APPENDIX C

RESOURCES NOT AFFECTED OR MINIMALLY AFFECTED BY THE PROJECT

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APPENDIX C
RESOURCES NOT AFFECTED OR MINIMALLY AFFECTED BY THE PROJECT

This appendix is intended as a supplement to the Nebraska Highway 12 (N-12) Niobrara East and West Environmental Impact Statement (EIS), Chapter 3.0, Existing Environment, and Chapter 4.0, Environmental Consequences. The following addresses the description of and potential impacts on resources that the project would not affect or would affect only minimally: Land Use, Farmland, Noise, Regulated Materials, Air Quality, Social, Economics, Energy, and Climate Change.

Regarding indirect impacts (effects caused by the project but occurring later in time or farther removed in distance from the projects direct impacts), the potential for induced growth is discussed in Section C.1, Land Use, and travel patterns are discussed in Section C.6. As these sections describe, the project would not induce growth nor alter travel patterns. Therefore, no indirect effects would occur as a result of the lack of these related actions.

Figure 3-1 in Chapter 3 illustrates the Study Area. This Study Area will be used for analysis of the resources, unless otherwise noted.

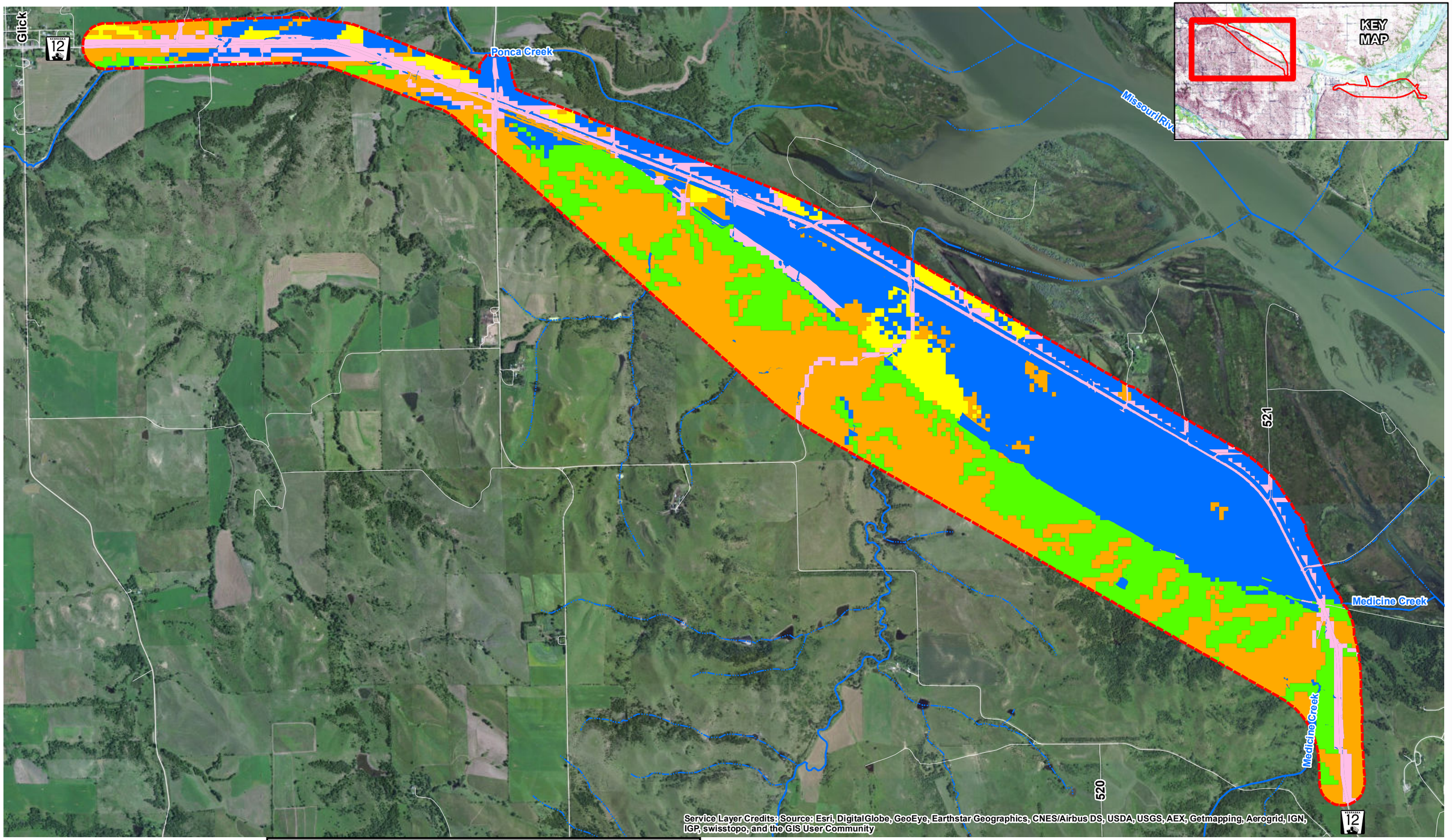
C.1 LAND USE

The majority of the Study Area is rural; however, Niobrara essentially bisects the Study Area into its west and east segments. Additionally, Verdel lies at the western terminus of the project. The topography of the Study Area varies from north to south as flat Missouri River floodplain to steep, wooded Missouri River bluffs. Land uses differ depending on the proximity to Niobrara and the corresponding topography.

According to the draft Knox County Comprehensive Plan, the land uses documented in the Study Area include open water and wetlands in the area of the Missouri and Niobrara rivers, range pasture grass and crop grounds in the floodplain, riparian forest and woodlands, and range pasture grass and crop grounds on the bluffs. Knox County also identifies land use by general categories, including commercial, agri-urban, varying percentages of cultivation, water, and non-agricultural. The majority of the Study Area is classified as 15 to 50 percent cultivated, with the area east of Niobrara classified as less than 15 percent cultivated (Knox County 2012).

The Study Area was superimposed on aerial photographs and overlaid with the 2011 National Land Cover Database (NLCD) to categorize habitat types using ArcGIS software. The 2011 NLCD was developed by the Multi-Resolution Land Characteristics Consortium, which is a group of federal agencies who coordinate and generate consistent and relevant land cover information to the national scale. The NLCD 2011 coverage uses a 16-class land cover classification scheme that is displayed at a resolution of 30 meters and is based on 2011 Landsat satellite data (U.S. Geological Survey 2014). Although natural habitat has been altered by agricultural practices and development in various areas adjacent to the Missouri River, some areas of native grasslands, woodlands, and wetlands still remain. The Nebraska Department of Roads' (NDOR's) wetland determinations were used to classify the wetland areas within the limits of construction. Finally, a windshield survey confirmed land use within the limits of construction. The land uses are described below and are shown in Figures C-1a and C-1b.

Land use was evaluated by determining the direct and indirect effects of the project on existing land use (for example, rangeland, agriculture, residential, and commercial/industrial) and by verifying that the project is consistent with development patterns and land use planning. Direct effects on existing land use may occur through the acquisition of new right-of-way (ROW) for roadway construction. Direct effects include the disruption of regular activities and conversion of land uses such as agricultural land or pasture to ROW. Indirect effects were assessed by evaluating access restrictions that would cause out-of-distance travel or create a change in land use or induced growth further removed in time and distance from the Study Area.



Legend

- Waterway
- Road
- Study Area

Land Use Within Study Area

- Agriculture
- Open Water / Wetlands
- Range, Pasture, Grass
- Road/Built Up
- Woodland

0 1,000 2,000
Feet

Land Use

West Segment

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

NEBRASKA 12
N-12 Niobrara East & West

DATE
October 2015

FIGURE
C-1a

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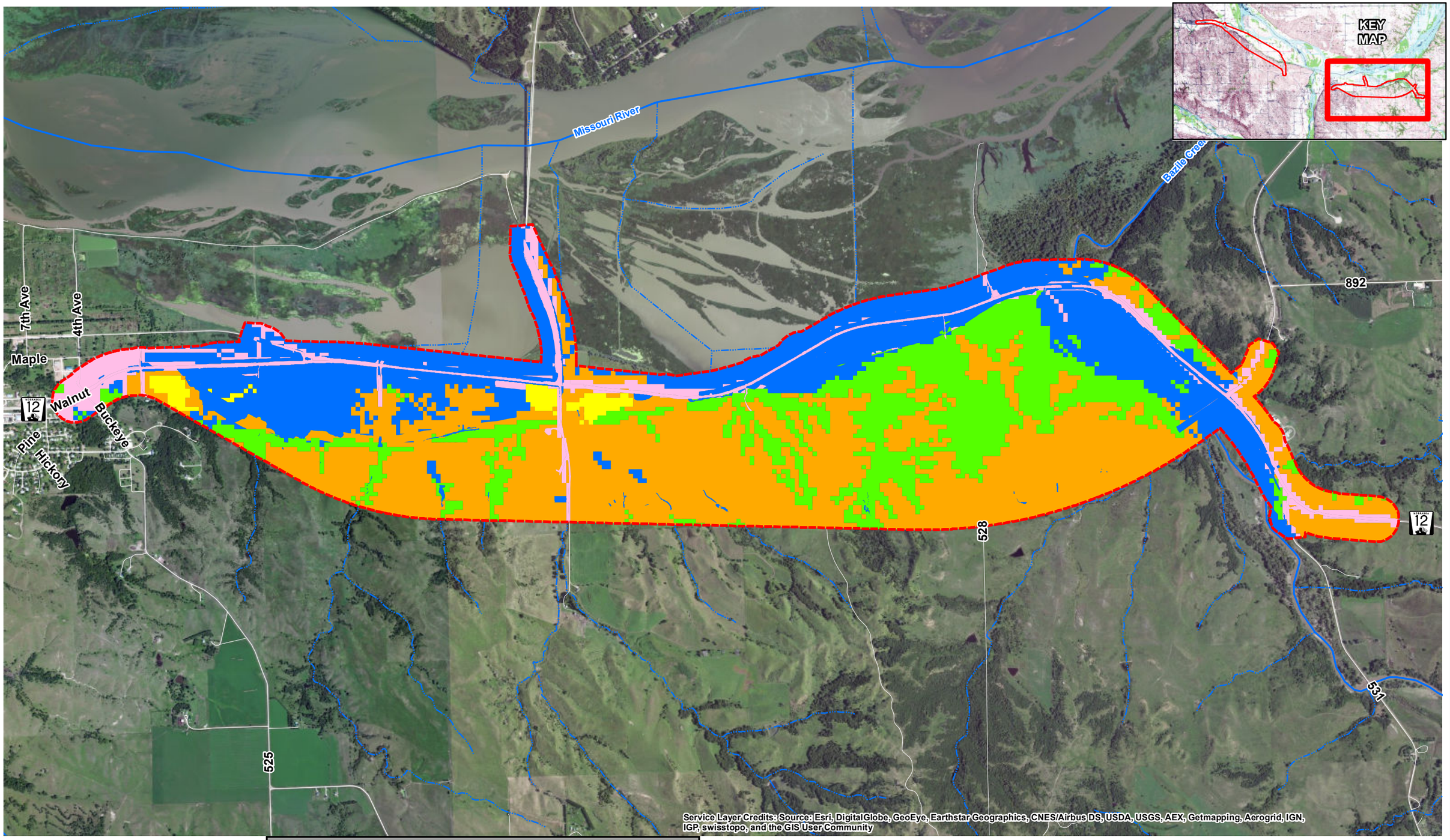

Legend

- Waterway
- Road
- Study Area

Land Use Within Study Area

- Agriculture
- Open Water / Wetlands
- Range, Pasture, Grass
- Road/Built Up
- Woodland

0 1,000 2,000
Feet

Land Use

East Segment

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

DATE
October 2015

FIGURE
C-1b

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C.1.1 Existing Conditions

What is rangeland?

Rangeland is defined as a land cover or use in which "the climax or potential plant cover is composed principally of native grasses, grasslike plants, forbs or shrubs suitable for grazing and browsing" (USDA NRCS 2001).

Rangeland and Agriculture

The Study Area is dominated by rangeland, which includes pastures, range, and grasslands, especially in the rugged bluffs south of the Missouri River floodplain. Within the Missouri River floodplain and small valleys between bluffs, sporadic areas are in agricultural production. Primary agricultural crops are corn, soybeans, and alfalfa for hay production. Several farmsteads exist in the Study Area.

