Data Request No. 1:

Per ARSD 20:10:22:05, please provide a list of each notification that is required to be made to any other governmental entity. If no notifications are required beyond those provided in Table 5.0-1 in the Revised Application, please provide such a statement.

Response:

Table 5.0-1 is inclusive of all required permits and notifications to governmental entities for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

<u>Data Request No. 2</u>:

Per ARSD 20:10:22:07, please provide a complete description of the ownership structure of Dakota Access, LLC and DAPL-ETCO Operations Management, LLC.

<u>Response</u>:

Dakota Access, LLC is a Delaware limited liability company with its principal offices at 3738 Oak Lawn Avenue, Dallas, Texas 75219. The membership interest of Dakota Access, LLC is owned 75 percent by Dakota Access Holdings, LLC and 25 percent by Phillips 66 DAPL Holdings LLC.

(a) Dakota Access Holdings, LLC is owned 100 percent by Energy Transfer Partners, L.P. ("ETP"), a master limited partnership publicly traded on the New York Stock Exchange ("NYSE"). Energy Transfer Equity, L.P. ("ETE"), also a master limited partnership publicly traded on the NYSE, indirectly owns the general partner of ETP and certain of that partnership's limited partner units, and also owns the general partner of Regency Energy Partners, L.P. ("Regency") and certain of its limited partner units. (ETE and ETP are together referred to herein as "Energy Transfer"). Energy Transfer maintains its corporate headquarters at 3738 Oak Lawn Avenue, Dallas, Texas 75219.

(b) Phillips 66 DAPL Holdings LLC is owned 20 percent each by Phillips 66 DE Holdings 20A LLC, Phillips 66 DE Holdings 20B LLC, Phillips 66 DE Holdings 20C LLC, Phillips 66 DE Holdings 20D LLC, and Phillips 66 DE Holdings Primary LLC. The five Phillips 66 entities are owned 100 percent by Phillips 66 Project Development Inc. Phillips 66 Project Development Inc. is 100 percent owned by Phillips 66 Company. Phillips 66 Company is 100 percent owned by Phillips 66, a Delaware corporation. Phillips 66 maintains its corporate headquarters at 3010 Briarpark Drive, Houston, Texas 77042.

Operational services for the Dakota Access Pipeline will be provided by DAPL-ETCO Operations Management, LLC, a Delaware limited liability company, pursuant to an Operating Agreement. DAPL-ETCO Operations Management, LLC is 100 percent owned by La Grange Acquisition, L.P. La Grange Acquisition, L.P. is an indirect subsidiary of ETP.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

Data Request No. 3:

Please provide the results of the "expansion open season" mentioned in Section 10.0 of the Revised Application. Further, do the long-term binding contracts that resulted from the open season include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease?

Response:

Following the expansion open season, Dakota Access, LLC's entered into long-term binding contracts with customers that underpin a system capacity of not less than 467,500 bpd, with 90% of the system capacity allocated to committed shippers under the long-term binding contracts and 10% of the system capacity reserved for walk-up shippers.

The long-term binding contracts that Dakota Access, LLC has entered with customers do not include any clauses that would allow shippers to break the contract should demand for oil from the Bakken and Three Forks formations decrease.

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Data Request No. 4:

Per ARSD 20:10:22:10, please provide a description of present and estimated crude oil demand of those customers to be directly served by the pipeline. Included with the description, please provide

a. all "data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based";
b. information on the relative contribution to Bakken oil exports and U.S. refinery imports; and
c. a "statement on the consequences of delay or termination of the construction" of the pipeline.

Response:

Crude oil transported by Dakota Access, LLC will be capable of directly accessing a significant percentage of total U.S. refining capacity through the crude oil logistics infrastructure at the key crude oil terminalling hubs to which Dakota Access, LLC will provide service, whether solely or in conjunction with Energy Transfer Crude Oil Company LLC.

Accounting solely for pipeline connectivity,[¥] with respect to Dakota Access, LLC's deliveries to the "Patoka Hub" near Patoka, Illinois, the following refineries will have direct pipeline access to the Bakken and Three Forks production transported by Dakota Access, LLC to the Patoka Hub:

Refinery	Location	Capacity (barrels per day)
CITGO Lemont Refinery	Lemont, IL	172,045
Exxon Joliet Refinery	Joliet, IL	238,600
BP Whiting Refinery	Whiting, IN	413,500
Marathon Detroit Refinery	Detroit, MI	123,000
Husky Lima Refinery	Lima, OH	155,000
BP/Husky Toledo Refinery	Toledo, OH	135,000
PBF Toledo Refinery	Toledo, OH	160,000
Marathon Petroleum Canton Refinery	Canton, OH	80,000
Marathon Petroleum Robinson Refinery	Robinson, IL	212,000
Marathon Petroleum Catlettsburg Refinery	Catlettsburg, KY	242,000
WRB Wood River Refinery	Wood River, IL	336,000

With respect to Dakota Access, LLC's deliveries to the terminalling hub in the vicinity of Nederland, Texas, in conjunction with Energy Transfer Crude Oil Company LLC, the following refineries will have direct pipeline access to Bakken and Three Forks production transported by Dakota Access, LLC, again accounting solely for pipeline connectivity[¥]:

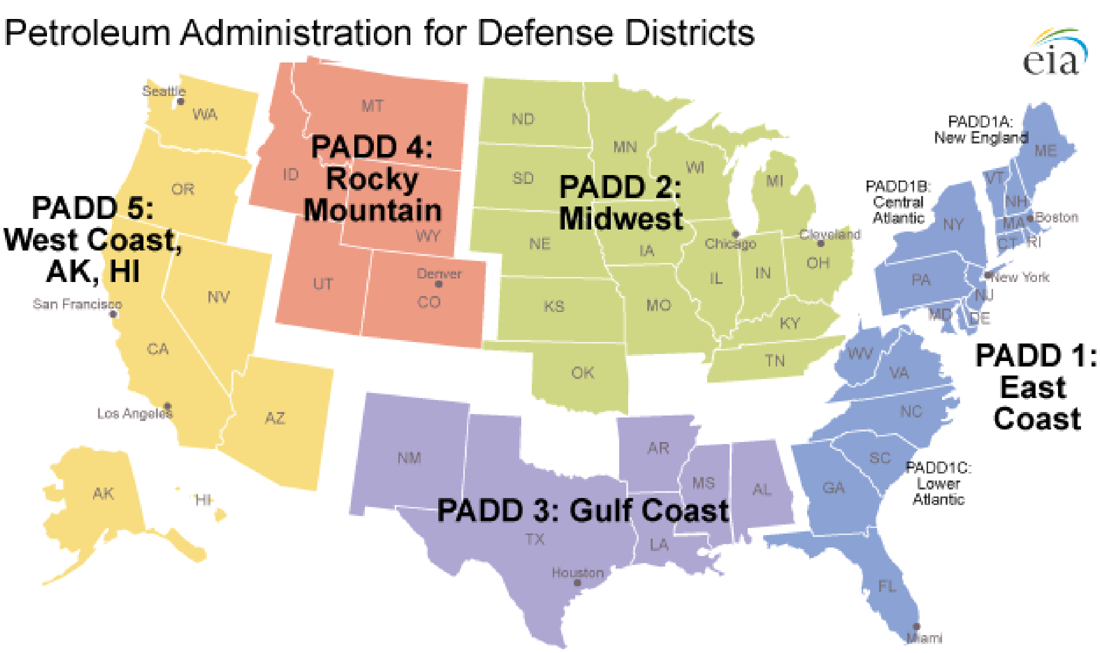
Refinery	Location	Capacity (barrels per day)
Exxon Beaumont Refinery	Beaumont, TX	330,000
Motiva Port Arthur Refinery	Port Arthur, TX	600,250
Total Port Arthur Refinery	Port Arthur, TX	225,000
Valero Port Arthur Refinery	Port Arthur, TX	330,000
Phillips 66 Lake Charles Refinery	Westlake, LA	239,400
CITGO Lake Charles Refinery	Lake Charles, LA	427,800

Calcasieu Refinery	Lake Charles, LA	78,000
Exxon-Mobil Baton Rouge Refinery	Baton Rouge, LA	502,500
Placid Refinery	Port Allen, LA	59,000
Motiva Convent Refinery	Convent, LA	235,000
Marathon Garyville Refinery	Garyville, LA	522,000
Motiva Norco Refinery	Norco, LA	238,000
Valero St. Charles Refinery	Destrehan, LA	205,000
Shell St. Rose Refinery	St. Rose, LA	45,000
Exxon-Mobil Chalmette Refinery	Chalmette, LA	192,500
Valero Meraux Refinery	Meraux, LA	125,000
Phillips 66 Alliance Refinery	Belle Chasse, LA	247,000

Crude oil can be moved by modes of transportation other than pipeline, such as truck, vessel, or rail. Thus, the market for Bakken and Three Forks production to be transported by Dakota Access, LLC is effectively even broader than what is represented by focusing on pipelines alone.

Companies regard as proprietary the details of the crude oil slates for their refineries, but all of these refineries have the capability to refine crude oil produced from the Bakken and Three Forks production region within their crude oil slates. Indeed, the significant demand for capacity on the Dakota Access Pipeline highlights that Dakota Access, LLC will enable Bakken and Three Forks production to reach markets where that production is desired.

The crude oil market in the U.S. is typically divided among five Petroleum Administration for Defense Districts (each, a "PADD"), which are defined by geographic areas within the U.S. as reflected by the following:



Source: U.S. Energy Information Administration

The Patoka Hub is located in PADD II, while the crude oil terminalling hub in the vicinity of Nederland, Texas, is located in PADD III. Below is the most recent data available from the EIA on imports into each PADD:

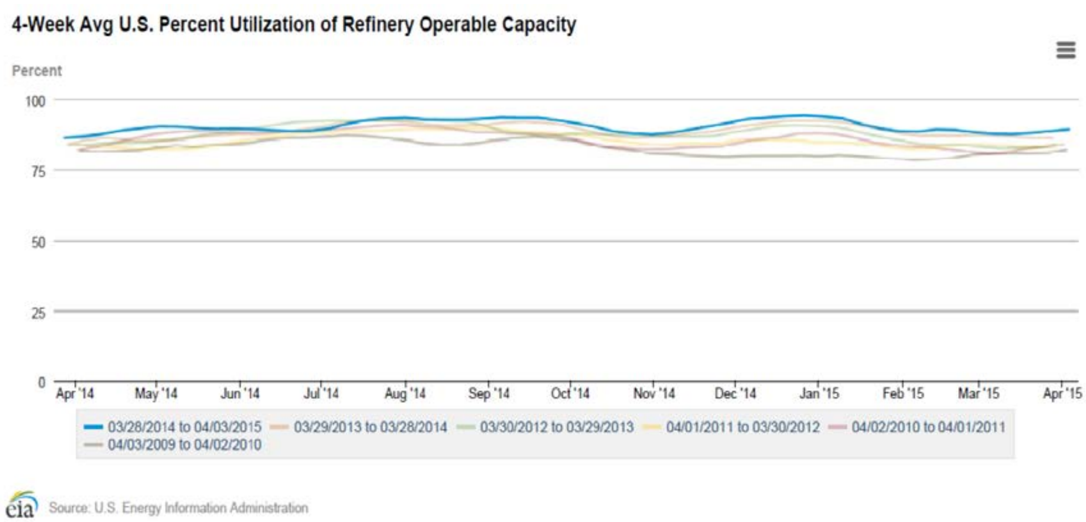
Table: PADD Imports (1,000 barrels per day)

	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15
PADD I	563	709	735	641	644	611
PADD II	2,005	2,142	2,058	1,859	2,224	2,006
PADD III	3,526	3,192	2,993	3,432	3,018	3,154
PADD IV	259	282	245	317	297	279
PADD V	1,118	1,183	1,099	1,025	1,027	1,099

Source: U.S. Energy Information Administration

This import data highlight that Dakota Access, LLC will establish a direct pipeline path for the delivery of Bakken and Three Forks crude oil production – domestically produced production – to reach the two PADDs that import the greatest volume of foreign crude oil.

Moreover, as reflected by the following chart, refineries in the U.S. are running at historically high utilization rates.



This high level of refinery demand is expected to continue in light of the strong margins in refining sector, driving continued demand for domestically produced crude oil like that from the Bakken and Three Forks production region.

Delay or termination of constructing the Dakota Access Pipeline would negatively impact the access that producers in the Bakken and Three Forks production region have to key U.S. refining markets. Likewise, it would restrict the availability of abundant supplies of domestically produced crude oil to the U.S. refineries that produce the petroleum products upon which the U.S. economy depends. These inefficiencies will negatively impact U.S. jobs in oil and gas production, as well as in domestic refining; result in greater dependence on foreign sources of crude oil; and impede greater efficiency in the domestic energy supply chain, which those in the U.S. depend upon to generate the wide array of petroleum products (*e.g.*, gasoline, diesel, and a wide array of chemicals) that are necessary to drive growth in U.S. jobs and the overall U.S. economy. Indeed, as reflected by the willingness of numerous shippers to make substantial contractual commitments to transport on the Dakota Access Pipeline, market participants believe that it is critical for the Dakota Access Pipeline to connect the Bakken and Three Forks production area to refineries in PADD II and PADD III refining markets in as timely a manner as possible..

Prepared By: Damon Rahbar Daniels
Title: Vice President – Commercial Operations

Data Request No. 5:

Please identify all high consequence areas (HCAs) located along the route.

Response:

There are no HCAs, as defined by PHMSA, located along the route within South Dakota.

Prepared By: Jack Edwards
Title: Project Manager

Data Request No. 6:

Please provide GIS shapefiles of the route and associated facilities.

Response:

GIS shapefiles provided are the latest route of the proposed pipeline. The provided route has minor changes from the filed route.
These minor changes were made;
Landowner Request
    Paralleling farm tiles
    Avoiding trees
    Avoiding water well
    Avoiding septic system

Culture Survey
    Cultural Site identified

Biological Survey
    Wetland avoidance

Constructability Issues

Prepared By: Jack Edwards
Title: Project Manager

Data Request No. 7:

Per ARSD 20:10:22:11, please provide a map showing cemeteries, places of historical significance, transportation facilities and other public facilities adjacent to or abutting the pipeline.

Response:

Revised maps with the requested information are included within Appendix A. Publicly available datasets were added to the topographic map set including cemeteries, transportation facilities (roads and airports), hospitals, and schools. Based on publically available datasets and field reconnaissance along the route, no hospitals, schools, or recorded places of historical significance are within or adjacent to the Project footprint, therefore these datasets are not included within the map legend.

Prepared By: Monica Howard
Title: Director – Environmental Science

<u>Data Request No. 8</u>:

Regarding Section 12.1 (ARSD 20:10:22:12), please provide further explanation on the criteria used (and how such criteria were measured and weighted) in the route selection process to demonstrate the following:

a) The route will not pose a threat of serious injury to the environment;
b) The route will not pose a threat of serious injury to the social and economic conditions of inhabitants or expected inhabitants in the siting area;
c) The route will not substantially impair the health, safety or welfare of the inhabitants; and
d) The route will not unduly interfere with the orderly development of the region.

<u>Response</u>:

The GIS route selection/optimization program was described in Section 12.0 of the December 22, 2014 submittal. The tables below outline all of the datasets and the weighting utilized for each dataset in the GIS routing program. Based upon the 4 factor siting criteria, Dakota Access has either routed the pipeline to avoid sensitive areas to remove any conflicts with the 4 factors or has incorporated mitigation measures into the project to minimize and avoid any impacts. For example, mitigation measures such as depth of cover and Dakota Access's commitment to bury the pipeline a minimum of 48-inches to allow unobstructed and continued land use on top of the pipe has been incorporated in the project across all agricultural lands. Avoidance of sensitive habitats such as wetlands, state or Federal threatened or endangered species or cultural resources and populated areas have been taken into account as part of the project route. In instances where total avoidance is not feasible, mitigation and minimization measures have been or will be employed to not pose serious injury to the environment. Any such unavoidable impacts will be permitted by the various state and Federal resource agencies that have primary jurisdiction over the resources. Overall the pipeline is being designed, routed and will be constructed and operated in a manner to meet or exceed all state and Federal requirements which further minimizes and avoids impacts to the health, safety and the welfare of inhabitants located near the vicinity of the pipeline. Last and based upon consultation and communications with the multiple community leaders and planning groups located along the pipeline route, the pipe will not interfere with the development of the region. Dakota Access believes that factors a. – d. above have been addressed through this routing process and through subsequent feedback throughout the design and routing process.

