EXTERIOR PAVEMENT

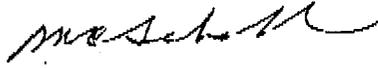
In our opinion, the natural soils will provide adequate subgrade for exterior pavement. Any pockets of very loose soil found in the pavement area should be removed and replaced with soil compacted to 95 percent maximum standard proctor density. In areas where only light vehicular traffic is anticipated the top six inches of the subgrade should be compacted to 95 percent density and a minimum pavement section consisting of five inches of portland cement concrete or six inches of asphaltic concrete is recommended.

#### LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practices in this area for use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon the data obtained from the exploratory borings drilled at the locations indicated on the exploratory boring plan and the proposed type of construction. The nature and extent of subsurface variations across the site may not become evident until excavation is performed. If during construction fill, soil, rock, or water conditions appear to be different from those described herein, this office should be advised at once so re-evaluation of the recommendations may be made.

Respectfully submitted

FOR THE FIRM OF  
PANHANDLE DRILLING & TESTING INC

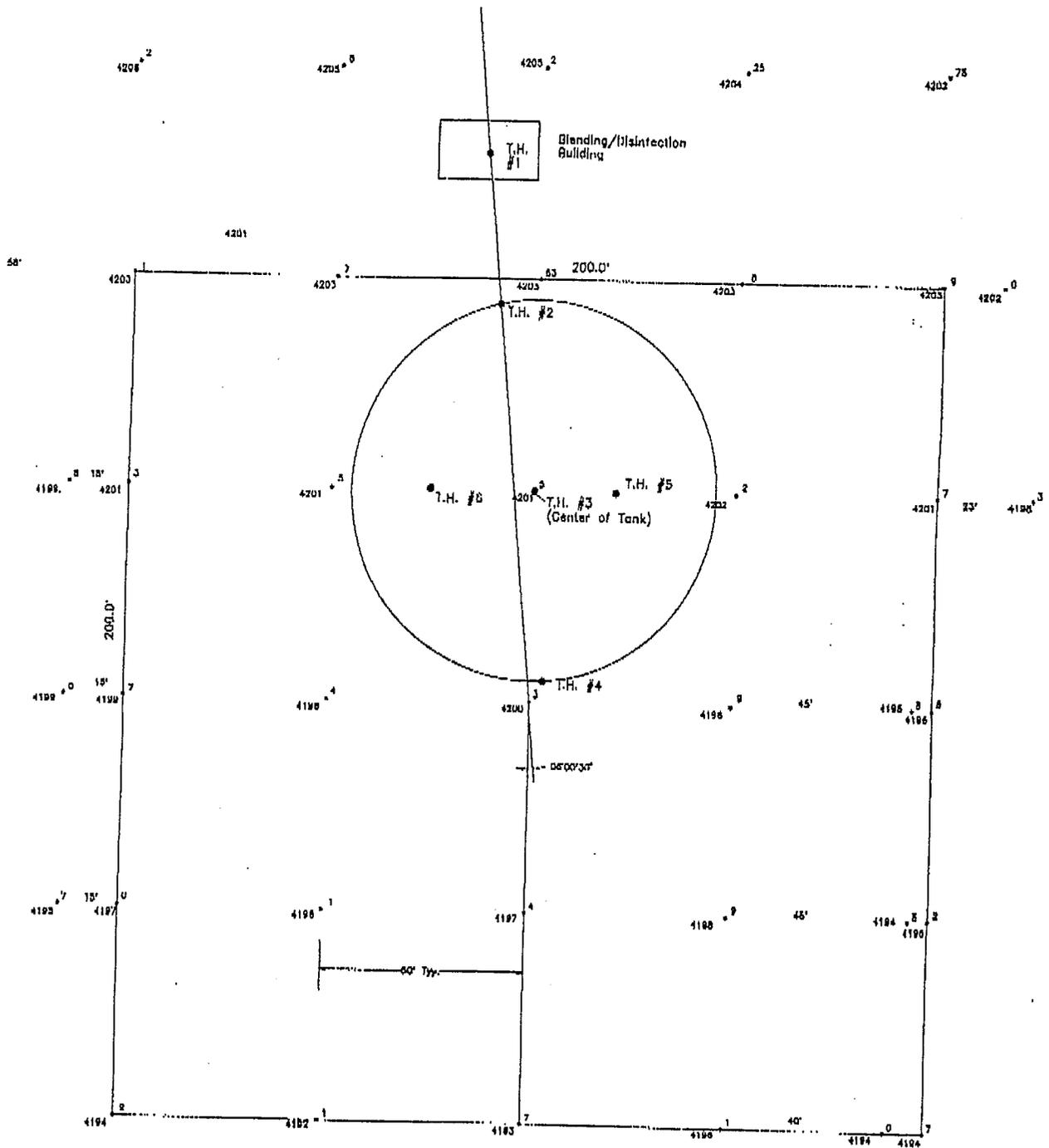
A handwritten signature in cursive script, appearing to read "M.C. Schaff".