Census of Agriculture reports from the U.S. Department of Agriculture (USDA) were reviewed for information about farms in Knox County. Generally, farms, rangeland, and agriculture lands were decreasing in the county from 1992 to 2007; however, there appeared to be an increase in the land in farms and total cropland in 2012 (see Table C-1). See Section C.2 for further discussion of farmland.

Table C-1
Census of Agriculture Data for Knox County, 1992-2007

Year	Number of Farms	Land in Farms (acres)	Average Size of Farm (acres)	Total Cropland (acres)
1992	1,086	612,694	564	363,369
1997	1,053	595,537	1,734	327,165
2002	1,016	599,468	590	332,418
2007	863	536,457	622	273,593
2012	1,080	627,735	581	326,636

Sources:
USDA. 1992. "Census of Agriculture Nebraska State and County Data." http://www.agcensus.usda.gov/Publications/1992/State_and_County_Highlights/datafile/nec054.txt.
USDA. 1999. "1997 Census of Agriculture. Nebraska State and County Data." http://www.agcensus.usda.gov/Publications/1997/Vol_1_National,_State_and_County_Tables/ac97ane.pdf.
USDA. 2004. "2002 Census of Agriculture. Nebraska State and County Data." http://www.agcensus.usda.gov/Publications/2002/Volume_1,_Chapter_2_County_Level/Nebraska/NEVolume104.
USDA. 2009. "2007 Census of Agriculture. Nebraska State and County Data." http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Nebraska/nev1.pdf.
USDA. 2014. "2012 Census of Agriculture. Nebraska State and County Data." http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Nebraska/

What is woodland?

Woodland, also referred to as forestland, is defined as a land cover or use that is "at least 10 percent stocked by single stemmed forest trees of any size which will be at least 4 meters (13 feet) tall at maturity" (USDA NRCS 2001).

Woodland

Woodlands are common in the bluffs. Native trees such as eastern red cedar, bur oak, and green ash grow in drainage areas and form wooded draws. Riparian woodland communities of cottonwood, willow, elm, and silver maple grow in the floodplains.

Water/Wetlands

As the groundwater table has increased in the floodplains of the Study Area, so have the quantity and size of wetlands (Corps 2011). Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plants and animals living in the soil and on its surface. Additional information on wetland resources in the Study Area is provided in Section 3.5, Wetlands and Waters of the U.S.

Urban

This land use category combines residential areas, commercial and industrial areas and roadways and embankments. The majority of the residential area, much of which is outside of the Study Area, lies within the jurisdictional limit of the Village of Niobrara. Housing in Niobrara is generally moderate to high density. Outside of Niobrara, several farmsteads exist in the Study Area.

Nearly all of the commercial and industrial development in the vicinity of the Study Area is located in Niobrara. Businesses in Niobrara are mainly service related and effectively serve the townspeople of Niobrara, surrounding farmers and ranchers, and tourists who visit the area. Within the Study Area east of Niobrara, Niobrara Outfitters Co., a waterfowl hunting operation, leases land north of N-12. Just west of the western terminus of the Study Area, multiple service-related businesses are present in Verdel.

Along with N-12, several county roads traverse the Study Area. This land use category includes existing roadways and their embankments.

Publicly Accessible Lands

Because the project is adjacent to the substantial natural resources associated with the Missouri and Niobrara rivers, large, publicly accessible areas exist within or in close proximity to the Study Area. These areas largely consist of natural or minimally developed areas that provide public access to the Missouri and Niobrara rivers and their associated amenities. Publicly accessible land in the vicinity of the Study Area is listed below from west to east and is shown in Chapter 3.0, Existing Environment, Figure 3-1; further detail on each area is provided in Section 3.9, Recreation:

- Missouri National Recreational River (MNRR) (39-Mile District)
- Verdel Landing Wildlife Management Area (WMA)
- Niobrara State Park
- Bazile Creek WMA
- Ferry Landing WMA
- Lewis and Clark State Recreation Area (SRA)

Impacts on publicly accessible land are limited to the Bazile Creek WMA. These impacts would not change how Bazile Creek WMA is used by the public, or how it is managed by the Nebraska Game and Parks Commission. Impacts on acres of MNRR were not assessed because the National Park Service (NPS) does not own the land designated as the MNRR.

Santee Sioux Reservation

The Santee Sioux Reservation was established in 1866 and lies in the north-central part of Knox County and in the eastern portion of the Study Area. The Reservation covers approximately 175 square miles. Reservation land use in the Study Area is mostly agriculture or rangeland, but the Santee Sioux Nation also maintains two commercial properties, Ohiya Casino & Resort and the Feather Hill Express gas station, along N-12, east of the Study Area. In addition, the Santee Sioux Nation also owns the property of the former Ohiya Casino & Bingo, which has been converted to commercial real-estate. The portion of the Santee Sioux Reservation in the Study Area is shown in Chapter 3.0, Existing Environment, Figure 3-1.

C.1.2 No-Action Alternative

The No-Action Alternative represents a continuation of the current base conditions for the Study Area; therefore, current land uses in the Study Area would remain unchanged. Land uses are expected to remain primarily rangeland and agriculture.

C.1.3 Action Alternatives

A detailed discussion of impacts on wildlife habitat (rangeland, agriculture, woodland and water/wetlands) is found in Section 4.2, Fish and Wildlife, and a detailed discussion of impacts on wetlands and waters of the U.S. is found in Section 4.5.

Under the Action Alternatives, direct impacts on existing land use would occur from conversion of existing land uses to new ROW. The ROW, acquisition, and relocations necessary for each Action Alternative are discussed in Section 4.11; the acres of ROW required for each Action Alternative are shown in Table 4-8. Table C-2, below, shows the acres of impact on existing land use calculated from Alternative A7's permanent area of impact. The permanent area of impact for each alternative is the area of the project that would be changed during construction and not restored to its original state. This includes areas of fills, cuts, channel re-alignments, or other permanent changes to the landscape.

Impacts on residential and commercial properties would be minimal. Acquisitions and relocations are discussed in Section 4.11. A change in land development patterns (induced development) following project construction is not anticipated due to the rural nature of the Study Area. As discussed in Section 3.5, the extensive wetland complexes that occur in the Missouri River floodplains are only expected to grow, limiting the areas available for development within the Study Area. In addition, the project is to replace the existing roadway, not provide new access to areas that previously did not have a transportation corridor or provide new access from the existing corridor. In areas adjacent to the Study Area, some economic development has occurred while the road is in its current state, most notably, the construction of the expanded Ohiya Casino. The Ohiya Casino was moved from within the Study Area to just east of the east segment. However, population decline continues in the County as well as within the Study Area (see Section C.6). This includes the period of time following the completion of Chief Standing Bear Memorial Bridge (1998) which provided a direct link from Nebraska to South Dakota on (from N-12 via N-14 to South Dakota State Highway 37). Therefore, it would be speculative to assume, given the development trends in this area, that a new roadway within an existing transportation corridor would induce development.

Impacts on publicly accessible land would be limited to direct impacts on Bazile Creek WMA. A detailed discussion is found in Section 4.9, Recreation.

The Action Alternatives would all transverse the Santee Sioux Reservation but would follow closely the existing N-12 alignment in that area. All of these Action Alternatives would travel past Ohiya Casino & Resort, east of the Study Area, which would not disrupt the economic opportunities of the Santee Sioux.

The Action Alternatives would have little or no indirect effect on land use as existing access to private and public lands would remain essentially the same. The project would not alter traffic patterns, thus having no effect on existing or future land use. Alternative A1 requires a temporary two-lane road during construction, but all access points (intersections with county roads and private crossings) would remain open during construction to the greatest extent possible.

Table C-2
Land Use Impact Summary

Land Use Type	Alternative A1		Alternative A2		Alternative A3		Alternative A7	
	West	East	West	East	West	East	West	East
Rangeland (ac)	4	10	5	16	13	43	13	43
Agriculture (ac)	1	1	1	5	15	8	15	8
Woodland (ac)	4	4	2	12	35	32	35	32
Water/Wetland (ac) [1]	21	71	41	72	60	79	60	79
Roadways/Embankments (ac)	48	53	23	34	20	31	20	29
Bazile Creek WMA (ac)[2]	0	52	0	47	0	68	0	68
Residential (ac)	0	1	0	2	0	2	0	2
Commercial/Industrial (ac)	0	2	0	0	0	0	0	0
Santee Sioux Reservation	0	27	0	35	0	45	0	45

Notes:
[1] *Impacted water/wetlands are only those areas outside of existing ROW and within the proposed new ROW.*
[2] *Impacted publicly accessible lands are direct impacts on Bazile Creek WMA.*

C.1.4 Avoidance, Minimization, and Mitigation

Knox County has a comprehensive plan (Knox County 2012) that describes its future land use plan. The basic principles and concepts designed to meet the challenge of growth and preservation of rural character in the county include:

- Maintenance of rural character
- Value of resource conservation
- Gradient of development
- Interlinked network of open space
- Special residential environments
- Conservation development
- Lakeside development

Knox County has developed a zoning ordinance based of their future land use plan. The majority of the Study Area is within the Transitional Agricultural or Primary Agricultural zoning districts. These districts are similar in their approved land uses. Differences include:

- Medium and large animal feeding operations not allowed in Transitional Agriculture (small operations are a conditional use). All sizes are conditional uses in Primary Agriculture.
- Businesses (such as restaurants and distributors) are conditional uses in Transitional Agriculture and not allowed in Primary Agriculture.

The Action Alternatives are consistent with the roadway staying at or near its current location. Land use decisions for land adjacent to any Action Alternatives are at the discretion of Knox County. The roadway itself is not inconsistent with the existing land use plan or zoning ordinance. Therefore, no mitigation with respect to land use would be required.

NDOR would coordinate with the Corps to replace lands in flowage easements directly impacted by the project.

C.2 FARMLAND

The Farmland Protection Policy Act of 1981 (FPPA) (7 Code of Federal Regulations [CFR] 658) requires that Federal projects minimize the conversion of farmland to nonagricultural uses. To the extent practicable, state and local farmland policies are to be considered. Farmland is defined as prime or unique farmland or farmland of statewide or local importance.

What is prime farmland?

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses (that is, the land can be cropland, pastureland, rangeland, wooded, or other land but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods (7 CFR 657.5). Some soils that have a high water table and soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. These areas are given the classification of "prime farmland if drained," which refers to land that is currently drained for agricultural purposes.

What is unique farmland?

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods (7 CFR 657.5).

What is farmland of statewide or local importance?

Farmland of statewide or local importance is land identified by state or local agencies for the production of food, feed, fiber, forage, or oilseed crops, but is not of national significance (7 CFR 657.5).

C.2.1 Existing Conditions

As discussed in Section C.1, Land Use, the Study Area is dominated by rangeland, which includes pastures, range, and grasslands. Agricultural crop fields are located in the floodplain near the Missouri and Niobrara rivers and small valleys between bluffs. These areas are dedicated to row crop and hay production. Corn, soybeans, and alfalfa are the primary commercial crops grown. A large portion of the land consists of natural or minimally developed areas.

C.2.2 No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed and farmland would not be affected.

C.2.3 Action Alternatives

To assess farmland, impacts were considered through a qualitative as well as a quantitative evaluation. A USDA Natural Resources Conservation Service (NRCS) form titled Farmland Conversion Impact Rating for Corridor Type Projects (Form NRCS-CPA-106) was completed for each Action Alternative to assess the effects of farmland conversion on farming and farm-related services in the Study Area. This assessment considers the effects that conversion of farmland as a result of the project would have on existing and future land use, the amount of existing farmable land in Knox County, the creation of economically non-farmable parcels, impacts on other on-farm investments, and effects on local farm services.

For each Action Alternative, the acres of farmland within the permanent impact area were calculated, as shown in Table C-3. Then each Action Alternative was rated using Form NRCS-CPA-106, which assigns points to each criterion for a total possible score of 160 points. This score for each Action Alternative is also shown in Table C-3. This relative value takes into account attributes that add value to the farmland, such as percent being farmed, area in non-urban use, and on-farm investments (7 CFR 658). Form NRCS-CPA-106 for each Action Alternative is provided in Appendix J.