In addition to these routing measures, Dakota Access has outlined a series of safety and design measures in Section 23.7 of their application, that will be implemented on the Project to help ensure that the environment, inhabitants in the siting area, and the development of the region will not be impacted by the proposed Project.

Prepared By: Monica Howard
Title: Director **-** Environmental Science

GIS Criteria Assessed

Weighting
Preferred Routing (Low Risk)
Avoided Routing (Moderate Risk)
Excluded Routing (High Risk)

Engineering Datasets	Weighting
Existing Pipelines	Preferred- Collocation
Karst Topography	Avoid
Peak Ground Acceleration	Avoid Areas of Moderate to High PGA
Railroads	Avoid
Roads	Avoid
Side Hill Slope- Gradient	0-15% = Preferred ;15-20% = Low Avoid ; 20-30% = Low Avoid ; 30-40% = Moderate Avoid ; >40% = Exclude
Utilities	Power Plants = Avoid ; Substations = Avoid ; Powerline Corridors = Preferred Collocation
Environmental Datasets	**Weighting**
Aquifers	Avoid Surficial / Critical Aquifers Where Applicable
Bird & Wildlife Trail Site	Avoid
Brownfield Agreement Site	Exclude at 2,640'
Commercially Navigable Waterways	Avoid
Conservation Easement/Tax Credit Property	Avoid
Critical Habitat	Exclude
EPA 303 (c & d) Impaired Waters	Avoid
EPA Sites of Interests	Avoid
Fault Area	Avoid
FEMA Floodplain- 100 Year Floodplain	Avoid
Fish Hatchery	Exclude at 2,640'
Fishing Water Quality	Avoid
Forest Stewardship Land	Exclude
Game Land	Avoid
Geologic Unit	Crossing Tables Only - Further Analysis After Crossings To Be Provided
Hazardous Waste Site	Exclude
High Quality Water Zone	Avoid
Landslide Risk	Avoid
Local Forest	Avoid
Mining - Abandoned Mine	Avoid
Active Mining - Operation	Exclude
Mining - Permit	Avoid
Mining - Refuse	Exclude
National Trail	Exclude
National Registry of Historic Places (SHPO)	Exclude
Nature Preserve	Exclude at 500'
NHD Flowlines- Streams & Rivers	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
NHD Waterbodies	Perennial- Avoid ; Intermittent- Avoid ; Ephemeral- Low Avoid
National Pollutant Discharge Elimination	Exclude
NWI Wetlands	LUB = Avoid; LUS = Avoid; PFO = Avoid; PSS = Avoid; PEM = Low Avoid; PUB = Low Avoid; PUS = Avoid; RUB = Low Avoid
Oil & Gas Wells	Avoid
Private Conservation Land	Avoid
Protective Management Area	Exclude
Recreation Area	Exclude at 1,000'
Research Education Land	Avoid
Registered Heritage Area	Avoid
USACE Reservoir	Avoid
Sewer Pump	Exclude at 1,000'
Sewer Treatment Plant	Exclude at 1,000'
Stocked Trout Lake	Exclude at 1,000'

SSURGO	Crossing Tables Only - Further Analysis After Crossings To Be Provided
STATSGO (Depth to Bedrock)	Crossing Tables Only - Further Analysis After Crossings To Be Provided
State Forest Ownership Boundaries	Avoid
PHMSA- Drinking Water	Avoid
PHMSA- Ecologically Sensitive Areas	Avoid
State Historic Site	Exclude
State Parks and Natural Area Preserve	Avoid
Surface Water Intake	Exclude at 500'
Swine Lagoon Site	Exlude at 1000'
Underground Storage Tank	Exclude at 500'
USFS National Forest Boundaries	Exclude
Water Distribution Intake	Exclude at 500'
Water Distribution Meter	Exclude at 500'
Water Distribution Pump	Exclude at 500'
Water Distribution Tank	Exclude at 1,000'
Water Distribution Treatment Plant	Exclude at 1,000'
Water Wells	Avoid at 200'
Wild & Scenic River	Exclude
Wilderness Area	Exclude
Wildlife Management Areas	Avoid
Land Datasets	**Weighting**
Address Point	Avoid at 400'
Airports	Exclude at 2,640'
Animal Operations	Avoid at 1,000'
Antenna/Cellular Structure	Exclude at 250'
Boat Access	Exclude at 1,000'
Bridge	Exclude at 500'
Cemetery	Exclude at 1,000'
Church	Exclude at 1,000'
Dam	Exclude at 1,000'
Emergency Operation Center	Exclude at 1,000'
Fire Department/Law Enforcement	Exclude at 1,000'
Gas Plant	Exclude at 1,000'
Gas Station	Exclude at 1,000'
Golf Course	Exclude at 1,000'
Government Building	Exclude at 1,000'
Hospitals	Exclude at 1,000'
Industrial/Office Building	Exclude at 1,000'
Industrial Park/Industrial Site Boundary	Exclude at 1,000'
Institution/Nursing Home	Exclude at 1,000'
Land Ownership (Typical)	Federal = Exclude ; State = Avoid ; Local = Avoid ; Nondesignated = Low Avoid ; Other Protected Land = Avoid
Landfill	Exclude at 2,640'
Landmark	Exclude
Local Structure	Avoid at 250'
Military Installation	Exclude
PHMSA - Highly Populated Area	Exclude
PHMSA - Other Populated Area	Avoid
Pipeline Meter	Avoid at 50'
Race Track	Exclude at 1,000'
Retail Center	Exclude at 1,000'
School	Exclude at 1,000'
Transportation Terminal	Avoid at 500'

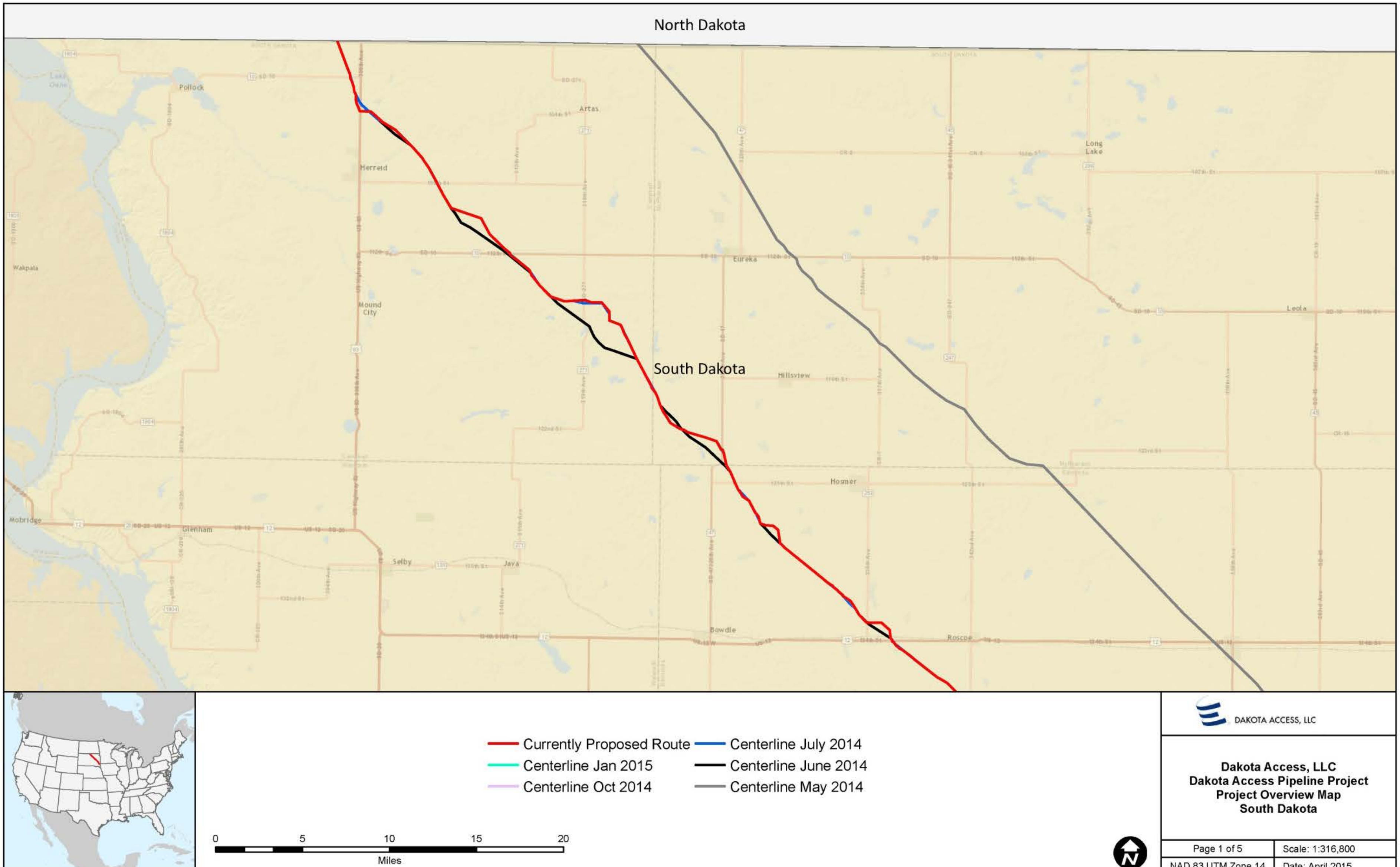
<u>Data Request No. 9</u>:

In section 12.2 (ARSD 10:10:22:12), please provide a description of any alternative route corridors considered and justification for choosing the proposed route over the alternatives.

<u>Response</u>:

See Data Response No. 9 Map below to view the original proposed routes and the final proposed route. The original routes were developed largely via desktop routing by a team of pipeline professionals. These routes were then optimized through field investigations and the GIS routing program as discussed within Section 12.0 of the December 22, 2014 submittal, and within Data Response No. 8. The output of the GIS routing program, combined with field survey results and micro routing considerations for non-desktop information gathered by the project team (e.g. environmental resources, landowner feedback, government feed-back [planned developments], have led to the basis of the current proposed route.

Prepared By: Jack Edwards
Title: Project Manager



Currently Proposed Route
Centerline Jan 2015
Centerline Oct 2014
Centerline July 2014
Centerline June 2014
Centerline May 2014

0 5 10 15 20
Miles

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
Project Overview Map
South Dakota

Page 1 of 5	Scale: 1:316,800
NAD 83 UTM Zone 14	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2_01b_Route_map.mxd

- Currently Proposed Route
- Centerline Jan 2015
- Centerline Oct 2014
- Centerline July 2014
- Centerline June 2014
- Centerline May 2014

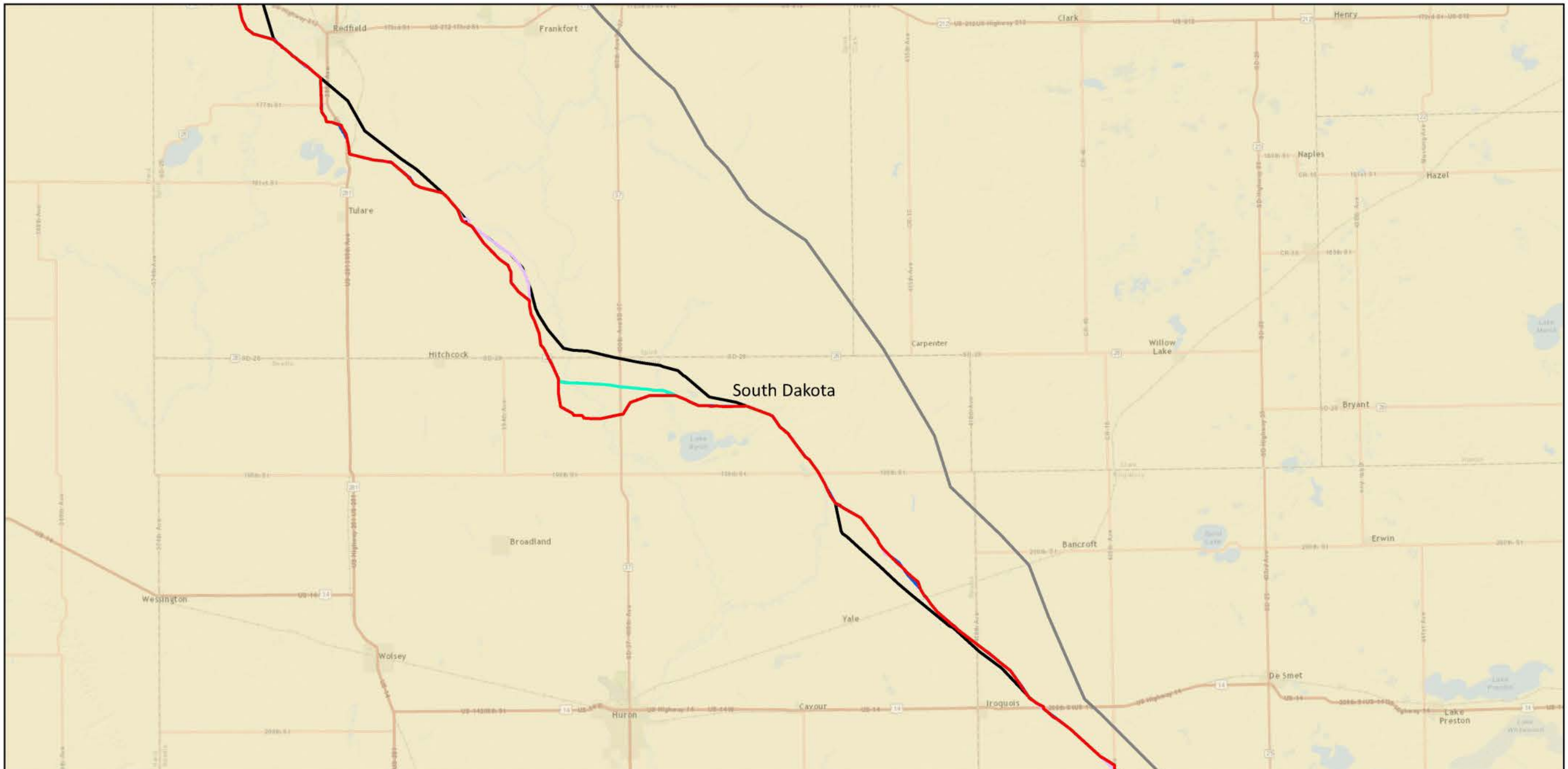
0 5 10 15 20
Miles

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
Project Overview Map
South Dakota

Page 2 of 5	Scale: 1:316,800
NAD 83 UTM Zone 14	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2_01b_Route_map.mxd



Currently Proposed Route
Centerline Jan 2015
Centerline Oct 2014
Centerline July 2014
Centerline June 2014
Centerline May 2014