M.C. Schaff P.E. , President

MCS:ama



TEST HOLE LOCATIONS Appendix B  
NEW TANK SITE  
SIDNEY, NEBRASKA



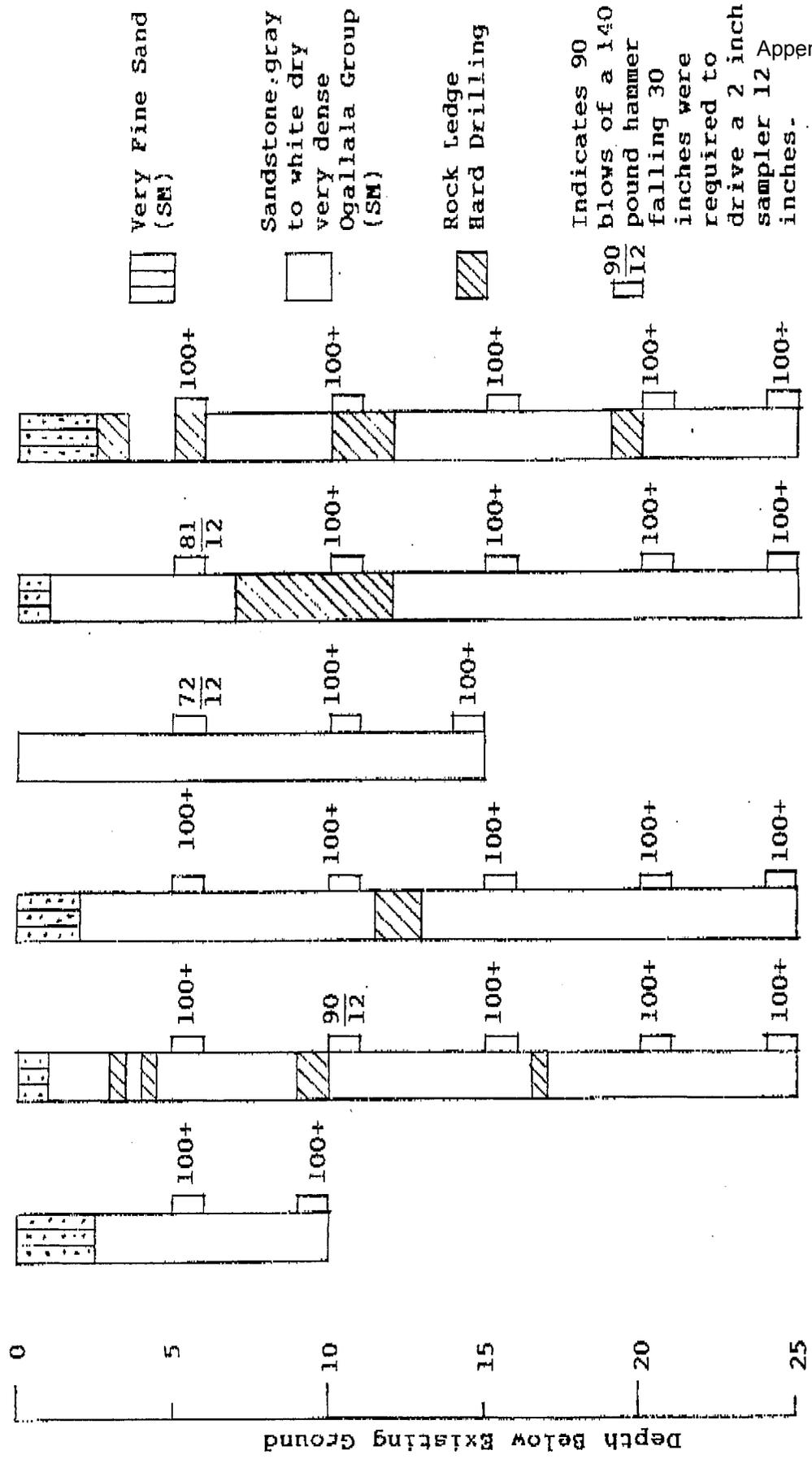