Table C-3
Farmland Impacts for Each Action Alternative

Alternative	Directly Converted Farmland (acres)	Score of Form NRCS-CPA-106[1]
A1	29.2	40
A2	34.9	40
A3	70.8	56
A7	70.8	56

Note:
[1] *Total score of Part VI of the NRCS-CPA-106 form, out of a total of 60 points.*

The point values for all of the Action Alternatives are below the threshold (60 points) for NRCS to complete their parts of the CPA-106 form. Even if NRCS scored the remaining parts with the maximum 100 points, the total point value would not exceed 160 and the significance criteria for farmland impact would not be reached. Therefore, any N-12 Action Alternative would not have an impact on farmland per NRCS criteria.

As stated in Land Use above, no indirect effects (induced growth) are anticipated, given the rural setting of the project.

C.2.4 Avoidance, Minimization, and Mitigation

Based on the constraints of establishing viable Action Alternative corridors in the Study Area, farmland could not be avoided. Preliminary design involved consideration of diagonal severance (that is, the indirect take of farmland by intersecting a parcel) to minimize potential impacts on farmland.

C.3 NOISE

What is frequency?

Frequency refers to the number of sound waves produced in a given time period.

In general, noise can be defined as unwanted sound. Sound is produced by the vibration of sound pressure waves in the air, and sound pressure levels are expressed in units called decibels (dB). Sound also is composed of various frequencies. The human ear is efficient at blocking out very low- and high-frequency sound. Frequencies to which the human ear does not respond must be filtered out, or scaled, when evaluating traffic noise levels. Traffic noise consists of vehicular engine noise and tire noise from contact with the roadway surface. The type of scale that best approximates the frequency response of the human ear is called the A-scale. Therefore, noise levels are measured as and reported in A-weighted decibels (dBA). Table C-4 provides noise levels (in dBA) common to everyday activities.

Table C-4
Common Noise Levels

Activity/Distance	Noise Level (dBA)
Rock band at 16 feet	110
Jet flyover at 1,000 feet	105
Gas lawn mower at 3 feet	95
Diesel truck at 50 feet at 50 miles per hour	85
Gas lawn mower at 100 feet	70
Normal speech at 3 feet	65
Dishwasher in the next room	50
Theater background noise	40
Library	30
Lowest threshold of human hearing	0

Source:
Hendriks, Rudy. 1998. "Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol." California Department of Transportation. October. http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf.

NDOR has developed a noise policy consistent with the Federal Highway Administration (FHWA) noise abatement criteria (NAC) and procedures to use in the planning and design of highways (NDOR 1998). The FHWA policy and associated criteria and procedures are set forth in 23 CFR 772. The NAC noise level is 67 dBA for residential dwellings and 72 dBA for commercial receivers. Impacts occur when the predicted traffic noise levels approach (within 1 dBA) or exceed the NAC or when they substantially exceed the existing noise levels.

C.3.1 Existing Conditions

The majority of the Study Area consists of natural wooded and wetland area or is in agricultural production (pasture or crop production) in a predominantly rural environment. Niobrara bisects the two segments of N-12 in the Study Area, and there are a small number of farmsteads adjacent to the highway. Verdel is located west of the Study Area. Aside from N-12, which is an asphalt-paved, two-lane highway, the existing roads in the Study Area are granular-surfaced county roads with asphalt-paved intersections with N-12, South Dakota Highway 37 (SD-37), and Nebraska Highway 14 (N-14). Noise levels in the Study Area are varied, with relative tranquility in natural areas, typical

sounds in more developed areas near towns, and seasonal sounds of motorboats in other areas (NPS 1997).

A noise study was conducted in 2008 to identify current noise levels for the Study Area (see Appendix I). Noise monitoring was performed at representative noise receivers along N-12 to determine existing noise levels, and computer-generated noise modeling was completed and compared to the readings at the monitoring locations to verify their accuracy. In addition, noise monitoring was performed at representative noise receivers throughout the Study Area to determine noise levels. Noise modeling was not necessary for establishing existing noise levels because there is currently no traffic in most of the Study Area.

Under natural conditions, birds chirping, leaves rustling, and wind blowing would cause noise levels in the most serene places to be approximately 40 dBA. In the Study Area, which is primarily rural in nature, existing noise levels range from 48 to 56 dBA, with an average of 52 dBA.

The anticipated sources and levels of noise in and near Alternatives A1, A2, A3, and A7 are discussed below.

C.3.2 No-Action Alternative

The No-Action Alternative represents a continuation of the current base conditions for the Study Area. Sources and levels of noise in the Study Area would remain consistent with existing conditions.

C.3.3 Action Alternatives

Land use adjacent to all of the Action Alternatives is primarily agricultural, with occasional commercial or residential receivers. As discussed in the Noise Study Report (see Appendix I), no residences or commercial developments along any of the alignments would experience noise levels approaching or exceeding the FHWA NAC.

The existing noise levels along N-12 (2012 traffic volumes) and predicted noise levels (future design year 2034) for the Action Alternatives were evaluated. Some of the receivers were placed in areas where existing noise levels were unrealistically low. As discussed above, under natural conditions, birds chirping, leaves rustling, and wind blowing, factors not accounted for in the FHWA Traffic Noise Model (TNM), would cause noise levels in the most serene places to be approximately 40 dBA. To correct for this flaw, a noise meter was used to calculate background noise levels at several serene locations in the Niobrara area. The average noise level was determined to be 48 dBA, which was used for background existing levels.

- Alternative A1 – Predicted noise levels range from 48 to 58 dBA, with an average of 53 dBA. The area is mostly undeveloped with limited residential and commercial land uses.
- Alternative A2 – Predicted noise levels range from 48 to 58 dBA. The area is primarily rural in nature. Higher noise levels may occur along the river portions of the Action Alternatives because of the seasonal use of airboats and motorboats.
- Alternatives A3 and A7 – Predicted noise levels range from 48 to 59 dBA. The area is predominantly rural.

No indirect effects are anticipated for the Action Alternatives because the project would not change traffic patterns or induce development.

C.3.4 Avoidance, Minimization, and Mitigation

No avoidance, minimization, or mitigation measures are proposed. Noise abatement measures were not analyzed as no receivers were impacted. For a discussion of short-term noise impacts during construction and possible mitigation, see Section 4.13, Construction.

C.4 REGULATED MATERIALS

Properties in the Study Area where regulated materials have been stored or used may present a future risk if spills or leaks have occurred. Contaminated or potentially contaminated properties are of concern for transportation projects because of the associated liability of acquiring the property through ROW purchase, the potential cleanup costs, and safety concerns related to exposure to contaminated soil, surface water, or groundwater.

Environmental Data Resources, Inc. (EDR) identified and compiled publicly available environmental records for properties within the Study Area. The records search identified sites that are included in one or more federal and state databases of properties with recognized environmental conditions (RECs), and the EDR report identified the approximate locations of those sites (EDR 2008). A REC is a property that is listed on a database that identifies the existence of hazardous materials and waste, either from the presence of stored materials or from past spills or leaks.

A survey was conducted on September 29 and 30, 2008, to identify sites with RECs. This involved a visual inspection of EDR-listed sites within the Study Area and notation of any other properties or conditions of concern not identified in the EDR report (see Appendix G).

The properties with potential risks were ranked according to the following criteria:

- High Risk – Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites; Resource Conservation and Recovery Act (RCRA) corrective action sites; RCRA Treatment, Storage, and Disposal Facilities sites; Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites; RCRA sites under administrative orders; former manufactured gas plant sites; or any property where evidence of a release of regulated materials was observed during the site visit
- Moderate Risk – Leaking Underground Storage Tank (LUST) sites that have not received a No Further Action (NFA) designation; automobile junkyards and salvage yards; and commercial/industrial facilities where the potential for regulated materials was observed during the site visit and inadequate housekeeping practices were observed to an extent that the potential for environmental contamination is higher than if normal waste management practices had been followed
- Low Risk – LUST sites with an NFA designation; RCRA Registered Small or Large Generators of Hazardous Waste (RCRA Small Quantity Generator or RCRA Large Quantity Generator); CERCLIS sites with a No Further Remedial Action Planned determination; underground storage tank sites; above-ground storage tank (AST) sites; permitted users or generators of regulated materials for which releases are not listed in databases or other documentation; sites regulated under air emissions permits; animal confinement operations

sites; and commercial/industrial facilities where the potential for regulated materials to be present was observed during the site visits but no evidence of releases was observed or reported

- Minimal Risk – Houses, farms, agricultural land, vacant or timbered land, and commercial properties where a low potential or no potential for regulated materials to be present was observed during the site visit

C.4.1 Existing Conditions

Based on the EDR report and the September 2008 site visit, it was determined that 20 properties in the Study Area are reasonably likely to have associated low risk while one property is likely to have high risk. The remainder of the Study Area was considered to present minimal risk. No sites contained RECs with moderate risk. In Chapter 3.0, Existing Environment, Figure 3-1 shows the locations of the high-risk site in the Study Area. The following information regarding the high-risk site provides a better understanding of its potential contamination issues:

- Niobrara Landfill East – The EDR report listed Niobrara Landfill East as an orphan site listed in the FINDS database. An orphan site is one that could not be mapped by EDR; in this case, the Niobrara Landfill East was listed with no address. Based on communications with the Knox County Assessor's Office and the Village of Niobrara, it was determined that the landfill is currently a 10.78-acre parcel located approximately 1 mile south of N-12 in Niobrara near L' Eau Qui Court Cemetery (see Chapter 3.0, Existing Environment, Figure 3-1). The landfill was opened in the early 1970s to accept waste produced during Niobrara's move from its former location, at the confluence of the Missouri and Niobrara rivers, to its current location. During the move, the landfill accepted all wastes from Niobrara, including construction debris and household and industrial wastes. The landfill has since stopped accepting wastes from Niobrara and surrounding areas and now only accepts trees, branches, and other green wastes. Based on the description of the landfill/tree dump, this site is considered a high-risk site.

The 20 low-risk sites with RECs are summarized in Table C-5.

Table C-5
Sites with Recognized Environmental Conditions – Low Risk

Site Name	Database[1]
Lewis and Clark Lake	DOD
Greg's Motor and Marine	LUST – NFA;FINDS
Niobrara Trading Post	LUST – NFA;UST
Moody Motor Company	LUST – NFA;FINDS;UST
J and K Auto	LUST – NFA;FINDS;UST
Olson's School	LUST – NFA;FINDS;UST
Ed's Service and Supply	FINDS;UST
Niobrara Sand and Gravel	MINES
Verdigre CO-OP Association	FINDS
Niobrara Wastewater Treatment	NPDES;FINDS
Donald Knori	UST
Nebraska Department of Roads	LUST – NFA;FINDS;UST
Santee Sioux Indian Reservation	FINDS
Santee Hay Cubes	FINDS
Hunter's Haven	LUST – NFA
Roger Koehn Farm	LUST – NFA;SPILLS
Dew Drop Inn	LUST – NFA
Feather Hill Express	AST
Former Ohiya Casino & Bingo	S
Standing Bear Bridge	SPILLS

Note:
[1] *AST = Aboveground Storage Tank; DOD = Department of Defense; FINDS = Facility Index System/Facility Identification Initiative Program Summary Report; LUST – NFA = Leaking Underground Storage Tank – No Further Action; MINES = Mines Master Index File; NPDES = National Pollutant Discharge Elimination System permit; S = State Hazardous Waste Site; SPILLS = Spills Database; UST = Underground Storage Tank*

Source:
EDR. 2008. EDR DataMap™ Environmental Atlas™, N-12 Niobrara East and West, Knox, NE. Inquiry Number: 02239000.1r. August 8.

C.4.2 No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed and regulated materials sites would not be affected.

C.4.3 Action Alternatives

All of the Action Alternatives would include reconstruction of the existing N-12 roadway past the former Ohiya Casino & Bingo and Feather Hill Express site, but none of the Action Alternatives would impact the site. None of the Action Alternatives would impact the Niobrara Landfill site nor any of the other low risk sites.

There is a potential for asbestos-containing materials (ACM) or lead-based paint on existing bridges that would be removed under all Action Alternatives.

No indirect impacts were identified.