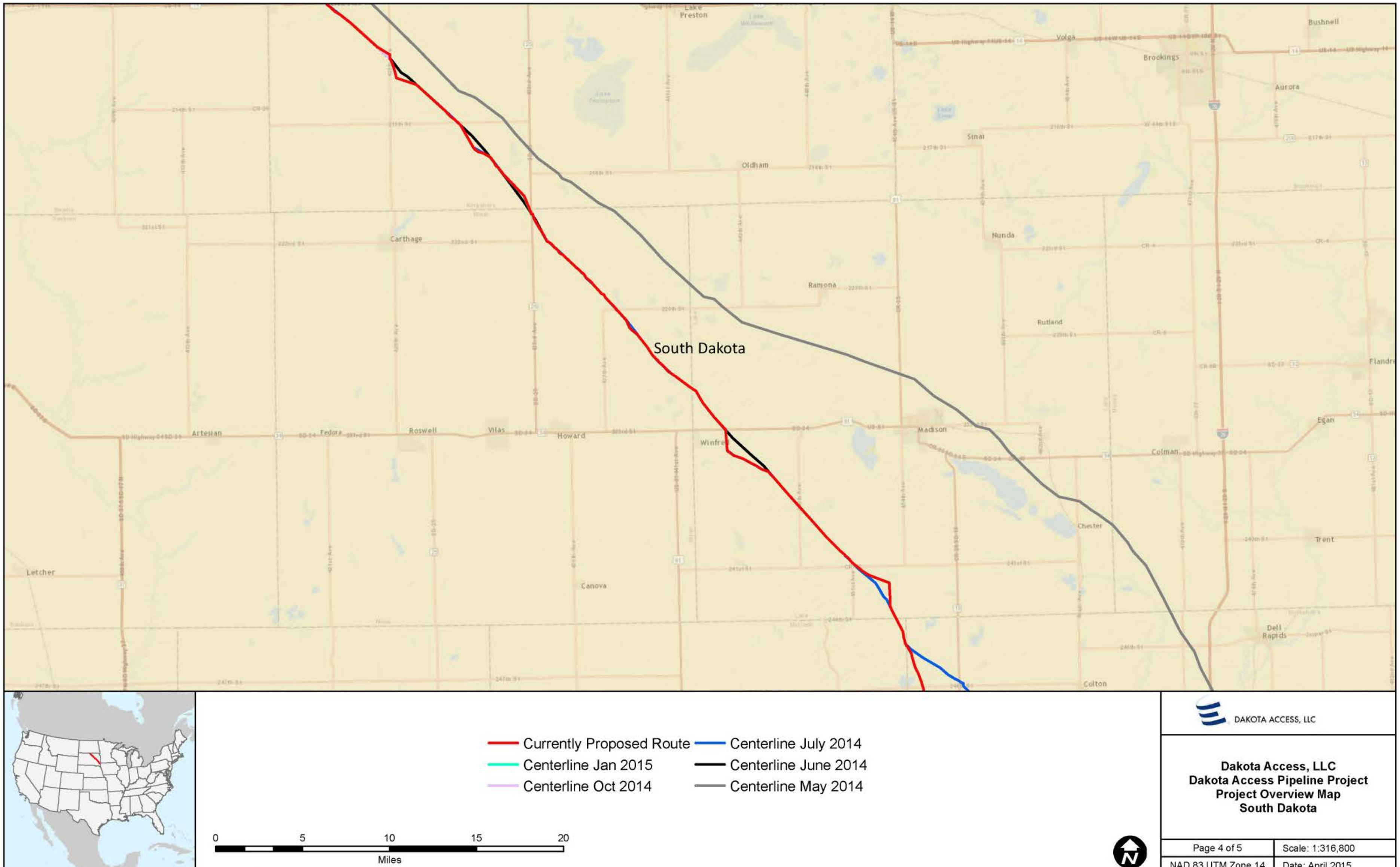
0 5 10 15 20
Miles

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
Project Overview Map
South Dakota

Page 3 of 5	Scale: 1:316,800
NAD 83 UTM Zone 14	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2_01b_Route_map.mxd

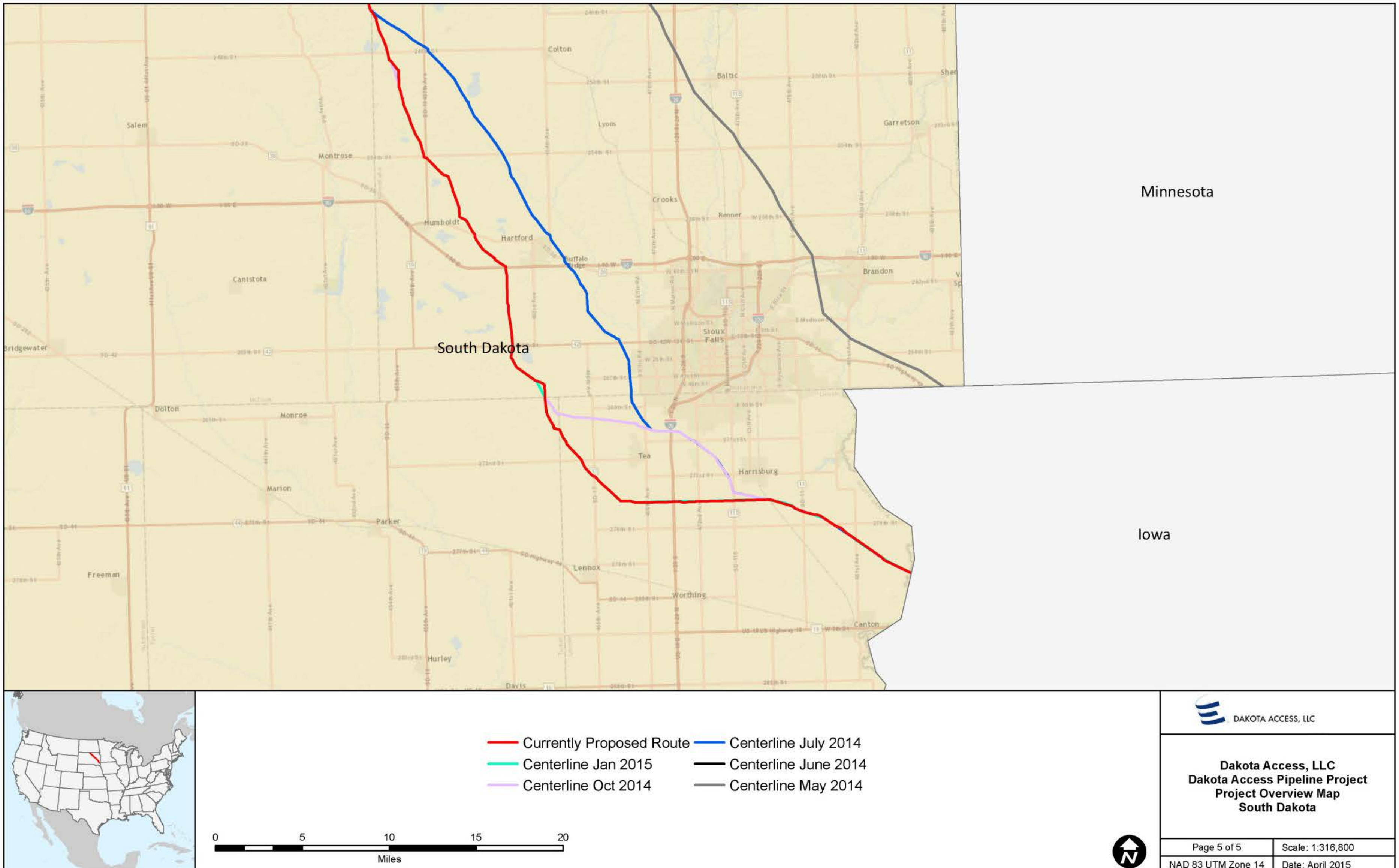


DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
Project Overview Map
South Dakota

Page 4 of 5	Scale: 1:316,800
NAD 83 UTM Zone 14	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2_01b_Route_map.mxd



Dakota Access, LLC
Dakota Access Pipeline Project
Project Overview Map
South Dakota

Page 5 of 5	Scale: 1:316,800
NAD 83 UTM Zone 14	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2_01b_Route_map.mxd

<u>Data Request No. 10</u>:

In accordance with ARSD 20:10:22:12(3), please include a detailed discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site. Include a discussion specifically addressing whether or not alternative routes in Minnehaha, Turner, and Lincoln counties could reduce the reliance upon eminent domain powers.

<u>Response</u>:

The use of eminent domain is dependent upon a host of factors. The pipeline is a linear facility extending for hundreds of miles and by definition must be contiguous. The parcels of property required for the construction and operation of the pipeline are numerous, but none-the-less interdependent and interrelated as part of this request and one factor, constraint, or landowner hold out cannot interfere with the contiguous routing in which a gap can occur. The pipeline crosses literally hundreds of separate discrete parcels of real estate, numerous environmental and contractibility constraints that when all combined result or define a route that is feasible, but may not avoid or mitigate the need to rely upon eminent domain to ensure the route is ultimately contiguous. The goal is to avoid, minimize and then mitigate as much as possible all foreseeable constraints but not arbitrarily or unduly route the pipeline based upon landowner personal preference such that one landowner is more affected than another and no more unreasonably than another based upon demographic criteria such as economic capability to influence the route, political standing or affiliation, race or social standing (environmental justice considerations). Therefore the routing is strictly based upon minimization of impacts to environmental resources, regulated areas as defined or managed by regulatory considerations, the South Dakota four-factor criteria, constructibility considerations and by Dakota Access's ability to procure the right-of-way through reasonable negotiated communications and easements. Only after all considerations and reasonable compromises have been made, alternate routes considered and failed negotiations occurred to resolve any disputes where the pipeline cannot be reasonable rerouted would Dakota Access rely upon Eminent Domain. Based upon the studies, surveys and all the criteria considered to date, Dakota Access does not believe that there are any other routes or actions that could be taken other than a "no-action" alternative that would reduce the potential for eminent domain across Minnehaha, Turner and Lincoln Counties. Lastly, Dakota Access is currently negotiating with the affected landowners along the entire route and in particular Minnehaha, Turner and Lincoln Counties and is making good progress on purchasing voluntary easements across the state and those counties and Dakota Access feels confident that there will not be any higher percentage or reliance of eminent domain in those counties than anywhere else along the pipeline in South Dakota. Currently, Dakota Access has secured approximately 60% voluntary easements across the state of South Dakota and 42% across Minnehaha, Turner and Lincoln Counties.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Data Request No. 11:

Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with ARSD 20:10:22:14(3).

Response:

See the attached response.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

<u>Data Request No. 12</u>:

In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

<u>Response</u>:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

Data Request No. 13:

In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Response:

See the response attached to Data Request No. 11.

Prepared By: Mark Miller/Craig Erdman – GeoEngineers
Title: Group Leader-Principal/Senior Engineering Geologists

<u>Data Request No. 14</u>:

How close is the pipeline to the Minnehaha County Wellhead Protection Area? Is this a sufficient distance in the event of a leak?

<u>Response</u>:

The closest point to the Minnehaha County Wellhead Protection Area is 0.43 mile. Spill models continue to be run and appropriate mitigation measures will be implemented to protect the water source.

Prepared By: Chuck Frey
Title: Vice President - Engineering

<u>Data Request No. 15</u>:

Please provide a map of all Wellhead Protection Areas along the route.

<u>Response</u>:

The only Zone A Source Water and Wellhead Protection Area identified by the South Dakota Department of Environment and Natural Resources (SDDENR) located near the pipeline is the Minnehaha Wellhead Protection Area as provided in the December 22, 2015 application submittal, and as Exhibit A-1 to the March 2015 submittal. Included below is an email from the SDDENR confirming this information and a map to illustrate the entire route through South Dakota and the respective location of this feature.

Prepared By: Monica Howard
Title: Director – Environmental Science

Archived: Monday, April 06, 2015 10:29:20 AM
From: Walsh, Brian
Sent: Thursday, June 12, 2014 2:04:13 PM
To: Ashley Thompson
Cc: Walsh, Brian; Brandner, Tom
Subject: RE: Proposed Pipeline
Importance: Normal
Attachments:
Minnehaha_County_WHPA.dbf Minnehaha_County_WHPA.prj Minnehaha_County_WHPA.sbn Minnehaha_County_WHPA.sbx Minnehaha_County_WHPA.shp Minnehaha_County_WHPA.shx MinnehahaCo_ZoneA_SWPA.dbf MinnehahaCo_ZoneA_SWPA.prj MinnehahaCo_ZoneA_SWPA.sbn MinnehahaCo_ZoneA_SWPA.sbx MinnehahaCo_ZoneA_SWPA.shp MinnehahaCo_ZoneA_SWPA.shp.xml MinnehahaCo_ZoneA_SWPA.shx

---

Hi Ashley,

We have reviewed the proposed route and, based on the information we have, it does not cross any Zone A (the most critical protection zones) Source Water or Well Head Protection areas except in Minnehaha County where it crosses the Minnehaha County Well Head Protection Area. Attached are shapefiles for the Zone A Well Head and the Source Water Protection areas in Minnehaha County.

It is DENR's recommendation that the pipeline be routed to avoid crossing any Zone A Well Head or Source Water Protection areas. Also, since the counties and communities are responsible for any management activities in these protection areas, DENR recommends you contact the affected counties to get the most up-to-date information about the protection areas and any ordinances or restrictions that may apply in those areas.

It is likely the proposed route will cross shallow aquifers not directly associated with Source Water or Well Head areas. If this occurs, DENR recommends the pipeline be designed, constructed and operated in a manner that protects these resources.

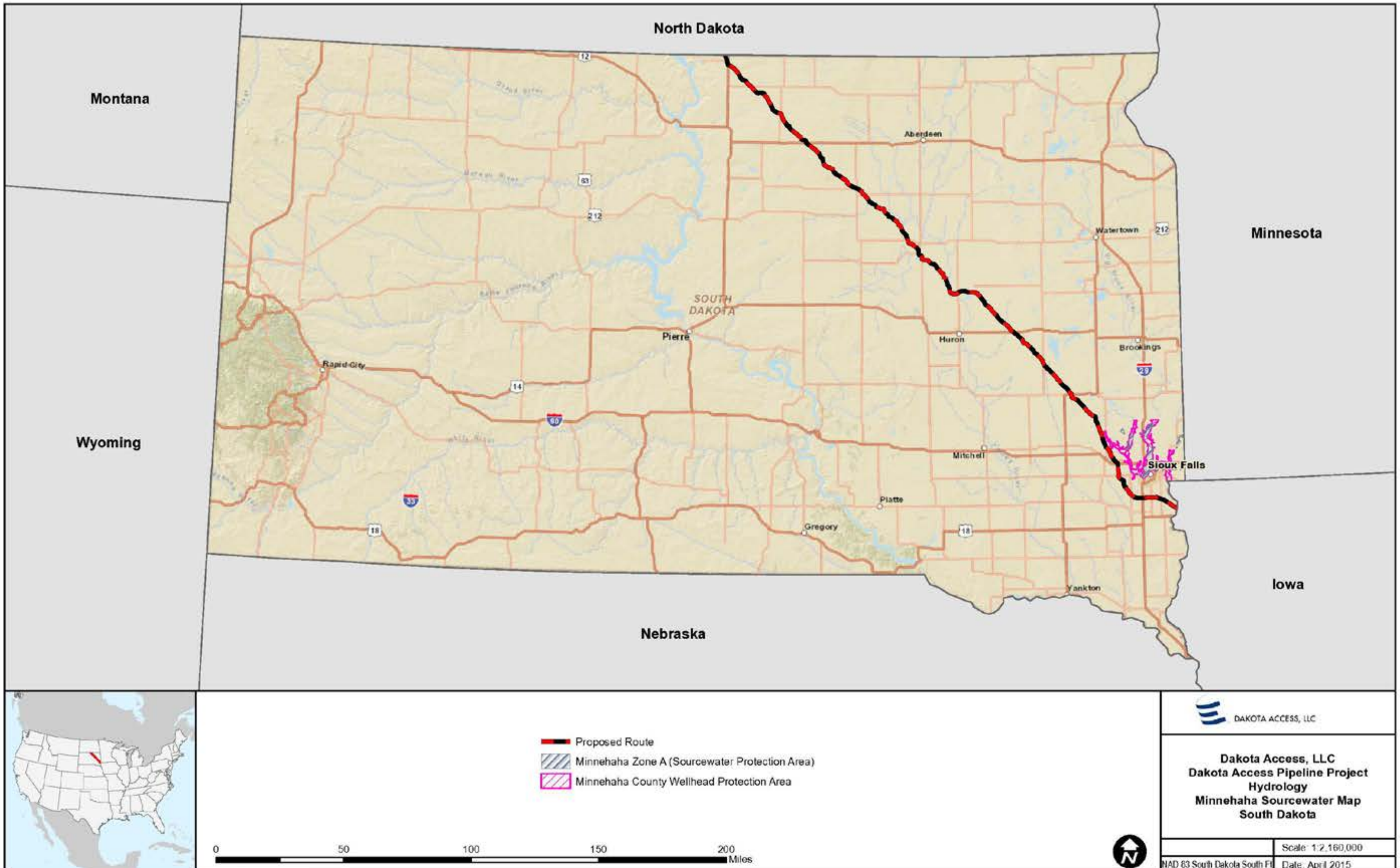
If you have any questions about this email or need additional information please let me know. Also, if the route changes let us know and we will be happy to re-evaluate it. For your information, below are several links to DENR's website and online databases that may be useful as you plan this project.

http://www.sdgs.usd.edu/ (South Dakota Geological Survey)
http://denr.sd.gov/des/wr/dbwrsearch.aspx (Water Rights / Wells)
http://denr.sd.gov/des/wr/dblogsearch.aspx (Well Driller's Logs)
http://denr.sd.gov/boards/pipelinetf.aspx (SD Underground Pipeline Task Force Report)

Finally, some of this information is sensitive so please keep that in mind and restrict its use to those who need the data to develop the pipeline project.