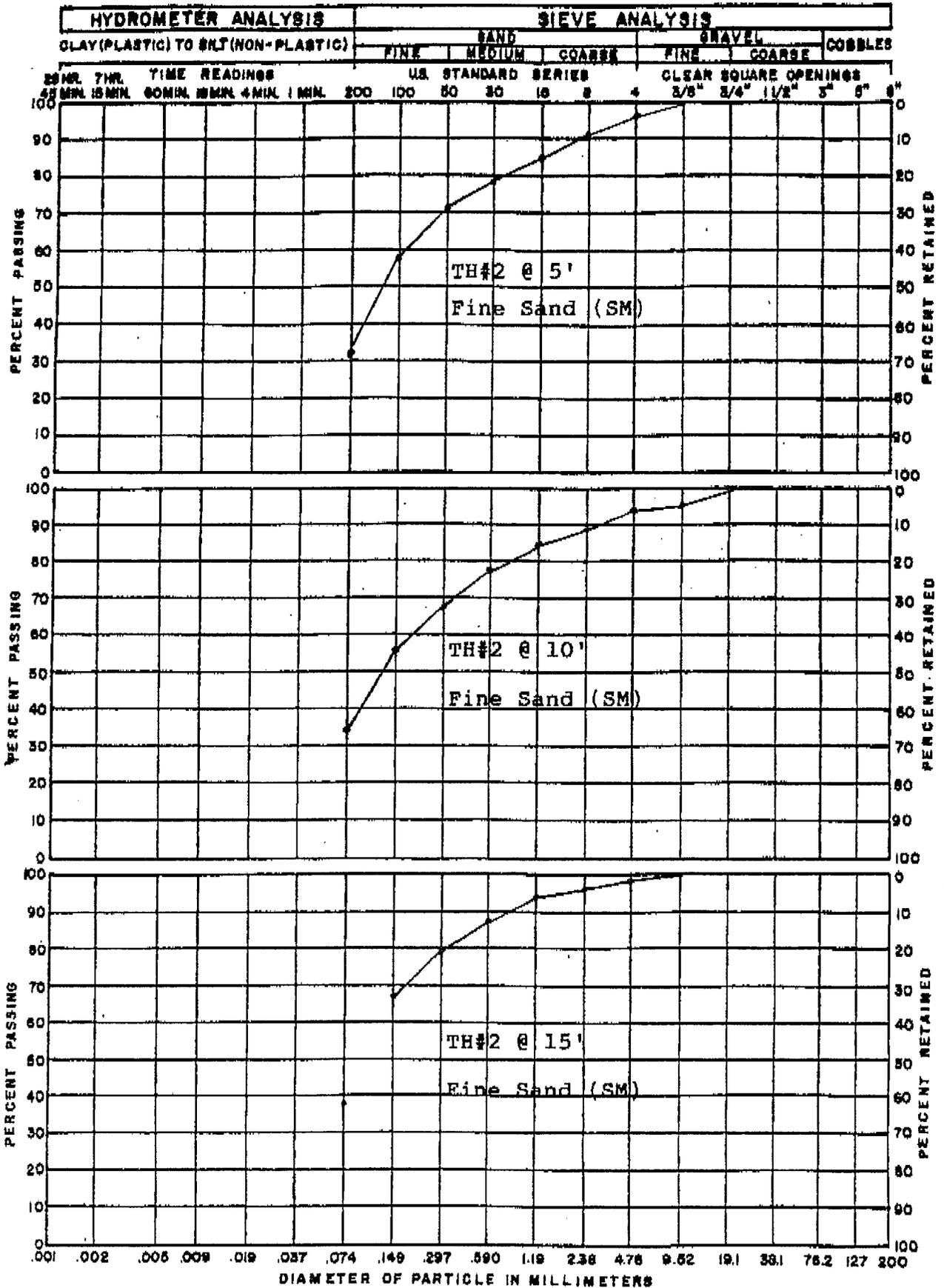
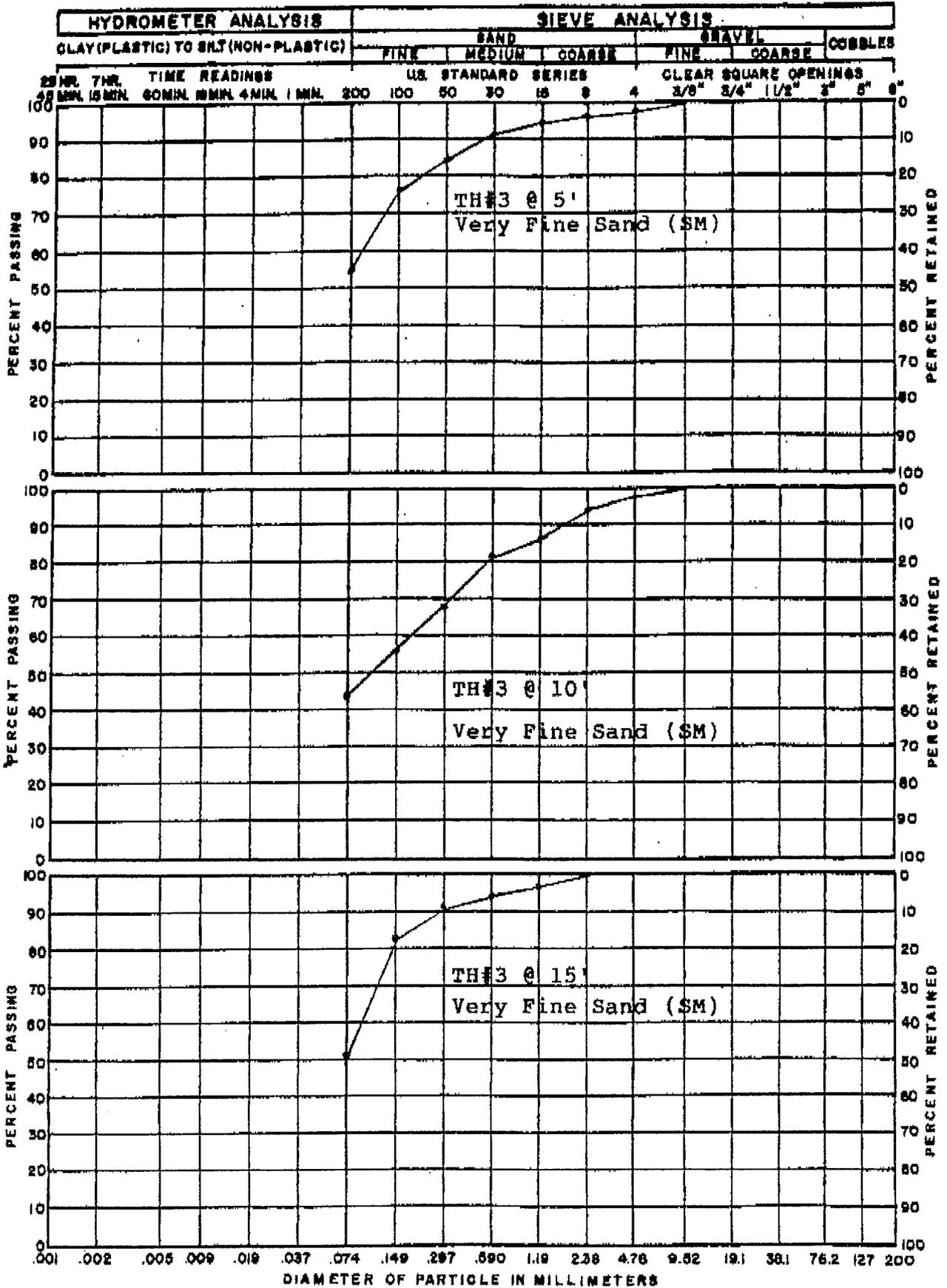