C.4.4 Avoidance, Minimization, and Mitigation

If contaminated soils and/or water or hazardous materials are encountered, then all work within the immediate area of the discovered hazardous material shall stop until NDOR is notified and a plan to dispose of the Hazardous Materials has been developed. Then the Nebraska Department of Environmental Quality (NDEQ) shall be consulted and a remediation plan shall be developed for this project. The potential exists to have contaminants present resulting from minor spillage during fueling and service associated with construction equipment. Should contamination be found on the project during construction, NDEQ shall be contacted for consultation and appropriate actions to be taken. The Contractor shall be required by NDOR's Standard Specification section 107 (legal relations and responsibilities to the public) to handle and dispose of contaminated material in accordance with applicable laws.

If the method of removal of bridges that contain lead-based pain generates paint debris, the waste shall be handled in accordance with NDOR's Standard Specification for Highway Construction Section 732 (Lead-based Paint Removal) and Title 128, Nebraska Hazardous Waste Regulations. The Contractor shall recycle any lead plates at a legitimate recycling facility as found in paragraph 3 (environmental requirements) in Section 203.01 of the Standard Specification for Highway Construction and in accordance with Title 128, Nebraska Hazardous Waste Regulations.

Prior to activities at the bridge sites, the structures shall be thoroughly inspected for the presence of ACM. All suspect ACM shall be sampled and laboratory analyzed or is assumed to contain asbestos and shall be handled as such. Suspect ACM associated with bridge structures may include, but is not limited to: utilities attached to the structure, joint compounds or sealers, and deck overlays. The inspector must be certified in accordance with the Nebraska DHHS Nebraska Asbestos Control Program Regulations, Title 178. A list of Licensed Asbestos Inspectors can be found at http://dhhs.ne.gov/publichealth/Documents/asbestosinspectors.pdf. Documentation of inspection shall be provided to the NDOR project manager by the contractor and shall be recorded in the Environmental Compliance Oversight Database (ECOD) system. If the bridge structure is comprised of only steel, concrete, brick or wood, an inspection by a certified inspector is not necessary.

If ACM is found to be present, removal and disposal of the ACM shall be in accordance with DHHS Nebraska Asbestos Control Program Regulations, Title 178, and shall occur prior to any bridge demolition or renovation activities. The contractor shall develop a removal and disposal plan in coordination with a licensed Asbestos Removal Contractor and NDOR. A list of Licensed Asbestos Removal Contractors can be found at http://dhhs.ne.gov/publichealth/Documents/asbestosbusinessentities.pdf.

C.5 AIR QUALITY

The Clean Air Act Amendments of 1990 and NEPA require that environmental documents address potential air quality impacts. However, the applicability and extent of the air quality analysis is based primarily on the status of the area studied with respect to federal and state air quality standards. A geographic area that meets the primary National Ambient Air Quality Standards (NAAQS) established by EPA to protect health and the environment is designated as an "attainment area." Primary standards are established to protect public health, and secondary standards are set to protect public welfare (EPA 2011a). A geographic area is designated as a "nonattainment area" if air pollution levels persistently exceed NAAQS for any of six principal pollutants: carbon monoxide

(CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (both PM10 and PM2.5), ozone (O_3), and sulfur dioxide (SO_2).

The climate of Knox County is characterized by warm summers, cold winters, and moderate amounts of rainfall. Prevailing winds are from the north/northwest from January to April and from the south/southeast from May to December (High Plains Regional Climate Center 2008). This climate, combined with the topography and land use in the area, helps minimize the likelihood for an exceedance of the NAAQS. Knox County is in attainment for all criteria pollutants; thus, no conformity determination is required for the Study Area (EPA 2015).

Transportation conformity rules apply in areas that are designated as "nonattainment" or have a maintenance plan for the transportation-related criteria pollutants; as listed in 40 CFR 93.102(b). Knox County is not designated as "nonattainment" and does not have a maintenance plan in effect for any criteria pollutants. Therefore, transportation conformity rules do not apply to the project.

C.5.1 No-Action Alternative

Under the No-Action Alternative, traffic volumes on roadways within the Study Area are expected to increase. However, the Study Area is expected to remain in attainment for all criteria pollutants.

C.5.2 Action Alternatives

Similar to the No-Action Alternative, traffic volumes are projected to increase slightly. None of the Action Alternatives are expected to significantly impact air quality, regardless of which Action Alternative is adopted. The moderate traffic volumes projected for all Action Alternatives, combined with very low population density and limited industrial activity in the area, minimize the potential for exceeding the NAAQS. No indirect effects were identified.

C.5.3 Avoidance, Minimization, and Mitigation

No avoidance, minimization or mitigation measures are proposed.

C.6 SOCIAL

The social characteristics addressed in this EIS include population, environmental justice, public services and facilities, utilities, and transportation. With regard to impacts on social characteristics, the affected area is the area in and around the Study Area. Statistics used for the analysis were sometimes based on a larger area (such as Knox County), but the evaluation of impacts was focused on the Study Area. The magnitude of projected change was evaluated and described for the social characteristics considered.

C.6.1 Population Existing Conditions

While Nebraska's population has steadily grown since 1970 through 2010, the populations of Knox County and the Village of Niobrara have decreased by 25.8 and 38.5 percent, respectively, from 1970 to 2010. The decline in the population of Knox County is a continuation of a trend since 1930 when Knox County reached its peak population of 19,110 (U.S. Census Bureau, March 1996). The Study Area is located in two Census tracts (9762 and 9764) within Knox County. The population of Census

Tract 9762 declined by 4.7 percent from 1990 to 2000 and declined by another 7.5 percent from 2000 to 2010. The population of Census Tract 9764 increased by 4.7 percent from 1990 to 2000, but declined by 5.6 percent from 2000 to 2010. Overall, the population of Census Tract 9764 decreased by 1.2 percent from 1990 to 2010. The population of Census blocks wholly or partially within the Study Area decreased by 16.3 percent from 1990 to 2000, but increased by 7.9 percent from 2000 to 2010. However, the 2010 population was 9.7 percent lower than the 1990 population. Table C-6 shows the population trends in the Study Area and the surrounding region over a 40-year period, based on available data. Figure C-2 shows the locations of the Census tracts and Census blocks.

What is census tract?

A Census tract is a small, relatively permanent statistical subdivision of a county. Census tracts are divided into block groups, which are further divided into blocks. Each census tract contains a minimum of one block group and may have a maximum of nine block groups (U.S. Census Bureau 2005).

What is a census block?

Census blocks are statistical areas within a census tract, bounded by visible features, such as streets, roads, streams, and railroad tracks, and by non-visible boundaries, such as selected property lines and city, township, school district, and county limits.

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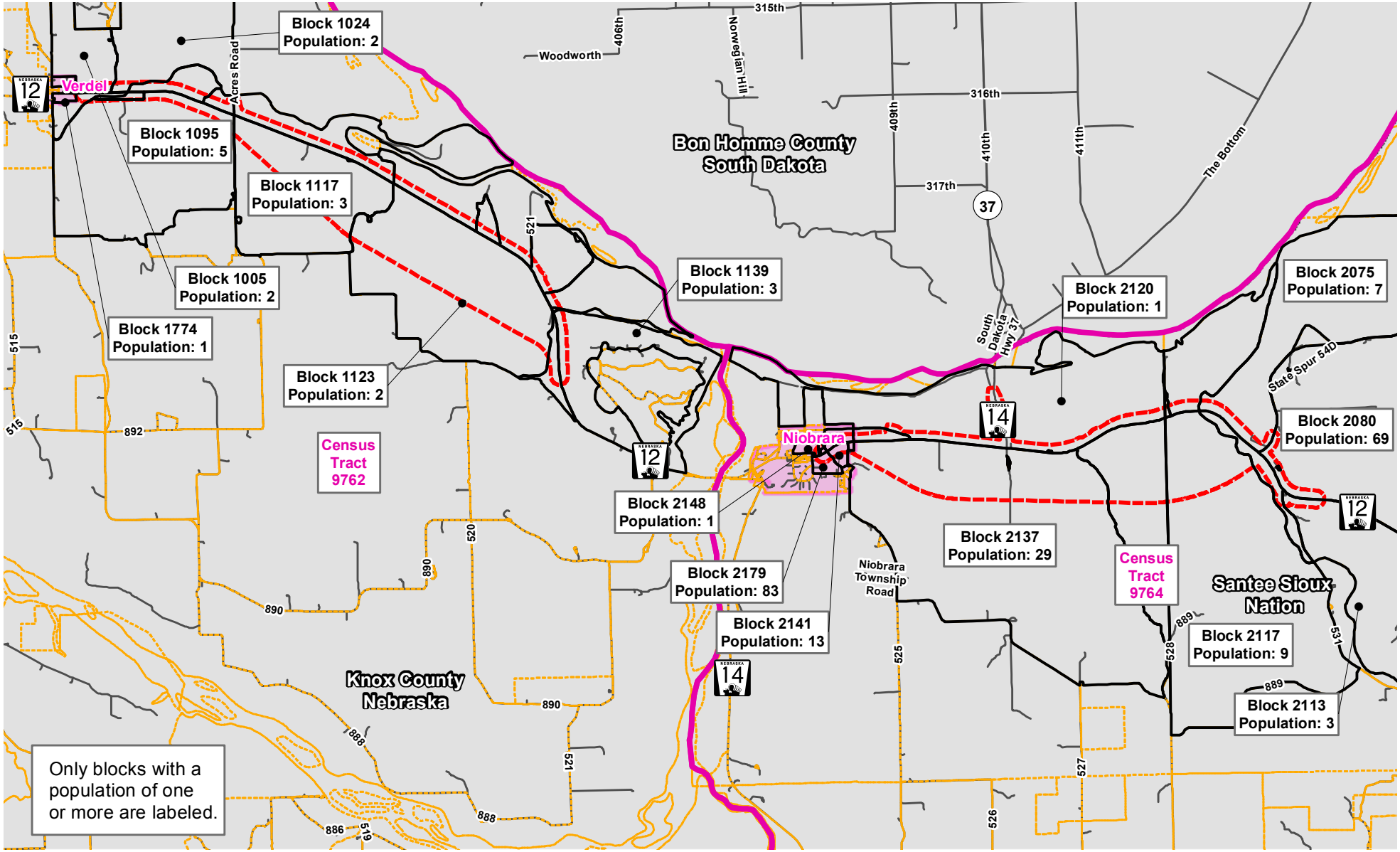

Legend

- Study Area 2010 Census Blocks
- Roads
- City Limits
- Study Area
- 2010 Census Tract
- 2010 Census Block

0 0.75 1.5 Miles

2010 Census Blocks Population

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

DATE
October 2015

FIGURE
C-2

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Table C-6
Population Trends (1970 to 2010)

Location	Decade					Population Change by Decade[1]			
	1970	1980	1990	2000	2010	1970-1980	1980-1990	1990-2000	2000-2010
Nebraska	1,485,333	1,569,825	1,578,417	1,711,263	1,826,341	84,492	8,592	132,846	115,078
Knox County	11,723	11,457	9,534	9,374	8,701	(266)	(1,923)	(160)	(673)
Village of Niobrara	602	419	406	379	370	(183)	(13)	(27)	(9)
Census Tract 9762	N/A	N/A	3,524	3,358	3,106	N/A	N/A	(166)	(252)
Block 1005	N/A	N/A	18	7	2	N/A	N/A	(11)	(5)
Block 1023	N/A	N/A	1	0	0	N/A	N/A	(1)	0
Block 1024	N/A	N/A	0	0	2	N/A	N/A	0	2
Block 1095	N/A	N/A	7	7	5	N/A	N/A	0	(2)
Block 1101	N/A	N/A	12	0	0	N/A	N/A	(12)	0
Block 1117	N/A	N/A	5	3	3	N/A	N/A	(2)	0
Block 1123	N/A	N/A	5	3	2	N/A	N/A	(2)	(1)
Block 1124	N/A	N/A	2	2	0	N/A	N/A	0	(2)
Block 1139	N/A	N/A	6	6	3	N/A	N/A	0	(3)
Block 1774	N/A	N/A	8	6	1	N/A	N/A	(2)	(5)
Census Tract 9764[2]	N/A	N/A	3,160	3,307	3,123	N/A	N/A	147	(184)
Block 2075	N/A	N/A	2	7	7	N/A	N/A	5	0
Block 2080	N/A	N/A	33	51	69	N/A	N/A	18	18
Block 2113	N/A	N/A	9	4	3	N/A	N/A	(5)	(1)
Block 2117	N/A	N/A	22	5	9	N/A	N/A	(17)	4
Block 2120	N/A	N/A	1	2	1	N/A	N/A	1	(1)
Block 2137	N/A	N/A	17	16	29	N/A	N/A	(1)	13

Location	Decade					Population Change by Decade[1]			
	1970	1980	1990	2000	2010	1970-1980	1980-1990	1990-2000	2000-2010
Block 2141	N/A	N/A	41	16	13	N/A	N/A	(25)	(3)
Block 2148	N/A	N/A	0	1	1	N/A	N/A	1	0
Block 2179	N/A	N/A	69	80	83	N/A	N/A	11	3
Study Area Blocks	N/A	N/A	258	216	233	N/A	N/A	(42)	17

Note:
[1] *Numbers in parentheses denote a negative change.*
2 *The 2010 Census Tract 9764 was identified as Census Tract 9761 in the 1990 and Census Tracts 9671 and 9761 in the 2000 Census.*

Sources:

Nebraska Department of Economic Development. 2009a. "County Populations, 1960 to 2008." March 19. Retrieved on January 15, 2010. http://www.neded.org/files/research/stathand/bsect4b.htm.