Sincerely,

Brian J. Walsh
Environmental Scientist III
SD DENR
523 E. Capitol Ave.
Pierre SD 57501
605.773.3296
Fax: 605.773.6035
brian.walsh@state.sd.us


North Dakota
Montana
Wyoming
Minnesota
Iowa
Nebraska
SOUTH DAKOTA
Aberdeen
Watertown
Pierre
Huron
Brookings
Rapid City
Mitchell
Sioux Falls
Platte
Gregory
Yankton
Proposed Route
Minnehaha Zone A (Sourcewater Protection Area)
Minnehaha County Wellhead Protection Area
0
50
100
150
200
Miles
DAKOTA ACCESS, LLC
Dakota Access, LLC
Dakota Access Pipeline Project
Hydrology
Minnehaha Sourcewater Map
South Dakota
Scale: 1:2,160,000
NAD 83 South Dakota South Ft
Date: April 2015

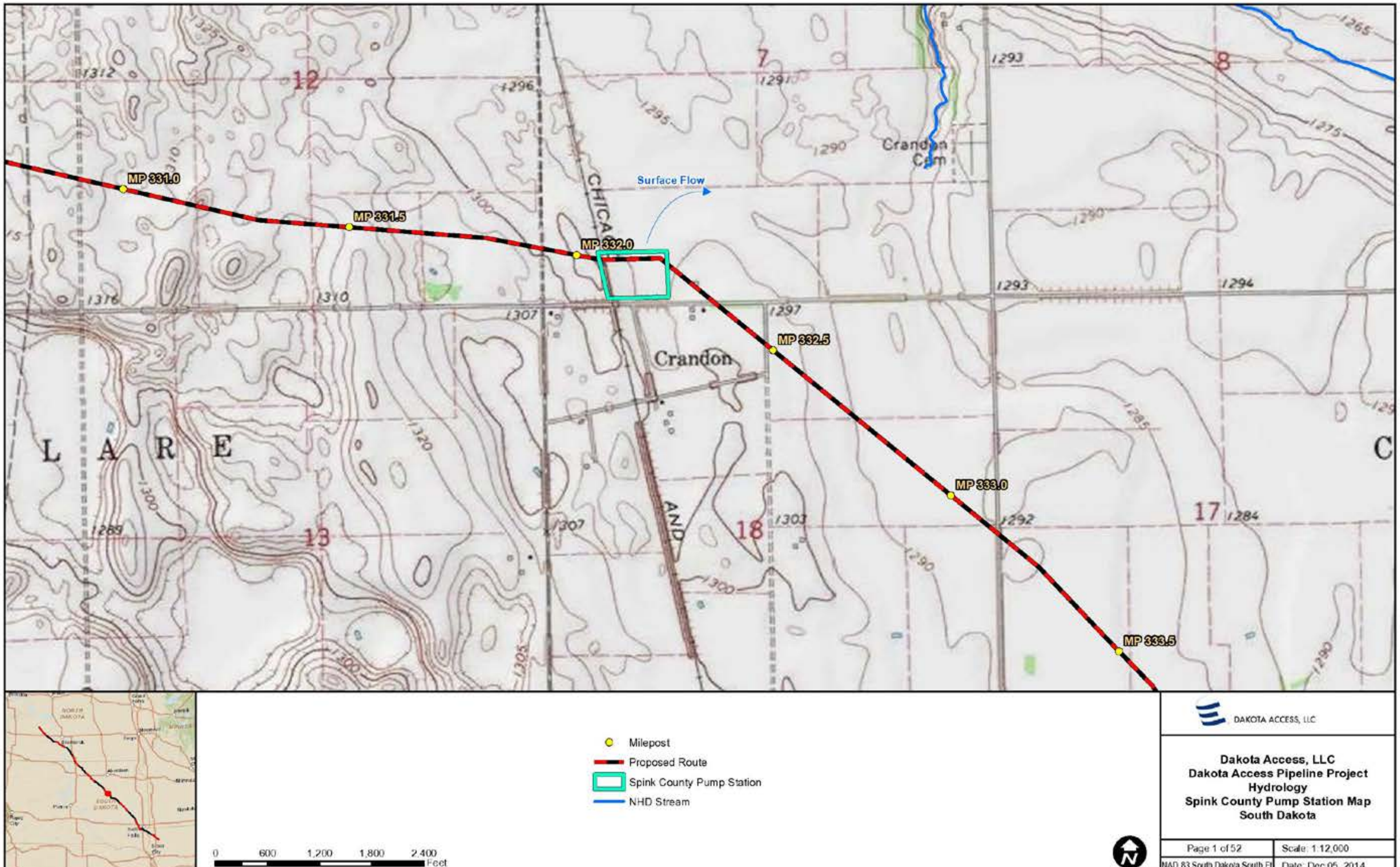
Data Request No. 16:

On the maps provided in Revised Exhibit A4, waterbodies and streams are shown; however, drainage patterns are not shown. Please provide updated maps that show the surface water drainage patterns before and anticipated after construction as required by ARSD 20:10:22:15(1).

Response:

As stated in Section 15.1 of the December 22, 2014 application submittal, the pipeline is a below ground facility where after construction the right-of-way will be restored to pre-construction contours and elevations and no change to the drainage patterns are expected as a result of pipeline construction. The pump station in Spink County is the only aboveground facility of any significance with the potential to interfere with drainage patterns. While construction plans have not been finalized for this facility, Dakota Access is committed to maintaining current drainage patterns at this site. Below is the map of the current surface flow at the Spink County pump station that was provided with the December 22, 2014 application submittal.

Prepared By: Jack Edwards
Title: Project Manager



- Milepost
- Proposed Route
- Spink County Pump Station
- NHD Stream

0 600 1,200 1,800 2,400 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
Hydrology
Spink County Pump Station Map
South Dakota

Page 1 of 52	Scale: 1:12,000
NAD 83 South Dakota South Ft	Date: Dec 05, 2014

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC\15A_PumpStation.mxd

<u>Data Request No. 17</u>:

Regarding section 15.5 (ARSD 20:10:22:15(5)), does Dakota Access expect the discharge of heated water to occur as a result of the project?

<u>Response</u>:

No discharge of heated water will occur.

Prepared By: Chris Srubar
Title: Associate Engineer

<u>Data Request No. 18</u>:

Per ARSD 20:10:22:16, please provide an analysis of the impacts of the pipeline's construction and operation on the breeding times and places and pathways of migration of terrestrial fauna, if any. Include in the analysis a discussion on Dakota Access's plans for stripping vegetation along the entire pipeline route before the start of breading season in mid-April in order to ensure ground nesting birds avoid the project area (as inferred from section 16.2.1).

<u>Response</u>:

In theory, construction of the pipeline could result in very localized and temporary displacement impacts to terrestrial fauna along the Project route through South Dakota. A majority of the species are mobile in nature, and the proposed ROW is roughly 150 feet wide, therefore along very minor compared to the entire landscape and available adjacent similar habitat it is theoretical that localized displacement of species will occur throughout the construction period at any given location and will reestablish following construction activities and restoration of the ROW. That said, given the large percentage of agricultural development along the Project ROW, existing species that may utilize the Project area are likely very accustomed to seasonal vegetation impacts on a far greater scale than this Project will cause. As such, Dakota Access does not believe there will be any measurable impacts to terrestrial fauna.

To ensure mobility and mitigate any impacts to the migration of terrestrial fauna across areas of active work, trench plugs will be installed at visible wildlife game trails, as identified by an EI or wildlife agency, and at livestock watering trails, as identified by the landowner, that intersect the trench line. Gaps will be left in spoil and topsoil stockpiles at all trench plugs to permit unimpeded movement of wildlife and livestock. Suitable ramps will be installed from the bottom of trench to the top with a minimum of 5-foot wide open path across the trench plug. A corresponding gap in the welded pipe string will be left at each trench plug.

Dakota Access has not made a commitment to strip vegetation along the entire pipeline route before mid-April but anticipates that large portions of the ROW will have ground disturbance by that point in time. As indicated in Section 16.2.1, we expect that construction activities will begin well in advance of the breeding season and accordingly ground nesting birds would choose other areas when locating their nests for the season. Even if the vegetation has not been stripped, there will be pre-construction activities associated with surveys which will cause an increased human presence thus likely making other areas more desirable as a nesting place.

Prepared By: Monica Howard
Title: Director – Environmental Science

<u>Data Request No. 19</u>:

Please provide all professional opinions and recommendations received from USFWS, SDG&P, SDDENR, and SHPO for the project.

<u>Response</u>:

Ongoing coordination has been occurring on a regular basis with federal and state agencies in South Dakota (including the aforementioned agencies); however, formal professional opinions or recommendations have been limited to date as the permitting/consultation process is on-going.

Dakota Access is working with the USFWS in relation to the crossing of easements under the USFWS's control. Additional coordination is ongoing with the USFWS as part of the USACE permitting process. Through such process, Dakota Access has consulted the USFWS regarding routing and assessment protocols for listed species that may be affected by the Dakota Access. The only protected species of potential concern in South Dakota is the Topeka shiner at 4 waterbody crossing locations. As surveys are still ongoing, an official opinion or recommendation has not been provided, but it is expected that a not likely to adversely affect determination will be concurred or issued by the USFWS.

Dakota Access has been in contact with the SDFG&P regarding Project impacts under their jurisdiction. It has been confirmed that no formal permit or approval from the agency, outside of their participation in the PUC process. The response provided in Data Response 18 above further addresses the determination Dakota Access has made regarding minor or negligible impacts to wildlife and the environment as a result of the Project.

Dakota Access has also been in contact with the SDDENR at times throughout development of the Project. It has been confirmed that, based on the communicated scope of the project, there is no formal permit or approval required from the agency and that the project Facility Response Plan will be submitted in accordance with regulation prior to operation.

Provided below is the South Dakota SHPO's formal comments on Dakota Access' cultural resource survey protocol, which were incorporated into the scope of work. Like the USFWS, the SHPO will also be formally consulted through the USACE permitting process for the Project.

Prepared By: Monica Howard
Title: Director – Environmental Science

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Monday, August 18, 2014 6:56 PM
To: Olson, Paige
Cc: Abby Peyton; Patrick Trader
Subject: RE: DAPL proposed SOW

Paige,

Thanks for your review. I think we can incorporate each of your suggestions. We will use a 1 x 1m unit at sites to provide better information on integrity. We will keep you informed of changes to the survey methods if/or when we would like to refine them. We will GPS all shovel tests (and units). For the last comment the sentence should read "Should *a potentially* eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." We would use this for sites that need an evaluation of significance.

Please let me know if you have any additional concerns.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Monday, August 18, 2014 11:43 AM
To: Beth McCord
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.

<u>Data Request No. 20</u>:

Per the applicant’s statement on page 32 of the Revised Application, please explain why four land use types “were not documented”. If these land use types do not exist along the route, please provide a statement as such. If these land use types do exist, please provide a map showing their locations.

<u>Response</u>:

Baseline surveys and desktop analysis for land use occurred during 2014 to classify land uses along the proposed pipeline route using classifications listed in Section 22:20:10:18 of the South Dakota Administrative Rules. Four land use types (i.e. existing and potential extractive nonrenewable resources; other major industries; municipal water supply and water sources for organized rural water systems; and noise sensitive land uses) were not identified along the proposed route, and therefore were not documented in the summary tables and Project mapping provided in the December 22, 2014 submittal.

Prepared By: Monica Howard
Title: Director – Environmental Science

<u>Data Request No. 21</u>:

Referring to section 19.0 (ARSD 20:10:22:19), are there any local land use controls that Dakota Access took into consideration for the proposed route in Minnehaha, Turner, and Lincoln counties? In addition, please explain how the project will affect the Lincoln County Comprehensive Growth Plan.

<u>Response</u>:

The project considered the growth plan maps of the cities of Sioux Falls, Tea and Harrisburg.
The list of data sets accounted for during the initial routing optimization process is provided in Data Request 8 above. Local land use considerations were taken into consideration once they were made available to Dakota Access. With respect to Minnehaha, Turner, and Lincoln counties, the details and results were provided in the March 19, 2015 submittal to the PUC. Additionally, we have reviewed the Lincoln County, South Dakota Comprehensive Growth Plan as amended and do not find any inconsistencies or incompatibilities therein.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Data Request No. 22:

Please provide documentation to support the economic benefits cited in Section 23.1 of the Revised Application.

Response:

The documentation to support the economic benefits cited in Section 23.1 of the Revised Application can be found in the report on the impacts of the Dakota Access Pipeline prepared by the Strategic Economics Group of West Des Moines, Iowa entitled ("*An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois")* dated November 12, 2014. The full report is available at the following link:

http://www.economicsgroup.com/reports/DAPL%20Report.pdf.

A copy of the full report is also attached to the response.

Prepared By: Stephen Veatch
Title: Sr. Director Certificates

<u>Data Request No. 23</u>:

In section 23.1, please provide support for the claim that "property values are not usually affected by the installation or presence of a pipeline in rural areas."

<u>Response</u>:

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

<u>Data Request No. 24</u>:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on land values where residential or commercial development is likely.

<u>Response</u>:

.

Literature on the topic shows that the existence of a pipeline has no impact on land values that can be discerned. Additionally, it would be impossible to forecast an impact on land values where residential or commercial development is likely without knowing the likelihood of the development, the timeline and other information.

A brief review of the literature supports this conclusion. See for example:

"Pipelines and Property Values: A Review of the Academic Literature" Somerville, and Wetzel, 2014.
"Natural Gas Pipeline Impact Study" INGAA Foundation, Inc., 2001.

"Pipelines and Property Values: An Eclectic Review of the Literature" Wilde, Loos and Williamson, 2012.

"Pipeline and Power Easements: How will they Impact Ranch Land Cost, Usage?"Stalcup *The Cattleman* March 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota

Data Request No. 25:

Per ARSD 20:10:22:23(1), please explain any long-term electric energy required to operate the pipeline pump station and other pipeline equipment. Further, please describe any new electric facilities that may be required for the pump station.

Response:

The South Dakota pump station will require approximately 15 Megawatts of electrical power to operate the pump motors and ancillary equipment. This power will be served by high voltage electrical lines and purchased from local electric supplier.

The pump station will require electrical transformers, located within an on-site substation, to transform the incoming high voltage to the appropriate voltage level needed to operate the pump motors. The substation will also contain circuit breakers, insulators, disconnect switches, communications and protective equipment needed to safely and remotely operate the facility.

The local electric supplier will be responsible for engineering and design of the substation, tapping the adjacent high voltage electrical line, constructing approximately 300-feet of power line and the on-site substation in its entirety, as well as operating and maintaining the substation facility once the pump station is in-service.

Prepared By: Chris Srubar
Title: Associate Engineer

<u>Data Request No. 26</u>:

Per ARSD 20:10:22:23(1), please provide a forecast of the impact on schools and other community and government facilities or services.

<u>Response</u>:

Overall the pipeline will be constructed in a relatively short period of time, potentially extending for a duration of 8 to 12 months across the entire state of South Dakota and more likely 2 to 4 months on any particular parcel of land. With that said, Dakota Access's construction will include a traveling set of construction staff that will move up and down the right-of-way where the majority of the construction staff will be transient or and will be in a given location for only the construction period. As such, the impact to any community services or facilities and schools will be temporary in nature. When evaluating the potential for the location of the construction staff within the region during construction, they will most likely group within the larger communities where existing governmental services or infrastructure exists. Furthermore, this level of influx is estimated to be a max of approximately 4,000 people, which 1/2 of those are expected to already live within the local communities or surrounding region. Therefore, there is a potential for around 2,000 additional people to be located across the state of South Dakota for approximately 8 to 12 months.

When considering the approximate 2,000 additional people within the region who will most likely choose to temporarily live within the larger communities located along the pipeline right-of-way, Dakota Access does not foresee any negative impacts to the local resources that cannot be accommodated by existing governmental services or facilities. In the event and in situations where there are no communities that have governmental or public type services, Dakota Access will require the contractor to provide those services or needs for the construction workforce (e.g. ambulatory services, access to doctors or nursing services, law enforcement - temporary security or traffic control, etc..).

Negative impacts to schools are not anticipated due to the short term nature of the construction. Most of the construction workforce will not relocate their families for the short duration and those that do will likely be very few and could be accommodated by the local school system. Until and such time the contractor workforce mobilizes to the project, it is unknown the number of children that would temporarily relocate to the project area, However any relocations would be temporary. For the construction workers who live in the communities, no changes are expected to result as these workers and their families already live within the communities.