FIGURE #3

# GRADATION ANALYSIS



GRADATION ANALYSIS



PROJECT: Sidney Water Tank

JOB NO. B-118

FIGURE #5

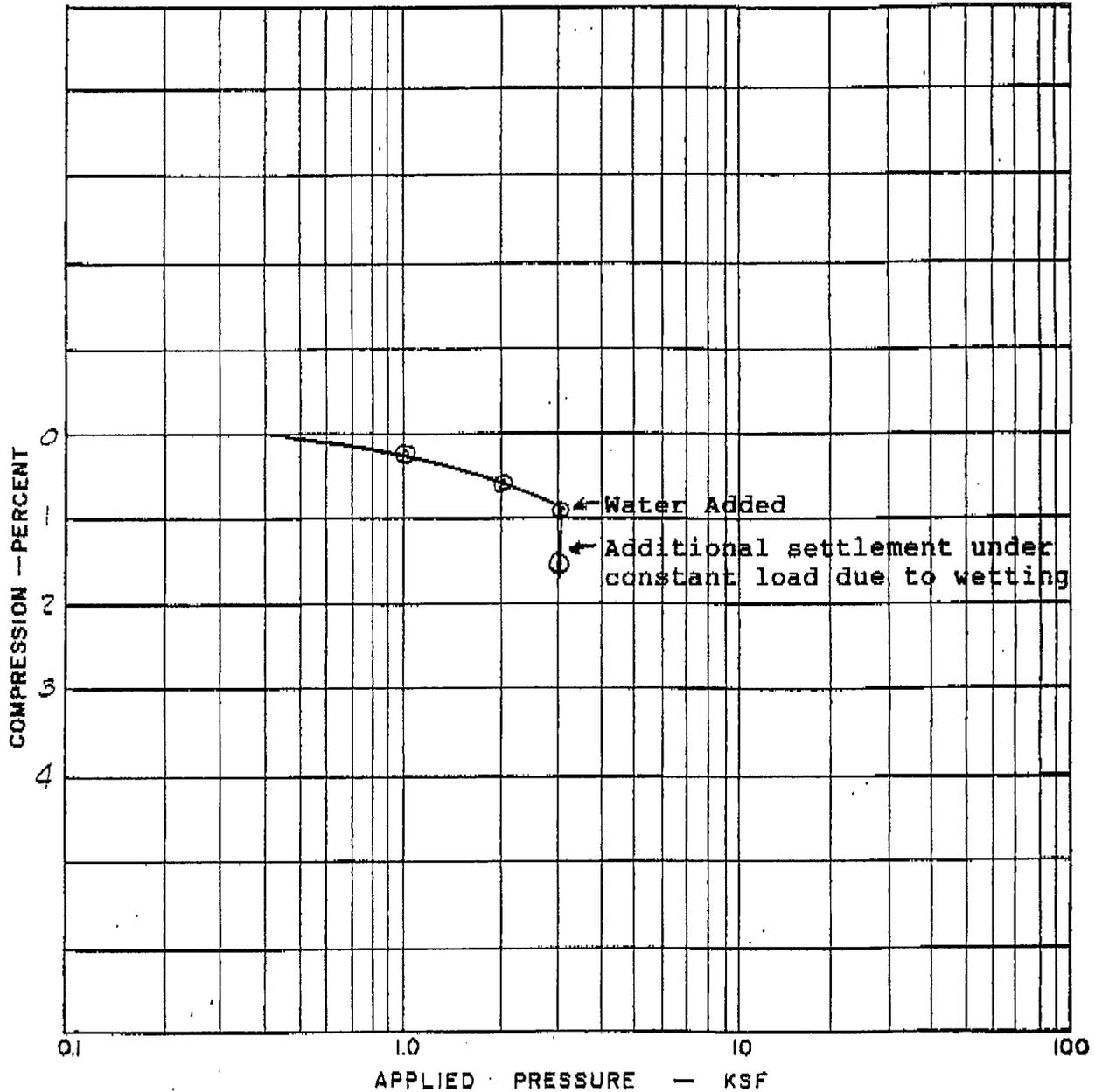
SWELL-CONSOLIDATION TEST RESULTS

Appendix B

NATURAL DRY UNIT WEIGHT (PCF): 97.4

NATURAL MOISTURE CONTENT (%): 2.7

MATERIAL: Find Sand (SM) LOCATION: TH#1 @ 5'



REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PROJECT: Sidney Water Tank JOB NO. B-118

FIGURE #6

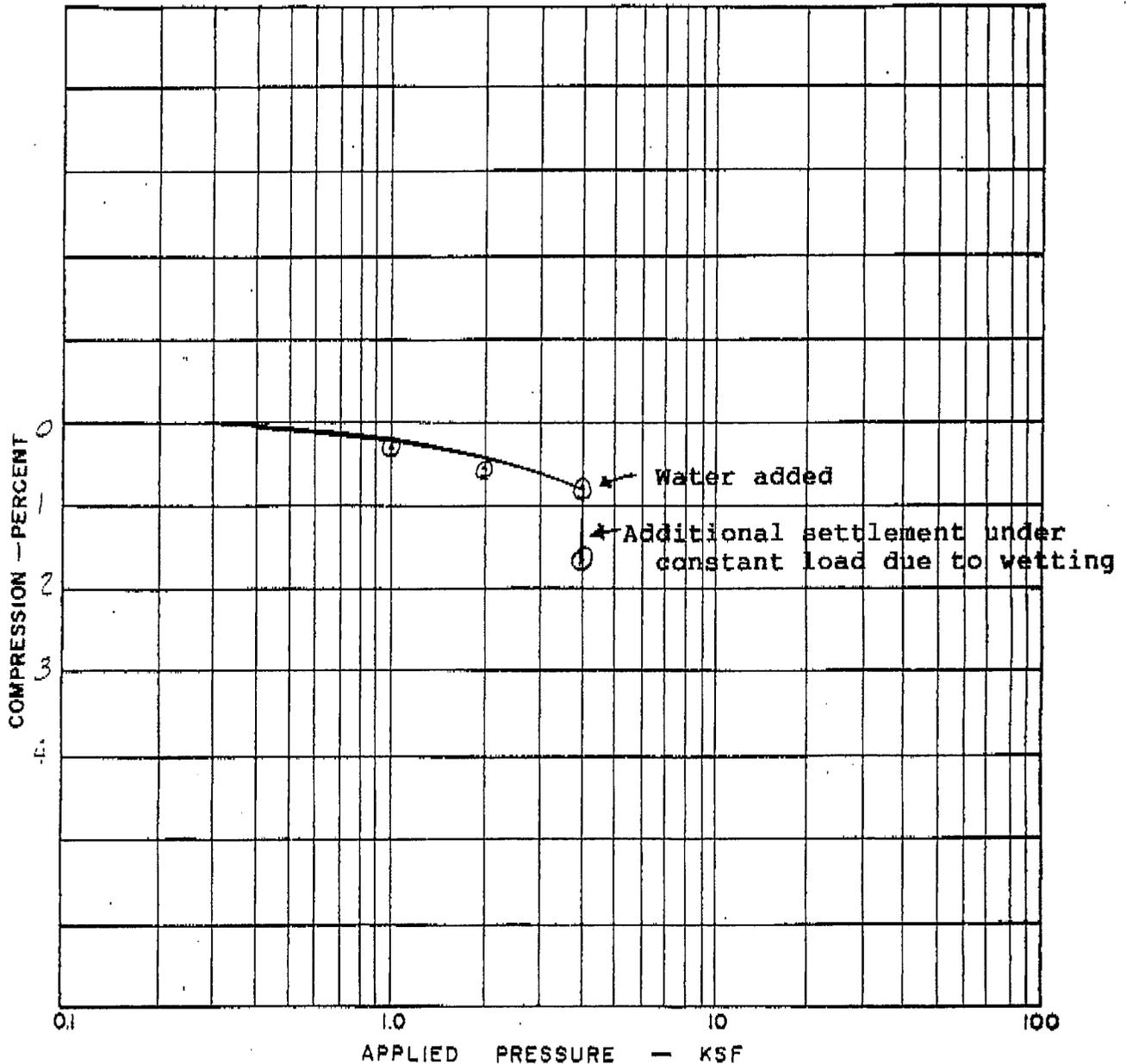
SWELL-CONSOLIDATION TEST RESULTS

Appendix B

NATURAL DRY UNIT WEIGHT (PCF): 94.4

NATURAL MOISTURE CONTENT (%): 5.8

MATERIAL: Fine Sand (SM) LOCATION: TH#3 @ 5'



REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PROJECT: Sidney Water Tank JOB NO. B-118

FIGURE #7

PANHANDLE TESTING LABORATORIES  
SUMMARY OF LABORATORY TEST RESULTS

PROJECT: Sidney Water Tank      JOB NO. B-118      DATE: April 1992

HOLE	DEPTH (FEET)	NATURAL MOISTURE (%)	NATURAL DRY DENSITY (PCF)	ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (PSF)	TRIAxIAL SHEAR TESTS		WATER SOLUBLE SULFATE (%)	SOIL TYPE
				LIQUID LIMIT (%)	PLASTIC INDEX (%)		DEVIATOR STRESS (PSF)	CONFINING PRESSURE (PSF)		
TH-1	5	2.7	97.4		NP				0.001	Fine Sand (SM)
TH-1	10	9.2	89.6							Fine Sand (SM)
TH-2	15	8.8	88.8							Fine Sand (SM)
TH-3	5	5.8	94.4		NP				0.004	Fine Sand (SM)
TH-4	10	9.0	91.6							Fine Sand (SM)
TH-6	15	10.2	93.6							Fine Sand (SM)

FIGURE #8



March 10, 2011

Omaha Tribal Council  
P.O. Box 368  
Macy, NE 68039

To whom it may concern:

The City of Sidney is working on constructing a new communications tower. The tower will be a 300 ft tall guyed tower. This tower will enhance the City of Sidney and corresponding entities enhanced communications and interoperability with state agencies in the area. The plan is in compliance with the State of Nebraska Communications Plan.

Section 106 of the NHPA requires consultation with Federally recognized Indian Tribes who may have potential cultural interests in the project area, and acknowledges that tribes may have interests in geographic locations other than their seat of government.

The tower site is located at coordinates Lat 41.153382 Long -102.988138

We would appreciate your organizations opinion on this project. Please contact me if you have any questions or need additional information.

Thank you for your time and consideration.

Jesse Scherer  
Action Communications  
E-mail: [jscherer@actcom.net](mailto:jscherer@actcom.net)

**Action Communications, Inc.**  
315 West 27<sup>th</sup> Street  
Scottsbluff NE 69361  
800-558-7836 – 308-632-7836 – 308-632-5684 (fax)



March 10, 2011

Ponca Tribal Council  
P.O. Box 228  
Niobrara, NE 68760

To whom it may concern:

The City of Sidney is working on constructing a new communications tower. The tower will be a 300 ft tall guyed tower. This tower will enhance the City of Sidney and corresponding entities enhanced communications and interoperability with state agencies in the area. The plan is in compliance with the State of Nebraska Communications Plan.

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Jesse Scherer  
Action Communications  
E-mail: jscherer@actcom.net

**Action Communications, Inc.**  
315 West 27<sup>th</sup> Street  
Scottsbluff NE 69361  
800-558-7836 – 308-632-7836 – 308-632-5684 (fax)



March 10, 2011

Santee Sioux Tribal Council  
108 Spirit Lake Avenue  
West Niobrara, NE 68760

To whom it may concern:

The City of Sidney is working on constructing a new communications tower. The tower will be a 300 ft tall guyed tower. This tower will enhance the City of Sidney and corresponding entities enhanced communications and interoperability with state agencies in the area. The plan is in compliance with the State of Nebraska Communications Plan.

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**Action Communications, Inc.**  
315 West 27<sup>th</sup> Street  
Scottsbluff NE 69361  
800-558-7836 – 308-632-7836 – 308-632-5684 (fax)



March 10, 2011

Winnebago Tribal Council  
P.O. Box 687  
Winnebago, NE 68071

To whom it may concern:

The City of Sidney is working on constructing a new communications tower. The tower will be a 300 ft tall guyed tower. This tower will enhance the City of Sidney and corresponding entities enhanced communications and interoperability with state agencies in the area. The plan is in compliance with the State of Nebraska Communications Plan.

Section 106 of the NHPA requires consultation with Federally recognized Indian Tribes who may have potential cultural interests in the project area, and acknowledges that tribes may have interests in geographic locations other than their seat of government.

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Thank you for your time and consideration.

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