Nebraska Department of Economic Development. 2010a. "Population of Nebraska Incorporated Places, 1930 to 1980." January 13. Retrieved on January 15, 2010. http://www.neded.org/files/research/stathand/bsect5b.htm.

Nebraska Department of Economic Development. 2010b. "Population of Nebraska Incorporated Places, Nebraska - 1990 and 2000." January 13. Retrieved on January 15, 2010. http://www.neded.org/files/research/stathand/bsect5c.htm.

Nebraska Department of Economic Development. 2014a. "County Populations, 1960 to 2013, Nebraska – Census Years Plus 2013 Estimates." September 16. Retrieved on October 28, 2014. http://www.neded.org/files/research/stathand/bsect4b.htm.

Nebraska Department of Economic Development., 2014b. "Population of Nebraska Incorporated Places, Nebraska – 1990, 2000, 2010, 2012, and 2013. September 16. Retrieved on October 28, 2014. http://www.neded.org/files/research/stathand/bsect5c.htm.

U.S. Census Bureau, 2010. Table P 1, Total Population, Census tracts and blocks in Knox County. Accessed September 1, 2015. http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

U.S. Census Bureau, 2000. Table P 001, Total Population, Census tracts and blocks in Knox County. Accessed September 1, 2015. http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

U.S. Census Bureau, 1990. 1990 Census of Population and Housing Public Law 94-171 Data (Official) Census tracts and blocks in Knox County. Accessed September 1 and 2, 2015. http://censtats.census.gov/cgi-bin/pl94/pl94data.pl

From 2000 to 2030, the population of Knox County is projected to continue to decrease another 25 percent to 7,150 by the year 2030 (Nebraska Department of Economic Development 2009b).

No-Action Alternative

The No-Action Alternative would not affect the current decline in population of Knox County or Niobrara. The roadway would continue to deteriorate and would have more occurrences of flooding and temporary road closure. However, population decline cannot be linked to road maintenance frequency and temporary closures.

Action Alternatives

The Action Alternatives would not affect the current decline in population of Knox County or Niobrara. The Action Alternatives would improve east-west traffic flow along N-12 and would provide improved access between Nebraska and South Dakota.

The improved traffic flow may make Knox County and Niobrara a more attractive choice for potential residents as well as for additional commercial or recreational development. However, due to many other factors, it is speculative and unlikely that a new roadway would result in an increase in population.

C.6.2 Environmental Justice Existing Conditions

Environmental justice (EJ) addresses equity in all federally funded programs and activities in compliance with Title VI of the Civil Rights Act of 1964 (42 USC 2000d et seq.) and Executive Order 12898 (59 FR 7629). According to Title VI and Executive Order 12898, federal agencies must identify and address the possible disproportionately high and adverse environmental effects on minority, vulnerable age (below age 18 and above age 65), and low-income populations, referred to as EJ populations, before permitting or approving a program or activity that uses federal funds. In compliance with Title VI and Executive Order 12898, the socioeconomic composition of the Study Area was examined to identify concentrations of potential EJ populations as a starting point for identifying disproportionate impacts on these groups. In addition, specific types of impacts were examined with respect to their potential to disproportionately impact these social groups, regardless of where the impact might occur.

Potential EJ populations with respect to race, ethnicity, vulnerable age, and income were determined by absolute and relative population measures using county, block group, and block information from the 2010 Census. EJ populations were initially evaluated by comparing their percentage in the Study Area to the percentage in Knox County to determine if the number of EJ households in a given portion of the Study Area is high and/or disproportionately greater than the number in the surrounding region. Together, these thresholds represent a conservative measure of proportionality.

What is an absolute population?

"Absolute" pertains to areas in which greater than 50 percent of the population is an EJ population.

What is a relative population?

"Relative" pertains to areas in which the percentage of an EJ population is greater than the corresponding percentage in the city or county.

EJ populations have been identified in the two block groups located within the Study Area. The potential for disproportionate effects or significant adverse human health effects was evaluated for each alternative.

Environmental Justice Baseline Conditions

Table C-7 lists the percentages of racial minorities, ethnic minorities, vulnerable age populations, and households below the poverty level in Knox County utilizing the most current data set of comprehensive statistics).

Table C-7
Environmental Justice Baselines

Jurisdiction	Total Population	Minorities (%)	Population Under 18 Years of Age (%)	Population Over 65 Years of Age (%)	Individuals Below Poverty Level (%)
Knox County, NE	8,701	10.4	24.1	22.7	14.0

Sources:
U.S. Census Bureau. 2010. 2010 Census Lookup. http://factfinder.census.gov.
U.S. Census Bureau. 2013. "American Fact Finder. 2009-2013 Community Survey 5-Year Estimates." http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml. (used for only individuals below poverty level)

The Study Area is located within two census tracts. The west segment is in Census Tract 9762, and the east segment is in Census Tract 9674, as shown in Figure C-2, Census Tracts, located at the end of this appendix. The Study Area is within block group 1 of census tract 9762 and block group 2 of census track 9674, which is written as 9762-1 and 9674-2, respectively.

What is a block group?

Block groups provide a geographic summary unit for census block data (U.S. Census Bureau 2005).

Minority Populations

As detailed in Table C-8, three census blocks within the Study Area contain racial minorities in exceedance of determined significance thresholds that constitute a potential EJ population. Significance thresholds were determined as 140 percent of those populations in Knox County (1.4 times the Knox County percentage of racial minority). A 40 percent threshold represents a rounded value that is approximately the population within one standard deviation (34 percent) greater than the mean (average value) of a typical normal data distribution curve. Standard deviation measures the amount of variation or dispersion of a set of data values.[1] Significance thresholds were determined to be 14.5 percent for racial minorities. The majority of those individuals making up the racial minority populations indicate "American Indian and Alaska Native alone" as their race. All potentially significant racial minority populations occur in the east segment of the Study Area in Block Group 9674-2, as shown in Figure C-3.

[1] Typically 68 percent of data values in a set of data are within one standard deviation of the mean (average) value of the data set (34 percent within one standard deviation above the mean and 34 percent within one standard deviation below the mean).

Table C-8
Minority Populations

Area	Racial Minorities	
	Percent	Number of Individuals
Nebraska	16.2	296,046
Knox County	10.4	902
2075	71.4	5
2080	88.4	61
2120	100	1

Source:
U.S. Census Bureau. 2010. 2010 Census Lookup. http://factfinder.census.gov.
Note:
Due to the large number of blocks in the Study Area, only blocks with a minority population are shown.

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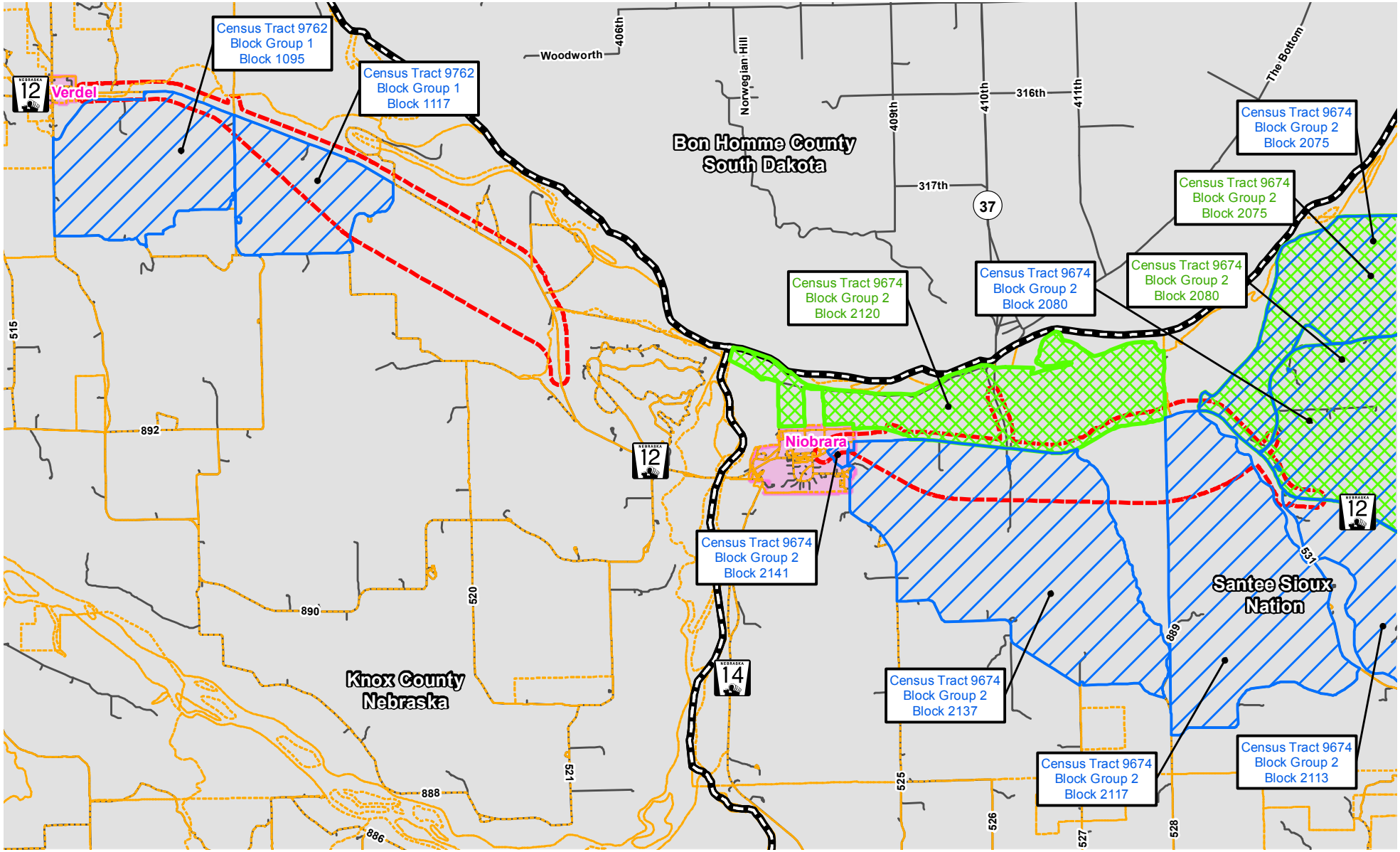

Legend

- Roads
- City Limits
- Study Area
- 2010 Census Tract
- 2010 Census Block Group
- 2010 Census Block
- Vulnerable Age
- Racial Minorities

0 0.75 1.5
Miles

Census Blocks with Meaningfully Greater Racial Minorities & Vulnerable Age Populations

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

DATE
October 2015

FIGURE
C-3

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Vulnerable Age Populations

As detailed in Table C-9, eight census blocks within the Study Area contain vulnerable age populations in exceedance of the determined significance thresholds established to constitute a potential EJ population. Significance thresholds were determined as 140 percent of those populations in Knox County (1.4 times the Knox County percentage of persons less than 18 years of age or persons greater than 65 years of age). Significance thresholds were determined to be 33.74 percent for persons less than 18 years of age and 31.78 percent for persons greater than 65 years of age. Potentially significant vulnerable age populations occur in both the west and east segments of the Study Area, as shown in Figure C-3.