Although the impact from a person count will largely be minor (less than 2,000 additional people), the economic impact to South Dakota and local communities from a tax perspective and purchasing of secondary goods and services will be tremendous both short and long term. In accordance with the economic analysis conducted by Strategic Economic Group (attached as part of the response to Request No. 22) and the spending projections by Dakota Access, the project value or cost in South Dakota is expected to be $820 million in project direct spending on materials that will be utilized and taxed in South Dakota, an additional $168.2 million in indirect spending from the construction work force and local purchasing of materials that will be utilized on the pipeline and lastly, approximately $186.2 million in induced spending or what is often referred to as spending or respending resulting from the direct spending. The result of this additional revenue that will be realized in South Dakota is an influx of revenue to the state and local governments from taxes. Based upon current tax laws and Dakota Access's initial projections during construction, approximately $35.6 million will be generated in state sales taxes ($29 million on materials alone for the pipeline and pump station) throughout construction and approximately $2.9 million will be generated and paid to the local governments where the proposed pipeline or its facilities traverse local taxing authorities.

In addition to sales tax benefits, the pipeline will generate long term property taxes that will benefit the state and in theory the local governments once the tax revenue is distributed to the local communities. Dakota Access year 1 property tax estimate is $12.34 million. This value may be less or more in subsequent tax years depending upon the prevailing tax laws and the methodology utilized to determine the applicable property tax accessed against the pipeline.

Lastly, after construction and into operations, Dakota Access is projecting to add up to 12 new direct permanent employees that will live and pay taxes within South Dakota and who will contribute to the tax base that will have a long term positive impact on the schools and other government services and facilities within the state.

For the one permanent above ground facility or pump station located in Spink County associated with Dakota Access, it is anticipated that a maximum of 8 to 10 permanent employees and their families will be located within the county, contributing to the tax base as well as to the local purchasing of goods and services associated with normal and expected living expenses. The addition of these permanent employees is not anticipated to negatively impact the communities and if anything will provide additional tax revenue to add to and support the existing governmental services, facilities and schools.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

Data Request No. 27:

Per ARSD 20:10:22:23(2), please provide a detailed forecast of the “long-range impact of property…taxes of the affected taxing jurisdictions”.

Response:

Based upon South Dakota current tax laws as promulgated by Chapter 10-37 of the South Dakota Codified Laws, the proposed pipeline’s taxes will be assessed centrally at the state level by the South Dakota Department of Revenue and Regulation utilizing what is referred to as real property ad valorem taxation of the real value of the property rather than on the quantity or some other form of measure.

At this time, the only measure Dakota Access has to determine an approximate ad valorem tax value is to estimate the actual cost of the pipeline for the first year tax value as there is no operational or company data available to generate the “value” of the pipeline, company or revenues or losses to determine the value of the company. After year 1, the operational data coupled with the depreciated value of the facilities and further coupled with the value of Dakota Access as a company compared to the portion of the company within South Dakota will be accessed to determine the ad valorem taxes that will be paid is subsequent years. Since there is not adequate data to provide a true estimate or basis of the long term tax benefits, Dakota Access is estimating it will pay approximately $12.34 million in ad valorem taxes for year 1 based strictly upon the cost of the pipeline and asset in South Dakota. Since any other data in subsequent years would be purely speculative at this time, estimates beyond year 1 are not reasonable or provided herein.

Prepared By: Megan McKavanagh
Title: Manager – Property Tax

Data Request No. 28:

Please provide more specific employment estimates, as specified in ARSD 20:10:22:24.

Response:

During construction, Dakota Access anticipates that there will be three mainline construction spreads. These spreads will include approximately 700 to 1,000 persons per spread for a total for 2,100 to 3,000 persons for the pipeline portion of the project. There will be one additional contractor for the pump station who will have approximately 400 to 600 persons. Total Approximate labor will be no less than 2,500 to a maximum of 3,600 persons. Of these persons and based upon commitments from the various trade unions as part of the Pipe Line Contractors Association, roughly 50 percent of the labor will come from South Dakota or from the labor halls that service South Dakota
Based upon these labor estimates, Dakota Access anticipates paying approximately $155 million in labor payments.

During operations of the pipeline, Dakota Access estimates it will hire and permanently staff 10 to 12 employees in South Dakota, with the majority located within Spink County. This includes:

Employees would work at the pipeline facility in Spink County, SD

1 - Supervisor, Pipeline Operations
1 - Administrative Assistant
6 - Pipeliners
2 - Electrical Technicians
2 - Mechanical Technicians

Prepared By: Jack Edwards
Title: Project Manager

<u>Data Request No. 29</u>:

Please revise section 4 of the Agriculture Impact Mitigation Plan to include that landowner representative's and EI's email addresses will be provided to landowners.

<u>Response</u>:

The Agriculture Impact Mitigation Plan has been revised to state that email addresses will also be provided. The modified document is included as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Data Request No. 30:

In section 5 of the Agriculture Impact Mitigation Plan, what is the company's definition of "substantial disturbance" when used in the definition of pipeline construction?

Response:

In the context of defining pipeline construction impacts to agricultural areas, "substantial disturbance" would be defined as normal construction activities to include topsoil stripping, trenching, heavy equipment traffic, and other related ground disturbing activities associated with installing the pipeline.

Prepared By: Jack Edwards
Title: Project Manager

<u>Data Request No. 31</u>:

Regarding Section 6.e of the Agriculture Impact Mitigation Plan, will all trench and pit dewatering activities occur within the right of way? If not, how will Dakota Access ensure landowners approve of the discharge on their property and repair any damage that may result from the discharge?

<u>Response</u>:

Dakota Access intends to locate dewatering discharge points within the Project right-of-way. While the discharged water would not necessarily be contained within the right-of-way, discharge activities would be monitored and adjusted as necessary to avoid property damage (e.g. excessive flooding of a field that would impact crops, scouring or erosion, offsite deposition of sediment, etc). In some cases, site specific conditions may prohibit the discharge point from being within the right-of-way and alternative discharge locations would be required. In any location where discharge points would be required outside of the Project right-of-way, landowner approval will be obtained prior to the activity and the area would be restored to pre-construction conditions.

The Agriculture Impact Mitigation Plan has been modified to clarify this and is attached as Appendix B.

Prepared By: Jack Edwards
Title: Project Manager

Data Request No. 32:

Please propose an indemnity bond amount, as will be required per SDCL 49-41B-38.

Response:

Dakota Access proposes an indemnity road bond totaling $15 million.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering

<u>Data Request No. 33</u>:

Per SDCL 49-41B-5.2, please describe how the applicant carried out the required notice, specifically addressing concerns brought up at public hearings and in comments filed within the docket.

<u>Response</u>:

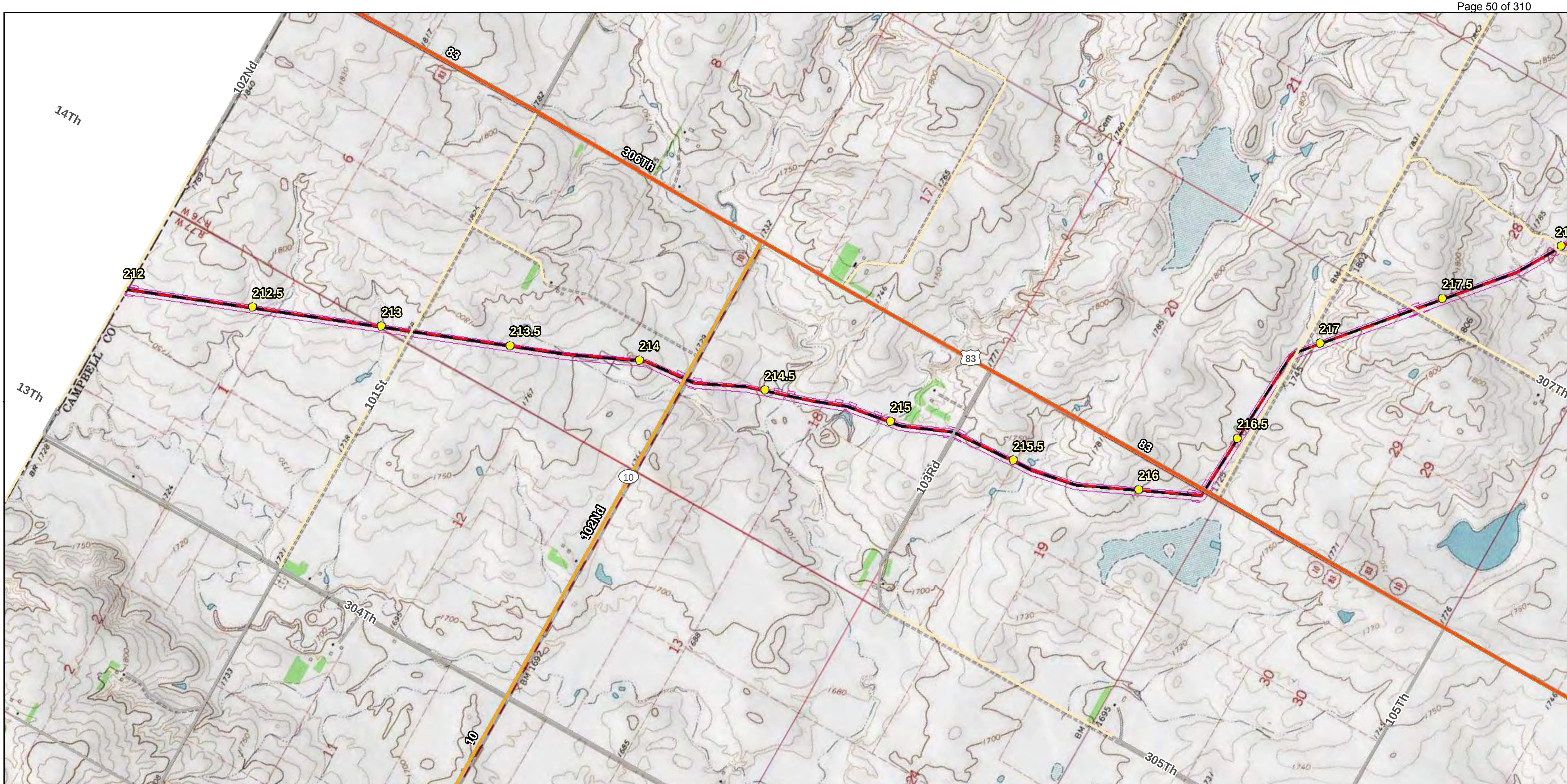
Applicant developed a list of all traversed and abutting landowners located within one half mile of the proposed pipeline centerline by obtaining the ownership lists from the county tax records for property ownership. This ownership data was cross-referenced against the county property delineation maps and also verified as much as possible by civil survey, public property data bases and landowner records and property title records that could be reasonable accomplished/reviewed ahead of the notice period. Therefore the data and notices were based upon public data as maintained by each respective county tax office for counties traversed by the pipeline.

Once the data was obtained from the tax office, the Applicant created a spreadsheet of parcels crossed by the proposed pipeline. The spreadsheet contained names and addresses of owners of record of the parcels. Applicant's attorneys, once application was made and public meetings schedule obtained from the Commission, sent notice by registered mail to those owners of record as delineated by the tax offices. Applicants also caused notice to be published in legal newspapers in each county in which the pipeline route was located.

Notice was sent by registered mail during the week of December 15, 2014. Publishing in the newspapers was conducted that week and in subsequent weeks starting on December 17, 2014 and concluding on December 26, 2014.

Applicant filed an amended application with a different route on December 23, 2014. Notice of the public meetings was mailed to landowners on that route as delineated by the tax office records during the week of January 7, 2015. Applicant's attorneys filed proof of notice on January 14, 2015.

Prepared By: Brett Koenecke
Title: Project Counsel in South Dakota



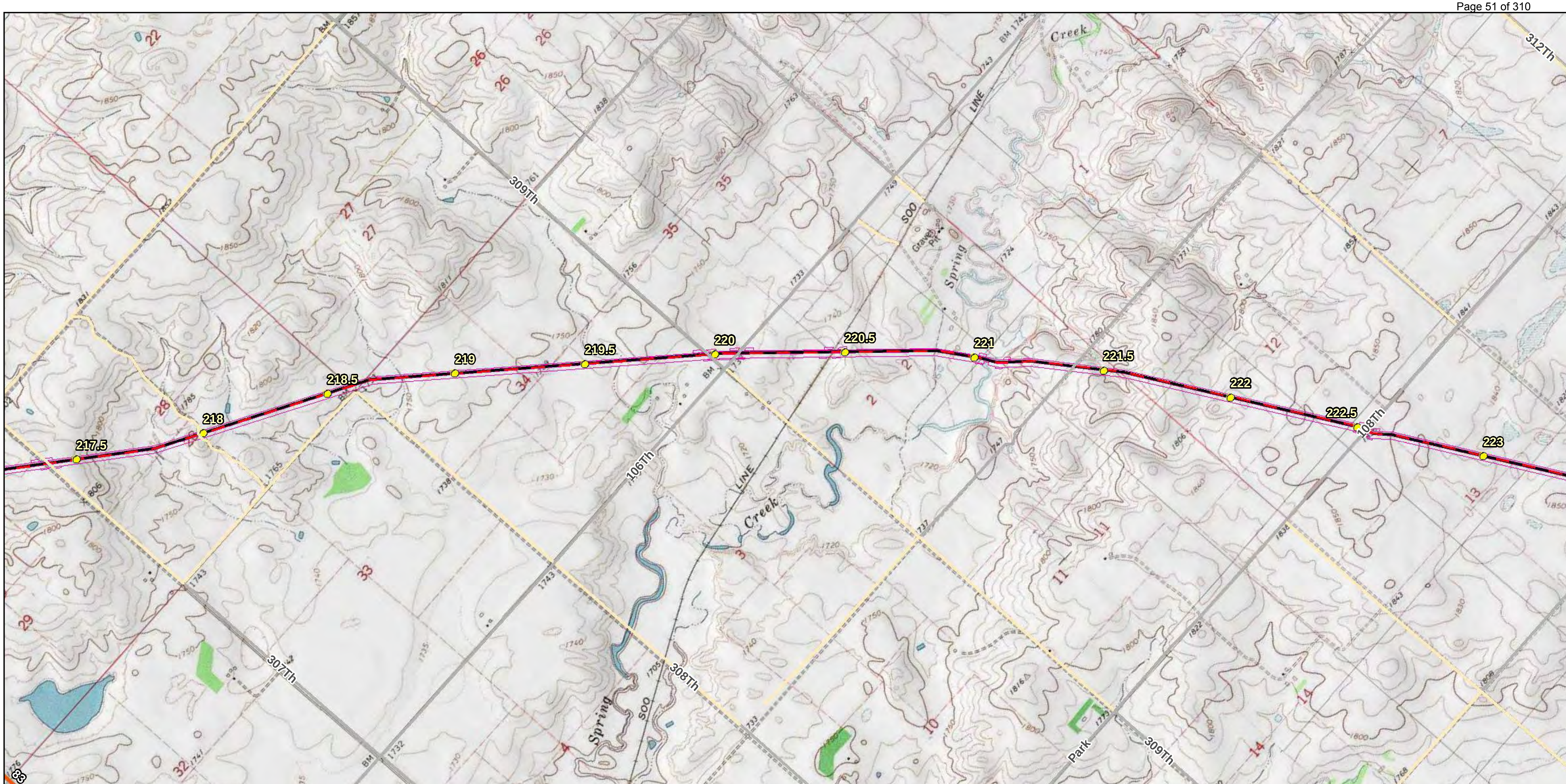
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 1 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



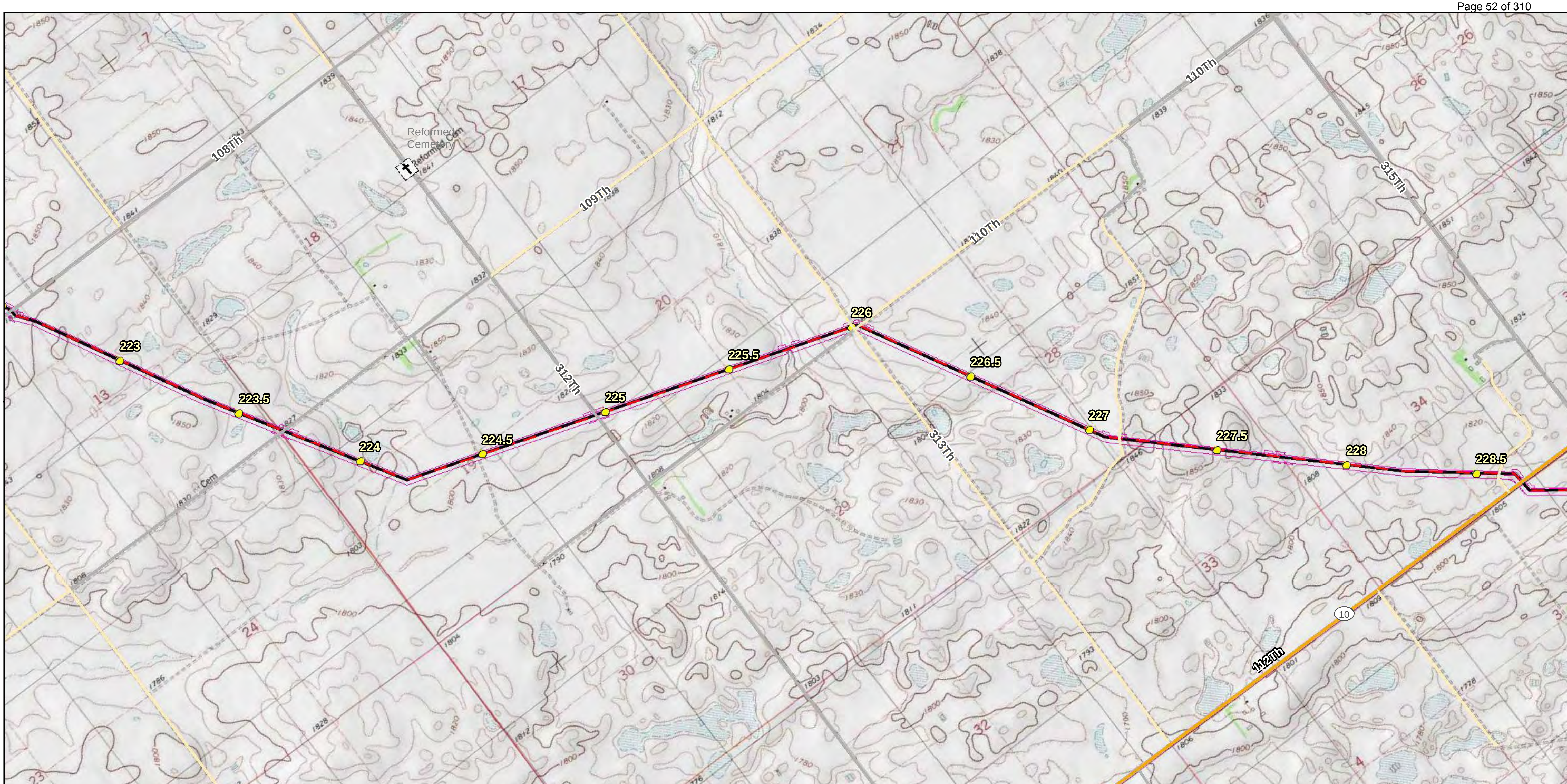
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 2 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

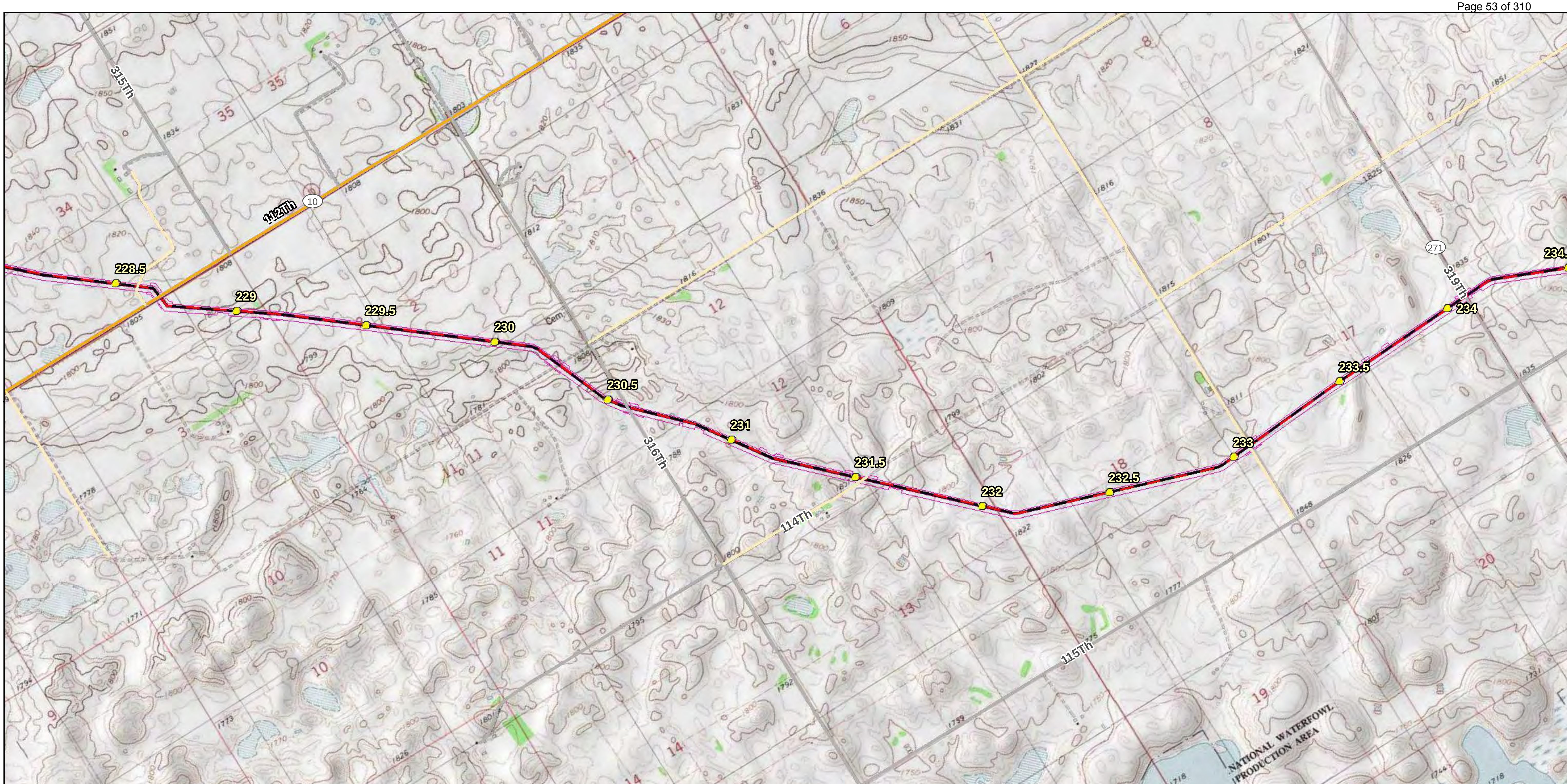
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 3 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



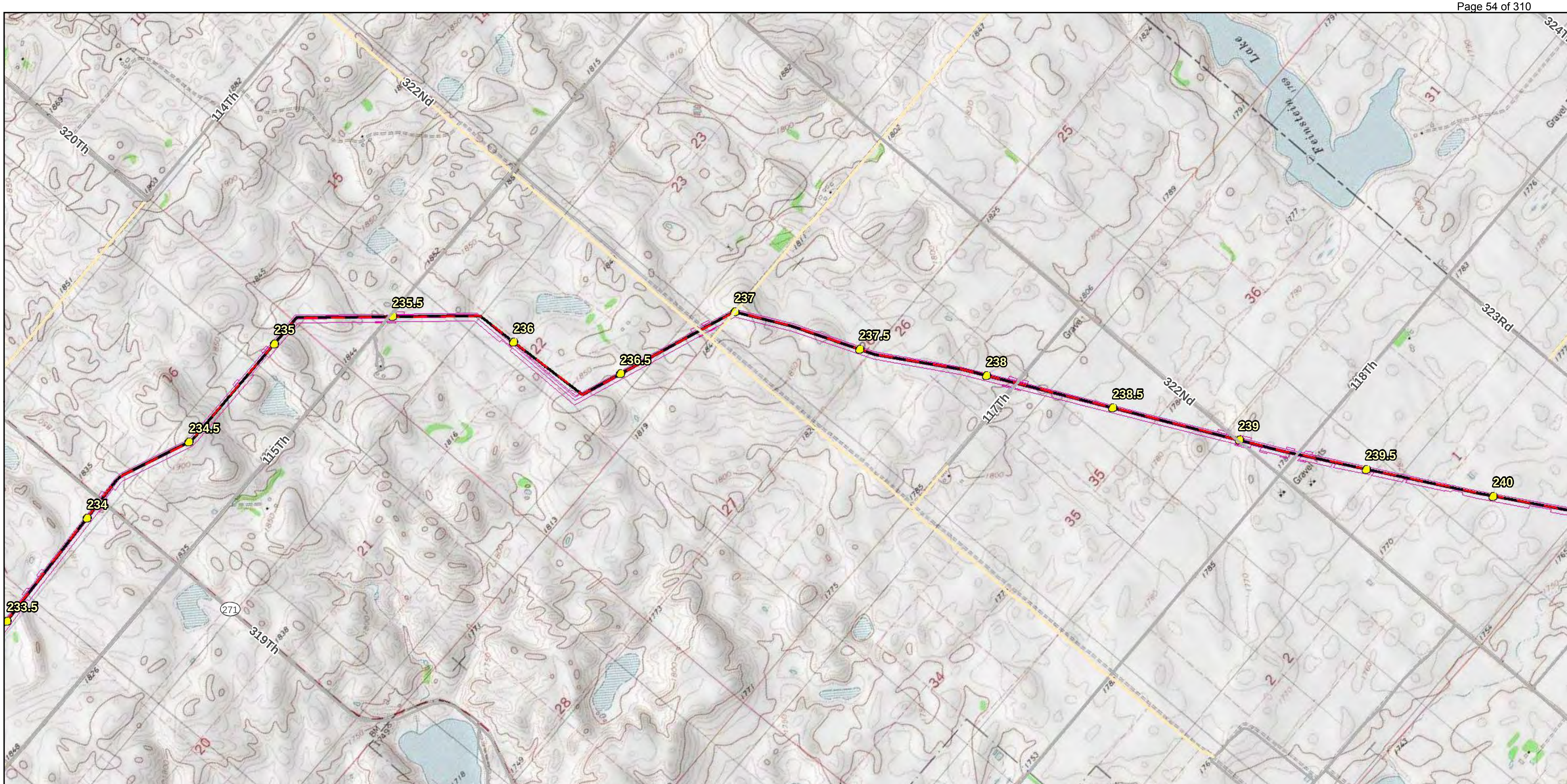
Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 4 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

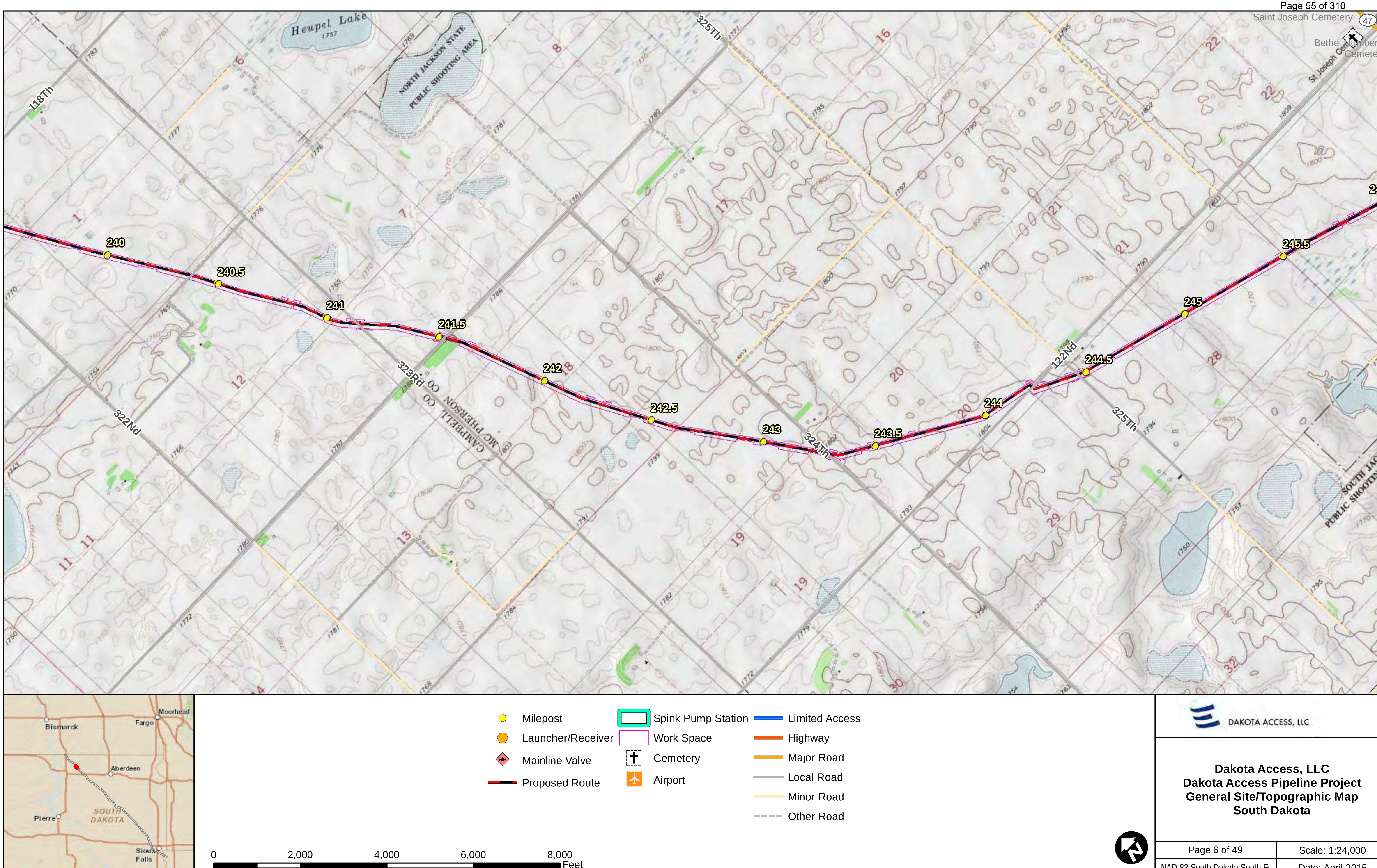
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 5 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd

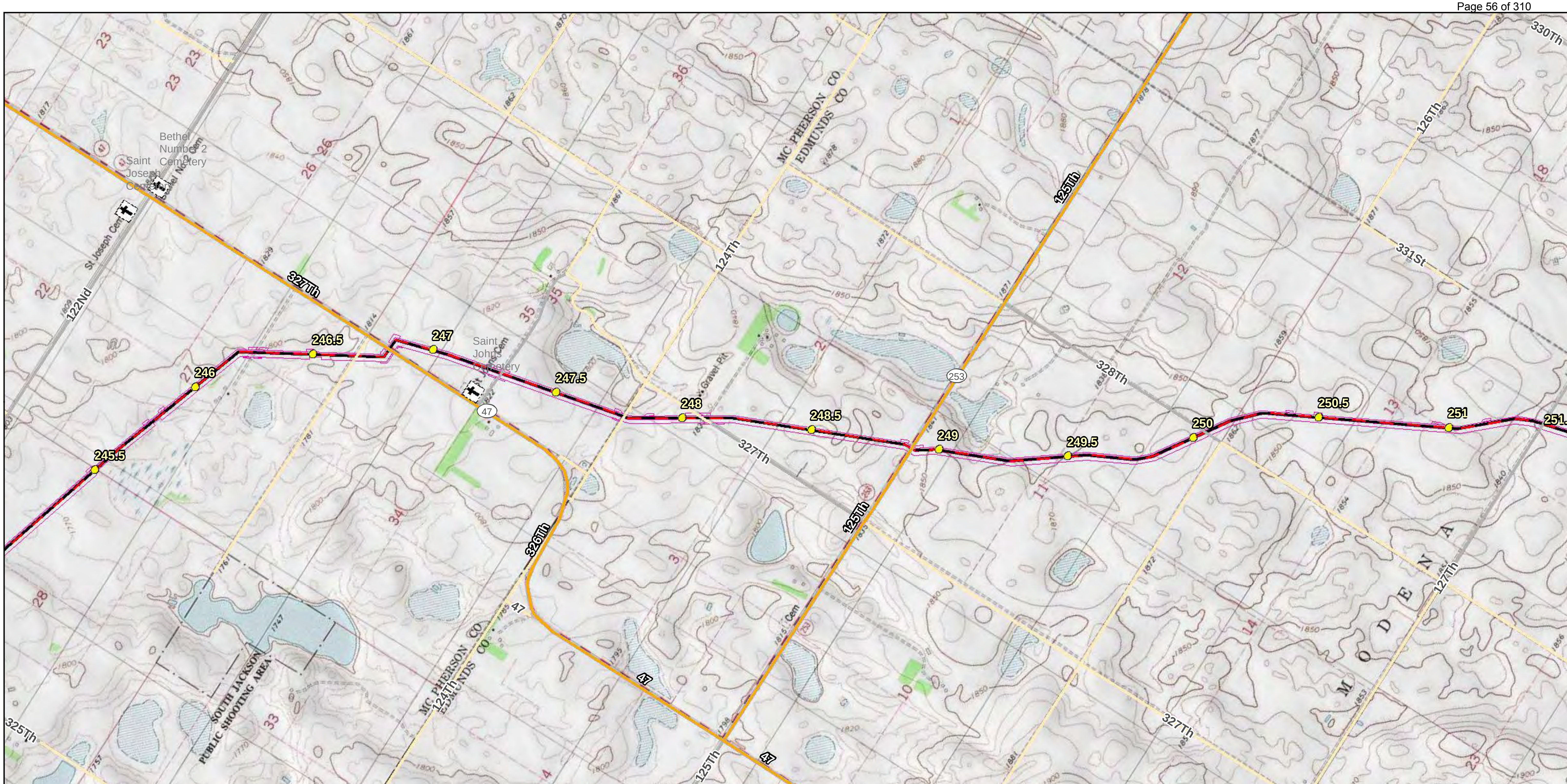


DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 6 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

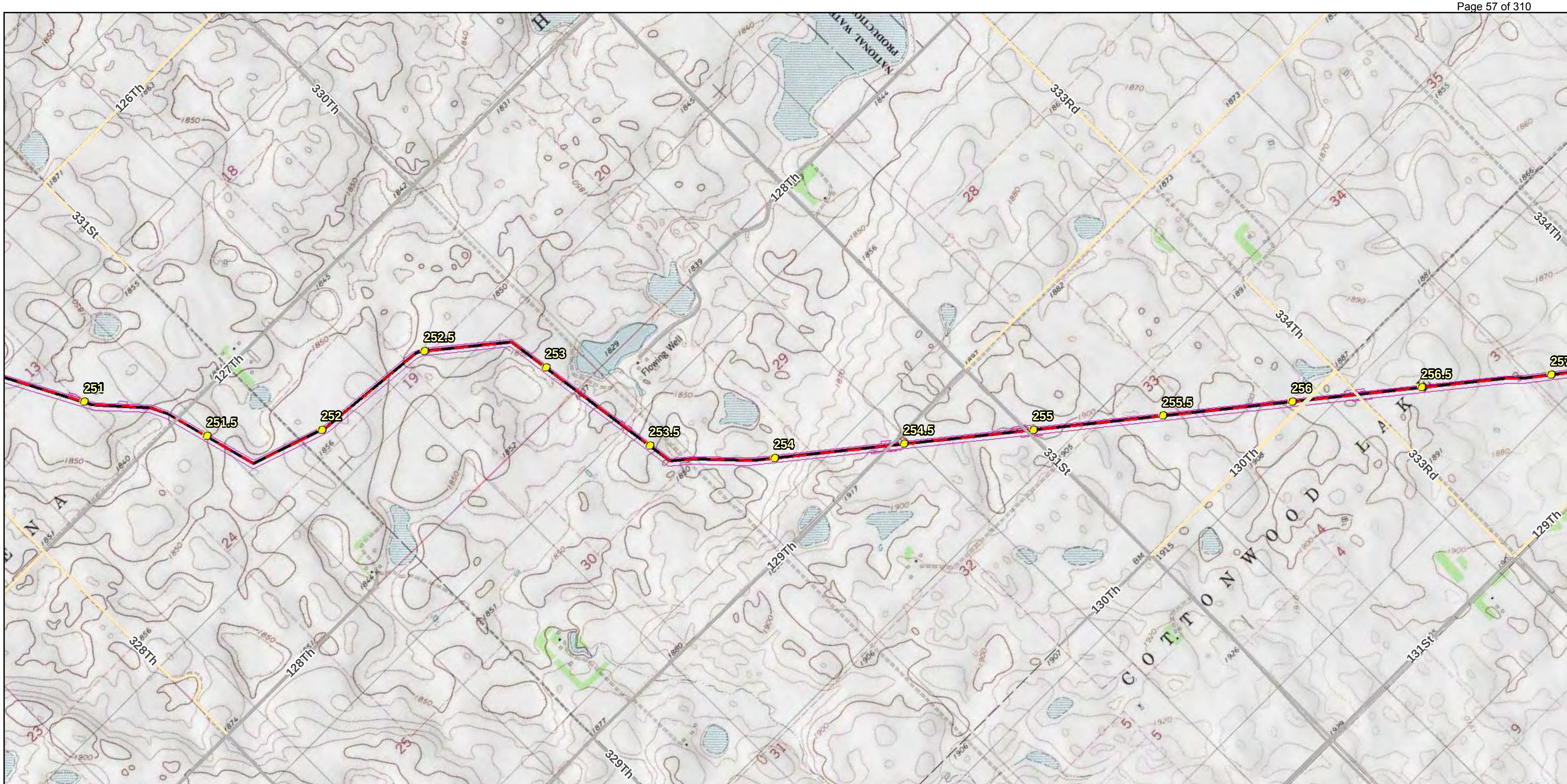
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 7 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

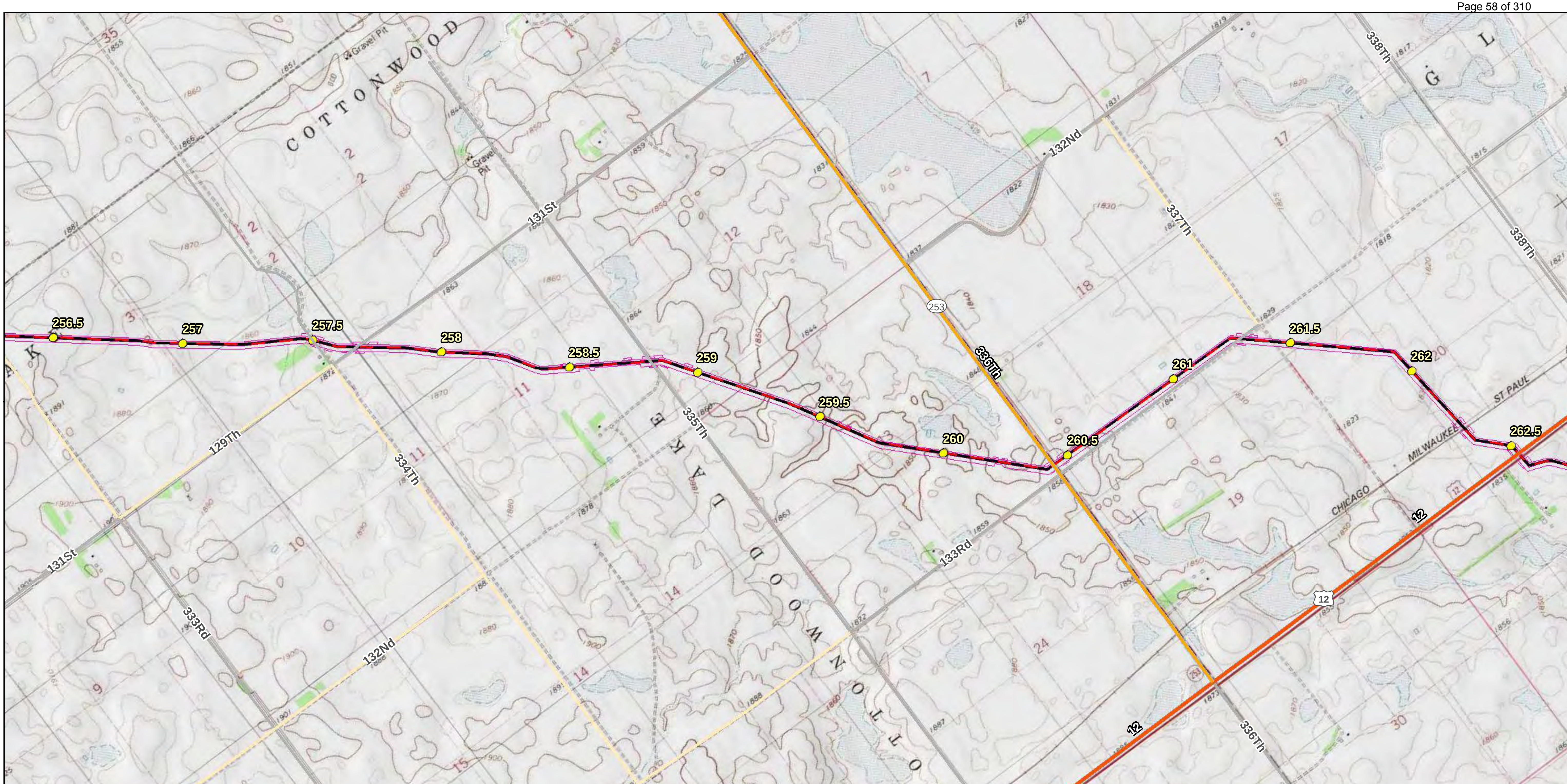
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 8 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



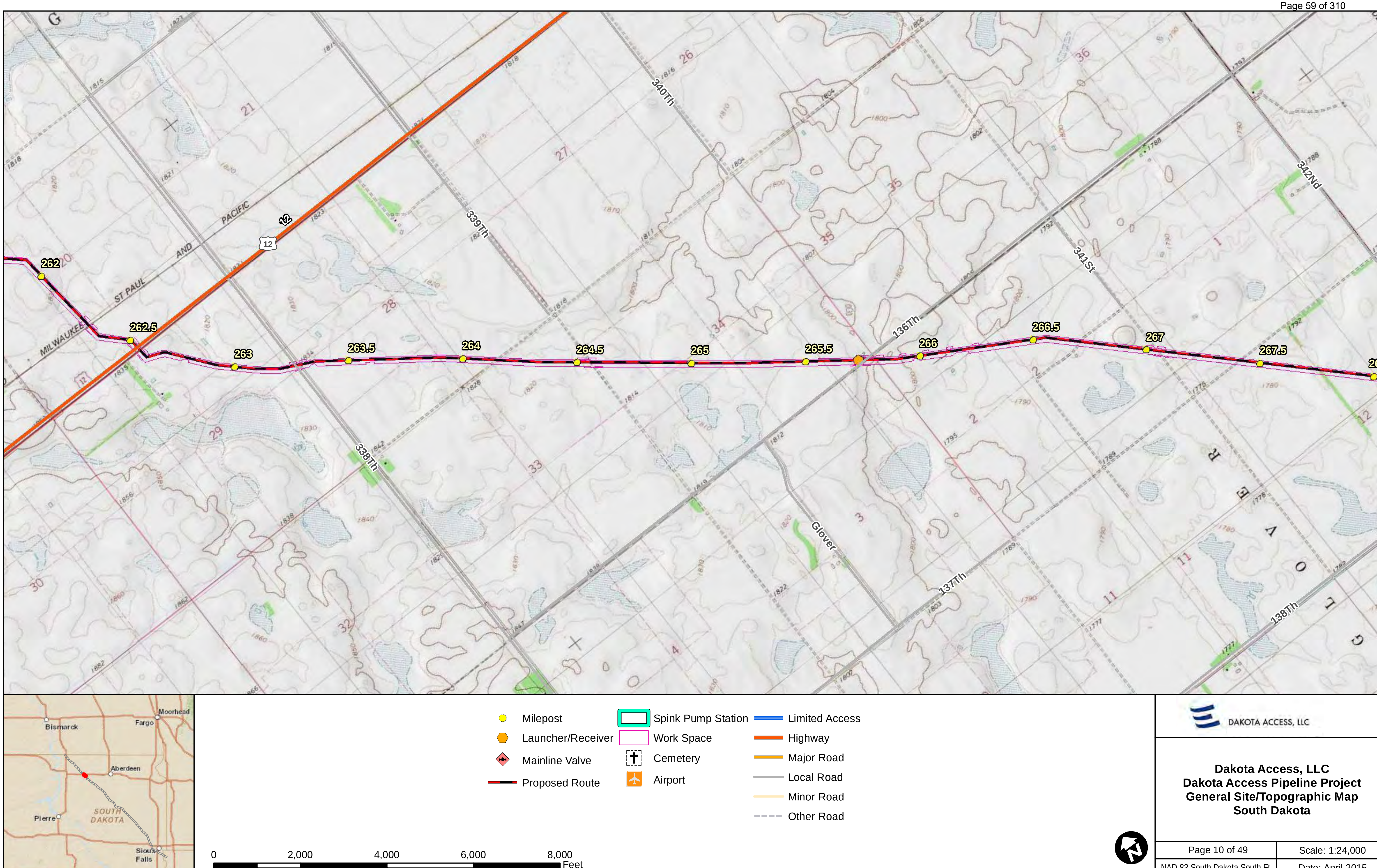
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 9 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

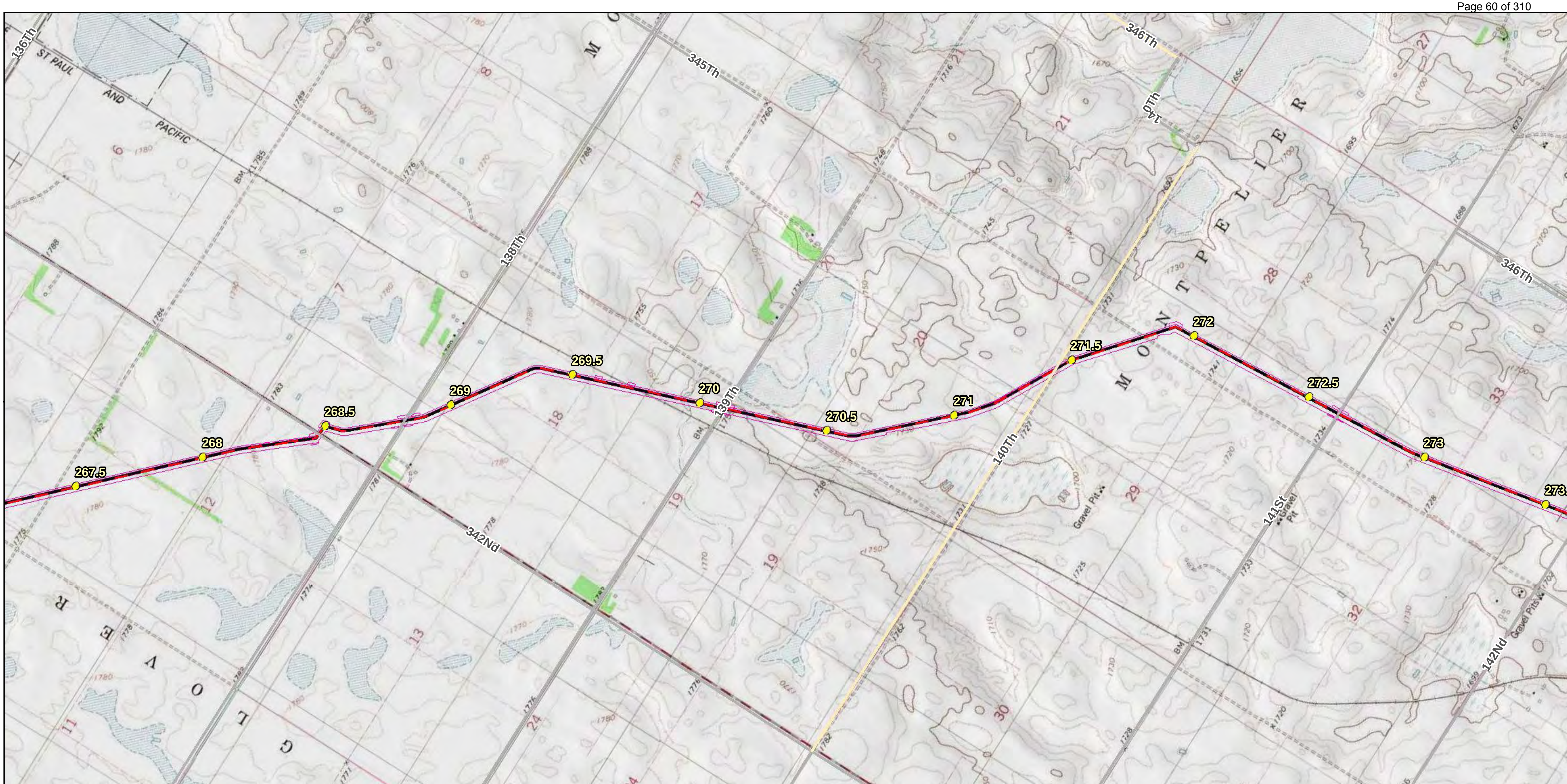
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 10 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