Table C-9
Vulnerable Age Populations

Area		< 18 Years of Age		> 65 Years of Age	
		Percent	Number of Individuals	Percent	Number of Individuals
Nebraska		13.5	246,677	25.1	459,221
Knox County		24.1	2,096	22.8	1,979
Census Tract-Block Group	Block				
9762-1	1095	--	--	40.0	2
	1117	--	--	33.3	1
9764-2	2075	42.9	3	--	--
	2080	43.5	30	--	--
	2113	--	--	66.7	2
	2117	55.6	5	--	--
	2137	--	--	37.9	11
	2141	--	--	46.2	--

Source:
U.S. Census Bureau. 2010. 2010 Census Lookup. http://factfinder.census.gov.

Low-Income Populations

Within the Study Area, Block Group 9674-2 contained a percentage of individuals in poverty greater than the established significance criteria and would be considered to include a low-income EJ population. In this block group, 30 percent of the households were below the poverty level in 2010. This is compared to the significance threshold of 19.6 percent, which was determined as 140 percent of the individuals in poverty in Knox County (1.4 times the percentage of individuals in poverty in Knox County). Based on recent U.S. Census data, Block Group 9762-1 does not include a low-income EJ population.

Table C-10
Low-Income Populations

Area	Low-Income Population	
	Percent	Number of Individuals
Nebraska	12.8	228,789
Knox County	14.0	1,171
Census Track – Block Group 9762-1	6.9	81
Census Track – Block Group 9764-2	30.0	416

Source:
American Community Survey, 2014. 2009-2013Ratio of Income to Poverty Level.
http://factfinder.census.gov.

No-Action Alternative

The No-Action Alternative likely would neither benefit nor harm racial and ethnic minority, vulnerable age, or low-income populations.

Action Alternatives

All Action Alternatives have corridors within census block groups that contain racial minorities, vulnerable age groups, and low-income populations. However, though some populations exceed significance thresholds (as expected on the Santee Sioux Reservation, for example), the actual number of individuals is so small that no significant impacts exist. For example, for minority populations, all minorities total 67 individuals. A statistical comparison based on a small sample size yields results that can be misleading. Therefore, none of the Action Alternatives would have a disproportionate and adverse effect on EJ populations.

The potential for a slight increase in economic activity as well as the improved reliability of N-12 could have a minor indirect benefit for EJ populations.

C.6.3 Public Services and Facilities Existing Conditions

Public services in the Study Area include law enforcement, fire protection, and ambulance service providers. Public services in the area surrounding Niobrara include the Niobrara Fire and Rescue volunteer unit, with ambulance and 911 service. The Niobrara Police Department and the Knox County Sheriff (located in Center, Nebraska) serve the communities within the Study Area. The Santee Sioux Nation maintains a police department as well. The Nebraska State Patrol assigns one trooper to work in Knox County. Verdigre and Santee as well as Springfield, South Dakota, all have medical clinics and emergency responders but are about 30 minutes from Niobrara.

Public facilities in the Study Area are listed in Table C-10. These facilities include two medical clinics, a public elementary school, a public junior/senior high school, four places of worship, a library, and two museums.

Table C-10
Public Facilities in the Study Area

Type of Facility	Name	Address
Medical	Avera Sacred Heart Medical Clinic of Niobrara	254-10 Park Avenue, Niobrara, NE 68760
Medical	Ponca Tribe of Nebraska Health and Wellness Center	North Spruce Avenue, Niobrara, NE 68760
Education	Niobrara Elementary School	247 N Highway 12, Niobrara, NE 68760
Education	Niobrara Junior and Senior High School	247 N Highway 12, Niobrara, NE 68760
Place of Worship	St. Williams Catholic Church	211 4th Avenue, Niobrara, NE 68760
Place of Worship	Niobrara Assembly of God[1]	253-4 Apple Street, Niobrara, NE 68760
Place of Worship	Niobrara Evangelical Lutheran Church	Apple Street, Niobrara, NE 68760
Church	Niobrara Presbyterian Church	Apple Street, Niobrara, NE 68760
Library	Niobrara Public Library	25414 Park Ave # 3, Niobrara, NE 68760
Museum	Ponca Tribal Museum	2548 Park Avenue, Niobrara, NE 68760
Museum	Niobrara Museum	2548 Park Avenue, Niobrara, NE 68760

Note:
[1] *Church deconsecrated in 2009.*
Source:
Village of Niobrara. 2003. "Welcome to Niobrara, Nebraska." Retrieved on November 17, 2008. http://www.niobrarane.com/.

Niobrara Public Schools serve approximately 150 students over 150 square miles with their school bus service. There are significant numbers of Santee Sioux and Ponca students receiving their education at Niobrara Public Schools. A higher proportion of students are eligible for free and reduced price meals and are receiving special education compared to the rest of the State, yet the district scores are exemplary or very good in reading and math standards (Nebraska Department of Education 2014).

No institutes of higher learning are located within the Study Area. The closest colleges occur in Santee (Nebraska Indian Community College); Sioux City, Iowa; Wayne, Nebraska; Norfolk, Nebraska; Yankton, South Dakota; and Vermillion, South Dakota.

No hospitals are located in the Study Area; the closest hospitals are found in Lynch, Nebraska; Creighton, Nebraska; Tyndall, South Dakota; and Yankton, South Dakota, all of which are 30 minutes to an hour and 20 minutes from Niobrara.

No large-scale wastewater or drinking water treatment facilities are located within the Study Area. Rural wastewater treatment is handled privately by use of septic tanks and lagoons. Rural irrigation and drinking water in the Study Area are provided by registered wells. According to the Nebraska Department of Natural Resources (Nebraska DNR), Knox County currently has 1,437 registered wells, of which 6 are commercial, 340 are domestic, 534 are used for irrigation, 268 are monitoring wells, and 289 have a variety of additional designations (Nebraska DNR 2009). There are 10 registered wells within the Study Area. Based on the locational data available, none are within the permanent area of impact of any of the Action Alternatives.

There are no wastewater treatment facilities located within the Study Area. Niobrara's wastewater treatment plant is located north of Niobrara, within the floodplain adjacent to the Missouri River. This treatment facility consists of a lagoon system. The Village of Niobrara maintains this facility,

and it is regularly monitored by EPA (Village of Niobrara 2009). Because it is not within the Study Area, this facility would not be discussed further.

There are no potable water treatment facilities located within the Study Area. The Village of Niobrara maintains two wells located on the Niobrara River bottom and has no treatment facility for this water. In addition, the Village maintains an elevated 250,000-gallon storage tank and provides non-potable water to commercial and residential buildings via approximately 225 connections (Village of Niobrara 2009).

No-Action Alternative

The No-Action Alternative may negatively affect public facilities. This affect is based on the time of travel for residents in and around the Study Area that rely on N-12 to travel to the medical clinics, schools, places of worship, library, and museums in Niobrara. Under the No-Action Alternative, when the roadway is flooded (or being repaired from flooding), increased travel times to reach Niobrara, where the public facilities are located, would be expected. However, access to these facilities from within or adjacent to the Study Area would not be eliminated, even during road closures, as alternative county roads exist that allow access to Niobrara for residents in and around the Study Area (access to Chief Standing Bear Memorial Bridge could be eliminated pending flood events east of Niobrara).

In addition, the No-Action Alternative may adversely impact emergency service provider response times due to flooding and roadway repair. Response times would not be affected for residents in Niobrara, Niobrara State Park, or areas south of Niobrara accessed via N-14. Access from responders originating in Niobrara to Lazy River Acres and other residents in or near the Study Area west of Niobrara could be accessed by utilizing existing county roads. Response times would be longer using the county road network than if using N-12. Alternatively, residents in and around the Study Area in the west segment could be accessed from responders in Verdel (pending flood events from Ponca Creek). In the event of a road closure west of the junction of N-14 and N-12 (the Chief Standing Bear Memorial Bridge approach), residents near the N-14 and N-12 intersection could be accessed from responders in Springfield, SD. Residents east of the N-14 and N-12 intersection, including access to State Spur 54-D, could be accessed from county roads. Emergency response times may be compromised because the affected roadway would be unable to facilitate timely emergency services.

Action Alternatives

The Action Alternatives would benefit public facilities by providing a safe and reliable roadway along N-12. Residents in and around the Study Area would be better able to access public facilities in Niobrara. All of the Action Alternatives would create a reliable roadway. The Action Alternatives would likely improve emergency response times compared to existing conditions by providing a reliable roadway, wider driving lanes, and wider shoulders that allow vehicles to pull to the side of the road while emergency vehicles pass. With the exception of Alternative A1, the Action Alternatives allow the existing roadway to stay in place to provide access to the traveling public during construction. Under Alternative A1, traffic would be maintained on a temporary roadway during construction. While there would likely be some speed restrictions, or temporary interruption due to equipment crossing or using the road, emergency responders would be able to maintain normal response times.

The improvement in the reliability of N-12 would result in an indirect benefit to people needing emergency services as well as those using school busses to travel to school.

None of the Action Alternatives would affect public or private water supply or treatment.

C.6.4 Utilities Existing Conditions

The potential of the project to affect utilities in the Study Area (as defined in Figure 3-1 in Chapter 3) was considered by identifying these resources. The following utility companies and municipalities provide service to the Study Area (Nebraska Public Power District 2010):

- North Central Public Power District – electrical service to Niobrara, Verdigre, and Santee
- Niobrara Valley Electric – electrical service to northwest Knox County
- Great Plains Communications, Inc. – communication services (telephone, cable television, and internet) in Niobrara and eastward
- Three River Telco – communication services to Verdel
- N&B Gas Company – natural gas
- J&J Sanitation – sanitation services and sewer
- Village of Niobrara – well water to Niobrara residents
- West Knox Rural Water System – water to Verdigre and rural customers

There are several utilities located in the Study Area:

- North Central Public Power District – power lines
- Niobrara Valley Electric – power lines
- Great Plains Communications, Inc. – fiber optic lines (telephone, cable television, and internet)
- Three River Telco – fiber optic lines
- West Knox Rural Water System – water line

No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed and no utility impacts would occur.

Action Alternatives

Impacts on utilities (such as low-voltage distribution lines or fiber optic cable) may not be avoidable because several utilities are located near or sometimes within the existing N-12 ROW. Under the Action Alternatives, when NDOR would relinquish the ROW no longer needed, the utilities may purchase an easement on the property or relocate to new NDOR ROW. Utilities may also need to re-route lines to other access points. No indirect impacts on utilities were identified.

C.6.5 Transportation Existing Conditions

As described in Chapter 1.0, Purpose of and Need for the Project, N-12 is an east-west two-lane highway in northeastern Nebraska that provides a route for local residents and through traffic. N-12 provides a vital travel link for adjacent rural residents and for traffic traveling north-south and east-west through northeastern Nebraska.

Rural residents and/or private landowners use N-12 to access their land adjacent to the Missouri River. Travelers use N-12 to access many state recreation areas, wildlife management areas, boat launches, and scenic overlooks. In addition, the Nebraska Department of Economic Development, Division of Travel & Tourism markets N-12 as an alternate scenic route to the Black Hills of South Dakota. N-12 connects the Study Area to major north-south highways (N-14, SD-37 [across Chief Standing Bear Memorial Bridge], and U.S. Highway 81) and eventually connects to Interstate 29 in South Sioux City, Nebraska. N-12 also connects to S-54D east of Niobrara, an important connection to Santee. Residents of Santee use S-54D and N-12 to access Niobrara and other towns in the region.

No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed. Continued flooding and ongoing roadway repair may negatively impact transportation in this region. N-12 currently has an 8-foot 6-inch vehicle width restriction that requires an escort vehicle for wider widths.

Action Alternatives

All Action Alternatives would provide a safe and reliable roadway and would improve through traffic. In addition, all Action Alternatives would provide direct access to Niobrara, would maintain access to N-14 and Standing Bear Bridge, and would maintain a connection to S-54D. The Action Alternatives are on alignments similar to the existing roadway and would not affect travel patterns. All Action Alternatives would require the acquisition of additional ROW. If landowner access to a property could not be maintained, the property may be acquired (see Section 4.11, Acquisitions and Relocations).

Effects on public services are discussed in Section C.6.7.

Providing a reliable N-12 roadway would have a benefit on emergency services, school bus transportation, and the traveling public.

C.6.6 Avoidance, Minimization, and Mitigation

In regard to utility impacts, NDOR's standard specification 105.06 (NDOR 2007) states:

> The Department will notify all utility companies, pipeline owners, railroads or other parties affected by the work and endeavor to have all necessary adjustments of the public or private utility fixtures, pipelines, and other facilities within or adjacent to the limits of construction made as soon as practicable.
>
> Water lines, gas lines, wire lines, service connections, water and gas valve boxes, light standards, cableways, signals and all other utility facilities within the limits of

> the proposed construction are to be moved by the owners at no expense to the Contractor, except as otherwise provided for in the special provisions or as noted in the plans.

Specific mitigation to minimize disruption of service on the pipelines, water lines, transmission lines, and other utility lines would be determined during the design and construction phases of the project.

No mitigation with respect to other social impacts is proposed.

C.7 ECONOMICS

What is the region of economic influence?

The region of economic influence includes Antelope, Boyd, Cedar, Holt, Knox, and Pierce counties in Nebraska and Bon Homme and Charles Mix counties in South Dakota.

The economic impacts of major transportation projects typically extend beyond the area immediately adjacent to the proposed project. Rather, economic impacts generally occur over a larger area based on the distribution of goods and services and the availability of labor and expertise in the immediate area. This larger area is defined as the region of economic influence, which for this project includes Antelope, Boyd, Cedar, Holt, Knox, and Pierce counties in Nebraska and Bon Homme and Charles Mix counties in South Dakota. The following sections provide detailed business and access, income and employment, and tax base data for the eight counties that make up the region of economic influence for this project.

Economics was evaluated by identifying direct and indirect impacts of the alternatives, including economic benefits extending to the region of economic influence. The effects associated with the alternatives are described to the degree possible and include the following:

- Impacts on existing businesses
- Fiscal impacts of ROW acquisition
- Regional benefits of an improved transportation system

Impacts on local business during construction and regional economic benefits due to construction are addressed in Section 4.14.

C.7.1 Businesses and Access Existing Conditions

N-12 provides access to several types of businesses, both at a local level and at a regional level.

Local

The few commercial businesses within the Study Area are primarily near the intersection with Spur 54-D. Commercial business near the Study Area (not including those in Niobrara) are located near the Lazy River Acres development and Verdel west of Niobrara and Ohiya Casino & Resort located east of Niobrara and the Study Area, as shown in Chapter 3.0, Existing Environment, Figure 3-1.

To determine impacts on local economies, generalizations regarding business impacts were made by dividing the affected businesses into two categories:

- Impulse – Businesses with a high percentage of impulse-oriented customers are those providing a type of service or product offered at one or more alternative sites, such as a convenience store. Impulse businesses benefit from high volumes of drive-by traffic and are the most likely to be affected by road construction and closure. In the Study Area, impulse businesses are primarily located adjacent to N-12.
- Destination – Businesses with a high percentage of destination-oriented customers are those that have regular customers who are intent on stopping at a specific, specialized business. Examples are a tire store or a bank. Destination businesses traditionally suffer the fewest impacts from road construction or closure. In the Study Area, destination businesses are located in Niobrara and in scattered locations along N-12.

Niobrara has a variety of businesses to serve the residents of the community and surrounding area as well as businesses with a focus on tourism. Businesses in Niobrara include automobile dealers, a grocery store, banks, a medical clinic, a hardware store, gas stations, cafes, and motels or bed and breakfasts. Many of these businesses are used by destination-oriented customers, but they do benefit from impulse-oriented customers, especially during tourist or hunting season.

The Lazy River Acres development is located near the Verdel Landing WMA. The businesses in this area cater to residents and visitors and include a campground, resort, bait shop, and restaurant. The businesses in this area are used by destination-oriented customers given their distance from N-12. Verdel has one restaurant and tavern, the Dew Drop Inn.

The Santee Sioux Nation maintains several establishments on the Santee Sioux Reservation that are related to the administration of services within the Reservation (health, education, and tribal government) or the provision of services. In January 2013, the Santee opened the expanded Ohiya Casino & Resort located 7 miles east of Niobrara, replacing the former Ohiya Casino & Bingo, located near the intersection with Spur 54-D. The former Ohiya Casino & Bingo now contains a commercial development and recreational vehicle campground facility.

The Ohiya Casino & Resort in its current location is a 25,000 square foot casino that offers 400 Class II gaming machines and the 61,000 square foot facility offers a 47-room lodge, a banquet facility, a conference center, an indoor swimming pool, and a neighboring gas station and convenience store. The Ohiya Casino & Resort employs 90 people. A golf course is slated for opening in 2015 (Dockendorf 2014). Ohiya Casino & Resort can be considered a destination business, but it does benefit from impulse traffic along N-12.

The Ponca Tribe of Nebraska is an important part of the Niobrara economy. The Ponca Tribe maintains administrative offices, the Ponca Tribe of Nebraska Health and Wellness Center, and the Ponca Tribal Museum in Niobrara.

Regional

On a regional level, N-12 connects to U.S. Highways 81 and 281, N-14, and SD-37. The area is rural in nature, dominated by an agricultural economy with numerous recreational opportunities. Bordering counties to Knox County include Cedar to the east, Pierce and Antelope to the south, Holt and Boyd to the west and Bon Homme and Charles Mix in South Dakota to the north. Knox County has several metropolitan areas within driving distance—Yankton, South Dakota, to the northeast; Sioux City, Iowa, to the east; and Norfolk, Nebraska, to the southeast. Towns in Nebraska within a

30-mile radius of Niobrara include (2013 population estimate [Nebraska Department of Economic Development 2014b]):

- Verdel (population: 30)
- Lynch (population: 236)
- Verdigre (population: 561)
- Creighton (population: 1,120)
- Center (population: 93)
- Santee (population: 348)

Towns in South Dakota within a 30-mile radius of Niobrara include (2010 population [U.S. Census Bureau 2010]):

- Tyndall (population: 1,067)
- Avon (population: 590)
- Springfield (population: 1,989)

No-Action Alternative

The No-Action Alternative could have a negligible impact on local and regional businesses and access because of potential road closures during flooding. Destination businesses in Niobrara and adjacent to the Study Area would be minimally affected. Access to those businesses would not be eliminated during flooding of N-12, but other routes, such as county roads, are needed to reach these destinations. Impulse-businesses, such as convenience stores, may be affected because drive-by traffic could be reduced during closures of N-12. Travelers for which Niobrara is not a destination may elect to use alternative routes to N-12 during road closures, thus removing the potential for these travelers to patronize impulse businesses.

Regional businesses would be minimally affected by N-12 road closures. Regional businesses that use N-12 as a transportation corridor may need to chose other, longer travel routes to deliver goods during N-12 road closures.

Currently, N-12 has a width limit restriction of 9 feet from Dakota Avenue in Verdel to S-54D. While there are no restrictions regarding the use of existing N-12 for oversized loads, additional costs to local and regional businesses may occur due to the need for oversized loads to use a pilot car. Specific areas that are signed for width restrictions and pilot car needs are (Nebraska 511 Traveler Information, August 2015):

- RP 155.95 to 156.97 (signed at 5,800 feet)
- RP 163.01 to 163.75 (signed at 3,800 feet)
- RP 164.56 to 165.52 (signed at 5,300 feet)

Action Alternatives

None of the Action Alternatives would have a direct impact on the businesses in Niobrara; all Action Alternatives would maintain access to Niobrara and its businesses. Niobrara would continue to be a

destination for residents of the community and the surrounding area. An improved roadway may have a positive indirect affect on tourism in the area as both residents and visitors would have a safe and reliable roadway on which to travel.

The businesses associated with the Lazy River Acres development cater to those residents and visitors who own property in the area or use the Verdel Landing access. All Action Alternatives would maintain access to Lazy River Road and would have no direct effect on those businesses.

All of the Action Alternatives would maintain access to Ohiya Casino & Resort, east of the Study Area. To the extent that a reliable N-12 might increase population or tourism, it would have an indirect benefit on some businesses.

C.7.2 Income and Employment Existing Conditions

Income characteristics, shown in Table C-11, indicate that the 2013 median household income of Niobrara was lower than other state and county benchmarks.

Table C-11
Median Household Income (2009-2013)

Area	Median Household Income
State	
Nebraska	$51,672
South Dakota	$49,495
County	
Antelope County, NE	$43,518
Boyd County, NE	$41,279
Cedar County, NE	$48,038
Holt County, NE	$44,427
Knox County, NE	$42,230
Pierce County, NE	$51,924
Bon Homme County, SD	$40,980
Charles Mix County, SD	$40,102
Community	
Village of Niobrara	$31,250

Source:
U.S. Census Bureau. 2013. American Fact Finder. 2009-2013 Community Survey 5-Year Estimates. http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

From 1990 to 2013, Nebraska experienced an 18.5 percent job growth, while Knox County experienced a 2.6 percent job growth, as shown in Table C-12. The counties surrounding Knox County experienced between -14.6 and 9.4 percent job growth. During that same time, Niobrara experienced a 11.9 percent job growth.

Table C-12
Employment Trends (Number of Employed Individuals)

Area	1990	2000	2013	Employment Change 1990-2013	Percent Employment Change 1990-2013
State					
Nebraska	772,813	877,237	948,701	175,888	18.5%
County					
Antelope County, NE	3,258	3,690	3,317	59	1.8%
Boyd County, NE	1,108	1,164	967	(141)	(14.6%)
Cedar County, NE	4,485	4,615	4,508	23	0.5%
Holt County, NE	5,754	5,708	5,642	(112)	(2.0%)
Knox County, NE	4,104	4,374	4,215	111	2.6%
Pierce County, NE	3,440	3,916	3,748	308	8.2%
Bon Homme County, SD	2,866	3,088	2,861	(5)	0.2%
Charles Mix County, SD	3,532	3,656	3,898	366	9.4%
Community					
Village of Niobrara	148	149	168	20	11.9%

Sources:
U.S. Census Bureau. 1990. "1990 Census Lookup." http://factfinder.census.gov.
U.S. Census Bureau. 2000. "2000 Census Lookup." http://factfinder.census.gov.
U.S. Census Bureau. 2013. "American Fact Finder. 2009-2013 Community Survey 5-Year Estimates." http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

In Knox County and adjacent counties, individuals are employed in a variety of employment sectors. Knox County's top five employment sectors in their rank order are (U.S. Census Bureau 2013):

1. Agriculture, forestry, fishing, and hunting
2. Health care and social assistance
3. Retail trade
4. Educational services
5. Construction

The counties adjacent to Knox County have similar top five employment sectors.

In Niobrara, the largest employers include Moody Motor, Trustworthy Hardware, Farmers and Merchants State Bank, J&K Auto, Niobrara State Park, Jones Cellular One Communications, Ponca Tribe government, Village of Niobrara government, Niobrara Public Schools, and Farnik's Grocery Store (Nebraska Public Power District 2012).

No-Action Alternative

The No-Action Alternative could have a negative effect on employment as the top employment sectors in Knox County and the largest employers in Niobrara rely on safe and reliable transportation routes. If N-12 is unreliable, it may impact the ability of an employee to get to and from work, a school to safely transport students, a farmer to get to and from his fields, and a recreationist to get to and from his recreation spot. An unreliable N-12 could hinder the delivery of goods and services to and from Niobrara. Regional business that use N-12 as a transportation corridor may need to chose

other, longer travel routes during N-12 road closures. An indirect effect of the lack of access for recreationists is their reduced use of Niobrara facilities and business.

Action Alternatives

Impacts on the area's economy would be relatively minor. The largest employers in Niobrara would not be impacted because no construction is occurring within Niobrara.

The Action Alternatives are not anticipated to substantially impact any of the top five employment sectors in Knox County, but there would be some minor effects. These Action Alternatives would remove between 19 and 301 acres of agriculture and rangeland from production. There would be a minor indirect adverse impact on income due to loss of production on that agricultural land. There is potential for an indirect beneficial effect if a reliable N-12 results in an increase in population or tourism. There would be a temporary beneficial effect on the construction industry. The operation and maintenance of the roadway would not have a significant effect on socioeconomic resources.

C.7.3 Tax Base Existing Conditions

In July 2014, Knox County's non-vehicle net taxable sales were up 9.7 percent from July 2013 ($4,145,284 from $3,778,865) (Nebraska Department of Revenue 2014a). Total dollars wagered on charitable gaming activities in Knox County were less in 2014 than 2013. In Knox County, gross wagering increased in bingo, lottery and raffle; but decreased in pickle cards and keno (Nebraska Department of Revenue 2014b).

Property values in Knox County have steadily risen by 10.69 percent per year from 2003 to 2013, and property taxes have risen by 7.60 percent annually (Nebraska Department of Revenue 2014c). More recently, between 2012 and 2013, Knox County property values increased by 26.33 percent, with taxes increasing by 10.53 percent (Nebraska Department of Revenue 2014c).

Knox County has 652,219 acres of taxable agricultural land, which supply 67.54 percent of the property tax income, with residential properties providing 20.81 percent of the property tax income. (Nebraska Department of Revenue 2014d). In addition to taxable land, Knox County also has 1,200 parcels (25,088 acres) of tax exempt land (Nebraska Department of Revenue 2014d).

No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed. The No-Action Alternative would have no effect on the local tax base.

Action Alternatives

The project could affect two components of the local tax base: sales tax and property tax. None of the Action Alternatives would displace any businesses; therefore, they would not decrease sales tax revenues. All of the Action Alternatives would require ROW, removing that land from the tax base, causing local jurisdictions to lose a small portion of their property tax revenues.

Alternative A1, Existing Alignment, would remove the least amount of privately held lands from the tax base because the roadway would be constructed on existing ROW. In addition, the Action Alternatives would remove between 62 and 402 acres of privately held land from the tax base because

much of the land in the Missouri River floodplain is owned by the state and federal governments. The impacts of each Action Alternative on privately held land are shown in Table C-13.

Table C-13
Impacts on Privately Held Land by Alternative

Alternative	Privately Held Land Impacted (acres)	
	West Segment	East Segment
A1	32.43	29.70
A2	59.30	50.81
A3	108.17	73.24
A7	101.37	73.04

The majority of the privately held land impacted would be agricultural and rangeland. Based on the 2014 value of agricultural land in Knox County ($1,147,475,650) and the total taxable agricultural land (652,219 acres), the average value of agricultural land in Knox County is approximately $1,759/acre. Considering the 2014 tax rate for agricultural land (1.27), Alternative A1 would least impact the tax revenue for Knox County ($1,388) and Alternative A3 would have the greatest impact on tax revenue ($4,053). Given that the total tax revenue for the County is approximately $1.6 million, development of the project would not significantly impact the tax revenue of Knox County (Nebraska Department of Revenue 2014e).

To the extent that a reliable N-12 roadway might result in improved economic conditions, there would be a minor indirect benefit to the tax base.

C.7.4 Avoidance, Minimization, and Mitigation

Because no significant adverse economic impacts are anticipated, no mitigation with respect to economic impacts is proposed.

C.8 ENERGY

The principal factor in energy use is vehicle fuel consumption, which is affected by total miles traveled, the number of stops and starts, sudden acceleration or deceleration, congestion, and grade steepness. Energy use during construction would also include the use of construction vehicles, the transport of construction materials to and from the construction site, and the processing of raw materials.

C.8.1 No-Action Alternative

Under the No-Action Alternative, the existing roadway would remain the same, which would result in an unreliable roadway due to flooding and safety concerns. Currently, energy use is in the form of vehicle fuel consumption on the existing N-12 roadway. The energy use would remain the same, but in some cases, additional fuel consumption would be required to detour around flooding.

C.8.2 Action Alternatives

In the short-term, each Action Alternative would consume energy during the use of construction vehicles and the processing of raw materials for use in construction. Subsequent to construction, energy use would be in the form of vehicle fuel consumption. Because total miles traveled affects fuel consumption, the lengths of the Action Alternatives carried forward for analysis are provided in Table C-14.

Table C-14
Lengths of Action Alternatives

Alternative	West Segment Length (miles)	East Segment Length (miles)	Total Length (miles)
Alternative A1	6.2	6.0	12.2
Alternative A2	6.2	6.0	12.2
Alternative A3	6.1	6.0	12.1
Alternative A7	6.1	6.0	12.1

Action Alternatives with a shorter distance would require less fuel consumption; therefore, Alternatives A3 and A7 would require the least fuel consumption. However, the differences in fuel consumption among the Action Alternatives would be minimal. In addition, all of the Action Alternatives would be comparable to the No-Action Alternative for direct impacts. Under the No-Action Alternative, the west segment is approximately 6.4 miles long and the east segment is approximately 6 miles long. Therefore, the fuel consumption is comparable due to the lengths of the alternatives. Furthermore, under all of the Action Alternatives, traffic would improve conditions during flooding by avoiding detours and additional fuel consumption. The maximum road grade for all of the Action Alternatives is 4 percent, and all of the alternatives are located in the floodplain so there would be no discernable difference in fuel consumption based on road grade.

Road maintenance would vary amongst the Action Alternatives; therefore, the energy consumed would also differ. Alternative A3 would require additional traction control because the alignment is located along the bluffs, which would shade the roadway and not allow ice to melt as quickly. Alternative A7 includes 1.8 miles of bridges that would require additional road maintenance, such as additional traction control during the winter and bridge inspections. Therefore, Alternatives A3 and A7 would require additional energy consumption during road maintenance.

C.8.3 Avoidance, Minimization, Mitigation

Avoidance of energy consumption is not feasible. All of the Action Alternatives would require energy to be constructed. Energy use can be minimized during construction through best engineering practices such as reduction in travel distance to borrow and waste sites and strategic placement of staging areas to reduce on-site related construction trips.

Fuel consumption avoidance and minimization of vehicular use after construction is also not feasible.

No mitigation for energy consumption is proposed.

C.9 CLIMATE CHANGE

There is a growing concern about climate change and the impact it would have on living organisms and the environment. Since the start of the 20th Century, temperatures have risen 1.4°F and temperatures are predicted to rise another 2°F to 11°F over the next 100 years (National Academies 2008). The build-up of greenhouse gases in the atmosphere, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and chlorofluorocarbons (CFCs), is very likely the cause of the observed increase in average temperatures. Global greenhouse gas emissions are anthropogenic (human-induced). Global greenhouse gas emissions due to human activities have increased 70 percent between 1970 and 2004 (Intergovernmental Panel on Climate Change [IPCC] 2007). Along with higher temperatures, estimates of future climate change include more heat waves, changes in rates of precipitation, increases in hurricane activity, global sea level increase of 0.5 to 2 feet, decrease in arctic sea ice and glaciers, increase lengths of growing seasons, changes in blooming periods, and shifts in bird migration habits (EPA 2014).

The impacts of climate change on an agriculture and forestry ecosystem, similar to what is found in the Study Area, include increased yields in colder environments, reduced yields in warmer environments, increased insect outbreaks, and increased danger of wildfire (IPCC 2007).

What is climate change?

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change might result from natural factors and processes or from human activities. The term "climate change" is often used interchangeably with the term "global warming".

What is global warming?

Global warming refers to an average increase in the temperature of the atmosphere near the Earth's surface, which can contribute to changes in global climate patterns. However, rising temperatures are just one aspect of climate change (EPA 2014).

A review of the influence of climate change was performed by the Corps per their policy on civil works studies, designs, and projects (Corps 2014). The area of influence for this project is the contributing drainage area of the Missouri River watershed upstream of Gavins Pont Dam. This includes the majority of the states of Montana, North Dakota, Wyoming, and South Dakota (Corps 2015). This study concluded that the potential increases in flood magnitudes and stages are likely in the uncertainty range for the existing hydrology used to compute flood stages and also the stage effects caused by projected sediment deposition. For these reasons, it was not recommended to change the flood frequency values to anticipated climate trends.

C.9.1 No-Action Alternative

Traffic in the Study Area is projected to increase over the next 30 years by 57 percent, with an annual growth rate between 2 and 3 percent (2006-2034) (see Table 1-3 in Chapter 1). In the U.S., almost all of the energy consumed for transportation is supplied by petroleum-based products, with more than half related to gasoline consumption in automobiles and other highway vehicles. Vehicles emit carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons and have contributed increased greenhouse gas emissions over the last 10 years (EPA 2011b). With anticipated roadway repairs needed to corrected roadway deficiencies associated with flooding, slower and/or stopped traffic on N-12 would occur. However, vehicles are becoming more and more fuel efficient and release fewer and fewer emissions. At the same time, alternative energy sources for vehicles are being developed. The correlation between increased emissions and improved energy sources is unknown, as is the incremental effects any difference this would have on climate change.

C.9.2 Action Alternatives

The project would have three types of impacts on climate change. First, as described in Section C.1, Land Use, the project would convert rangeland, agriculture, woodland, and wetlands/open water to ROW, roads, and embankments. Terrestrial carbon sequestration is the process through which carbon dioxide from the atmosphere, a component of greenhouse gas emissions, is absorbed by trees, plants and crops through photosynthesis, and stored as carbon in biomass (tree trunks, branches, foliage and roots) and soils (EPA 2010). Changes in land use would remove these natural areas, and therefore release the carbon that the biomass is sequestering and contribute that carbon to greenhouse gas emissions.

Second, as under the No-Action Alternative, traffic in the Study Area is projected to increase over the next 30 years by 57 percent, with an annual growth rate between 2 and 3 percent (2006 through 2034) (see Chapter 1.0, Purpose of and Need for the Project, Table 1-3). See Section C.9.1, above. However, idling along N-12 due to roadway repair in the Study Area would decrease as the project would provide a reliable roadway that eliminates existing deficiencies that cause traffic delays.

Third, construction of the project would cause increased emissions for a short period of time from the construction and hauling vehicles and would produce construction waste. Non-road diesel engines include construction equipment such as backhoes, forklifts, generators, and pumps and can emit nitrogen oxides and particulate matter, which form ground-level ozone, or smog. EPA has adopted a comprehensive national program to reduce emissions from future nonroad diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions (EPA 2011c). Construction waste contributes to climate change due to the production of methane in landfills, the production of carbon dioxide through incineration of waste, and the production of emissions through the transport of waste to a facility (EPA 2011b).

Compared to the amount of rangeland, agriculture, woodland, and wetlands/open water that exist within the area of influence of climate change, the conversion of these land use types to ROW is minor. Also, the new ROW would also be native grasses, or in some cases, wetlands/open water, thus these areas would continue to provide terrestrial sequestration.

Traffic increases would be offset by more efficient vehicles and a decrease in idling or slow moving traffic.

Construction of the project is short-term and would not have an on-going effect on climate change within the area of influence of climate change for the project.

C.9.3 Avoidance, Minimization, and Mitigation

To mitigate for impacts on potential climate change resulting from the project, options were considered for land use conversion, increasing traffic and associated emission levels and construction methods. Conversion of land from agriculture, rangeland, woodland, and wetlands to ROW is unavoidable. To mitigate for the release the carbon that the biomass is sequestering, NDOR would replant all disturbed areas with native vegetation. For unavoidable impacts on trees, NDOR should consider replacing woodland areas with tree plantings in other areas. Finally, NDOR would mitigate for wetland impacts as described in Section 5.5 and in accordance with the Corps Section 404 permit.

Mitigation for increasing traffic is not proposed at this time. Improved technologies including more fuel-efficient cars and alternative energy sources for vehicles would occur regardless of the project.

The project inherently would avoid vehicle idling by creating a more reliable roadway. Other measures such as encouraging the use of public transit, bicycling or walking do not apply to a rural area such as that found in the Study Area. Therefore, mitigation for increasing traffic is not proposed at this time.

To the extent possible, NDOR should use construction equipment that is equipped with emission-control devices that reduce nitrous oxide and particulate matter emissions. The construction equipment would use so-called "clean diesel." Construction waste should be reused and recycled to the extent possible and incineration of construction debris should be avoided to reduce carbon dioxide emissions.

C.10 REFERENCES

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