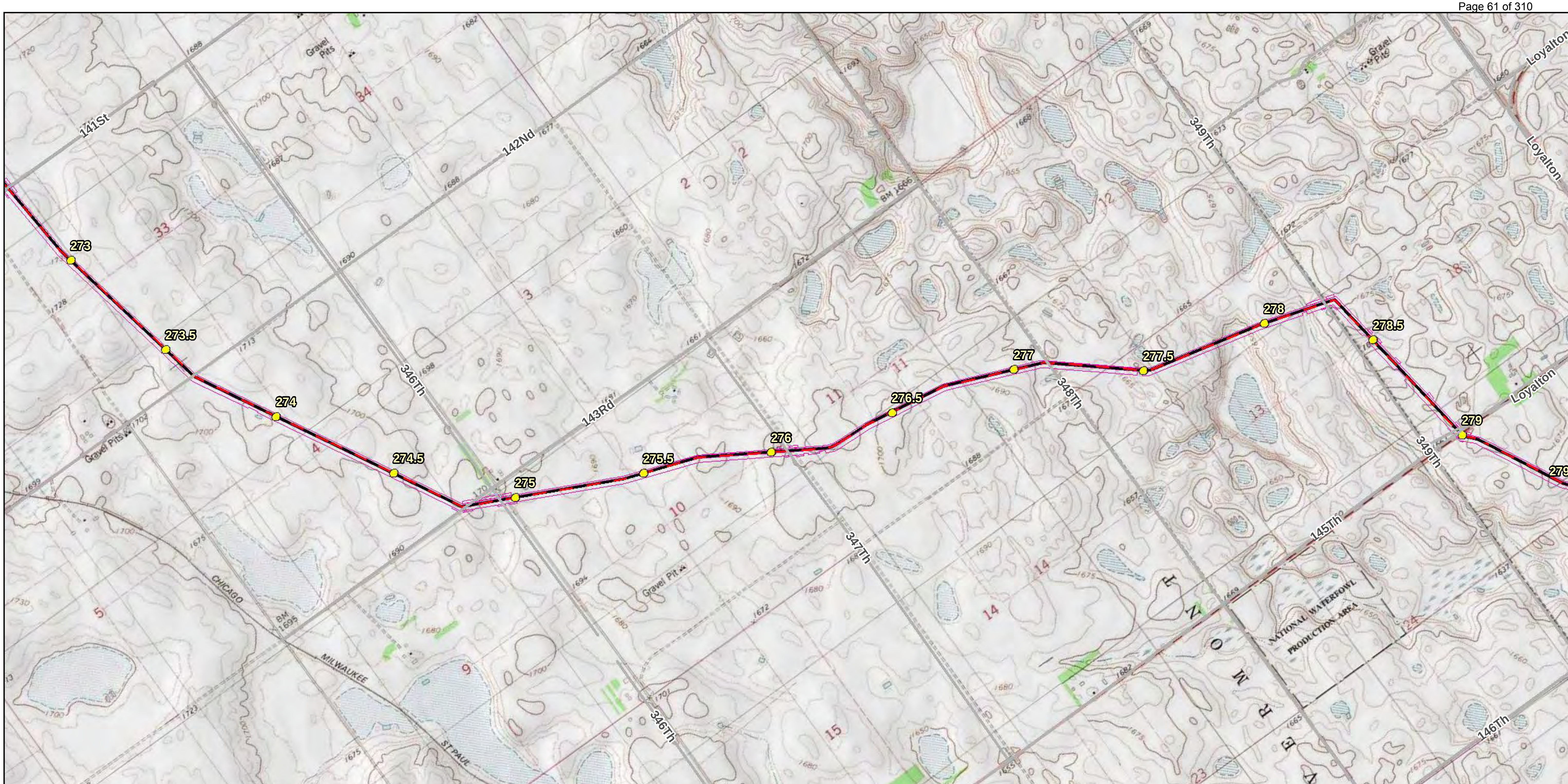
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 11 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 12 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd

Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

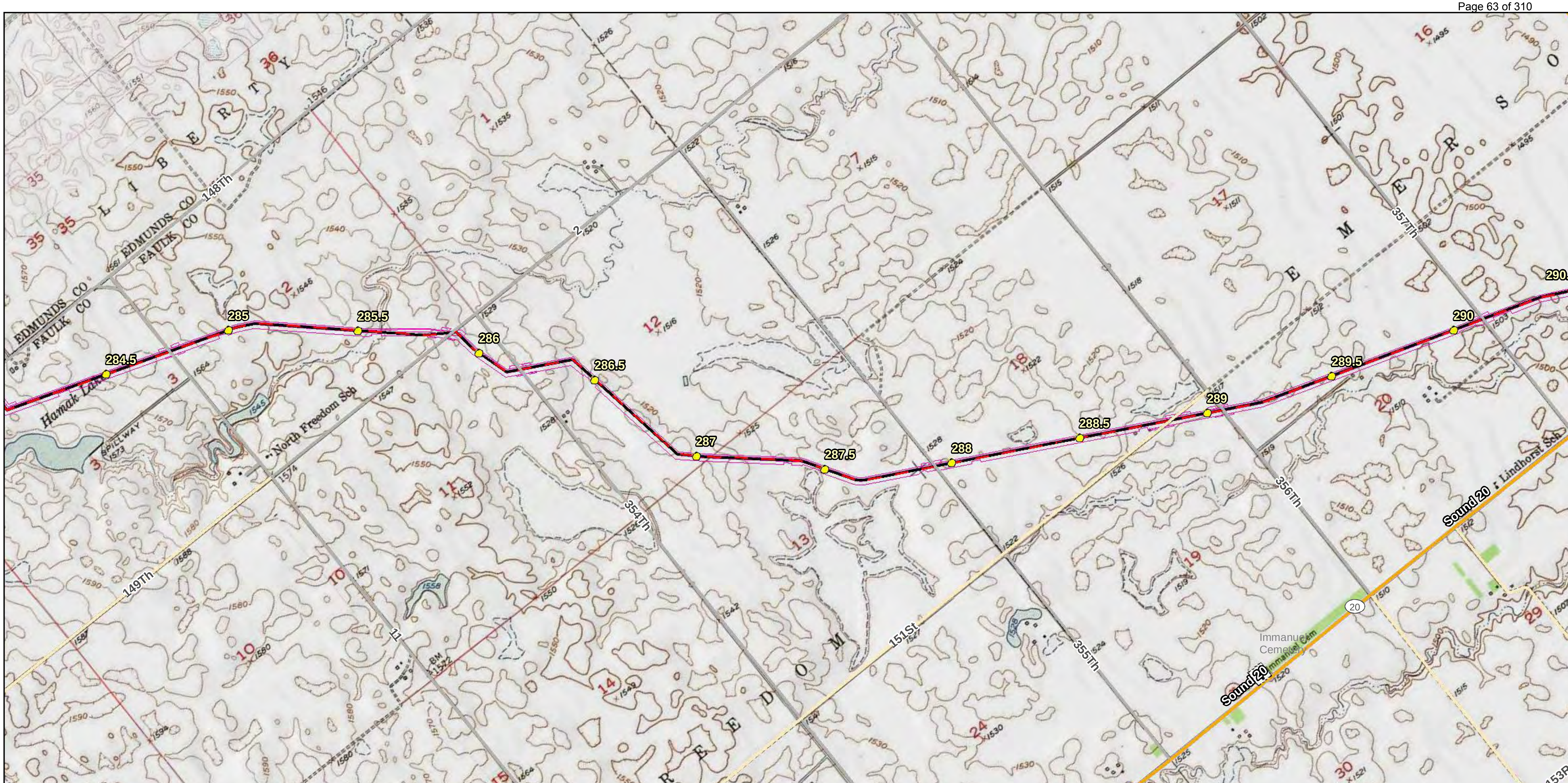
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 13 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

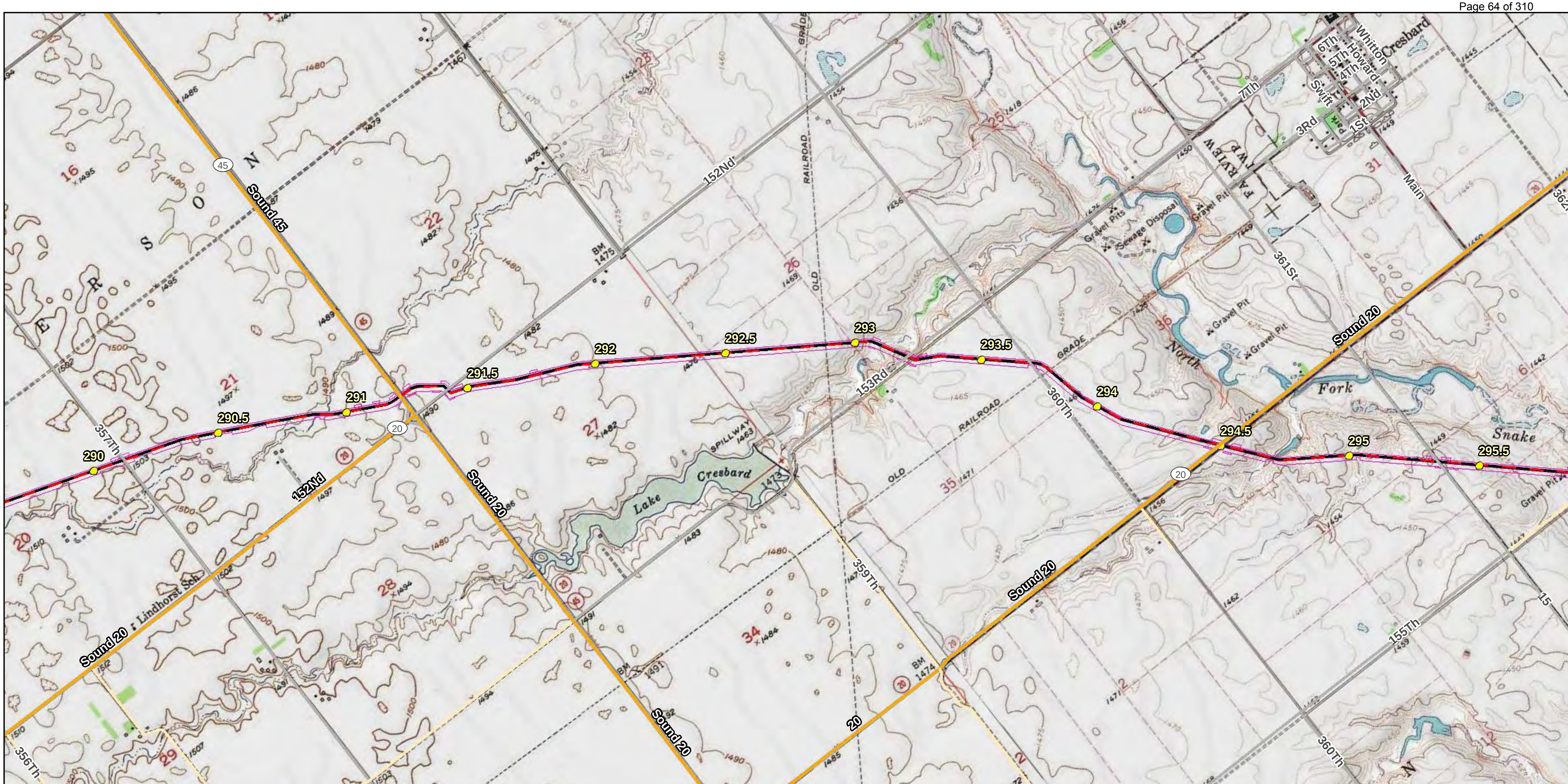
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 14 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

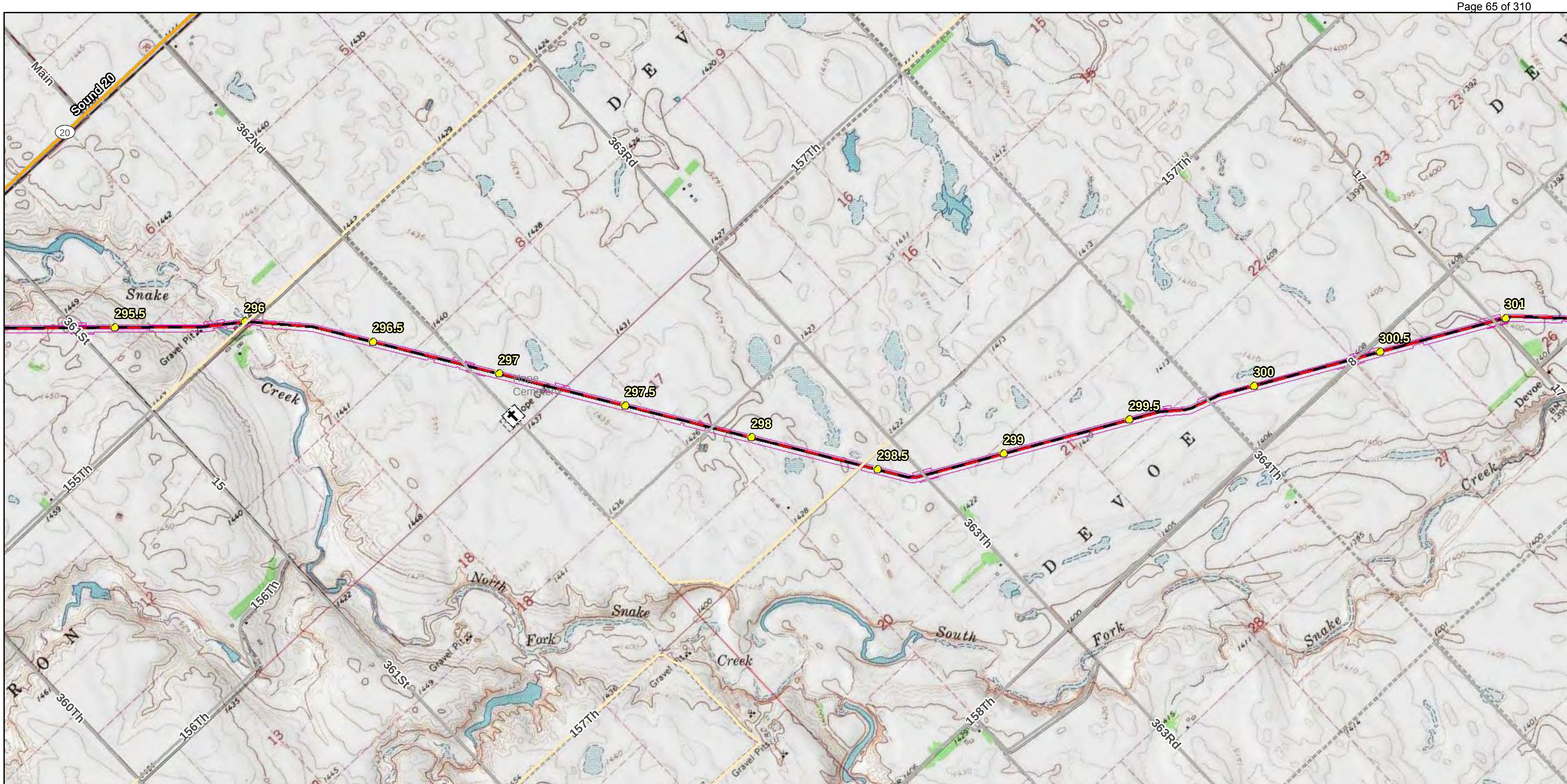
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 15 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

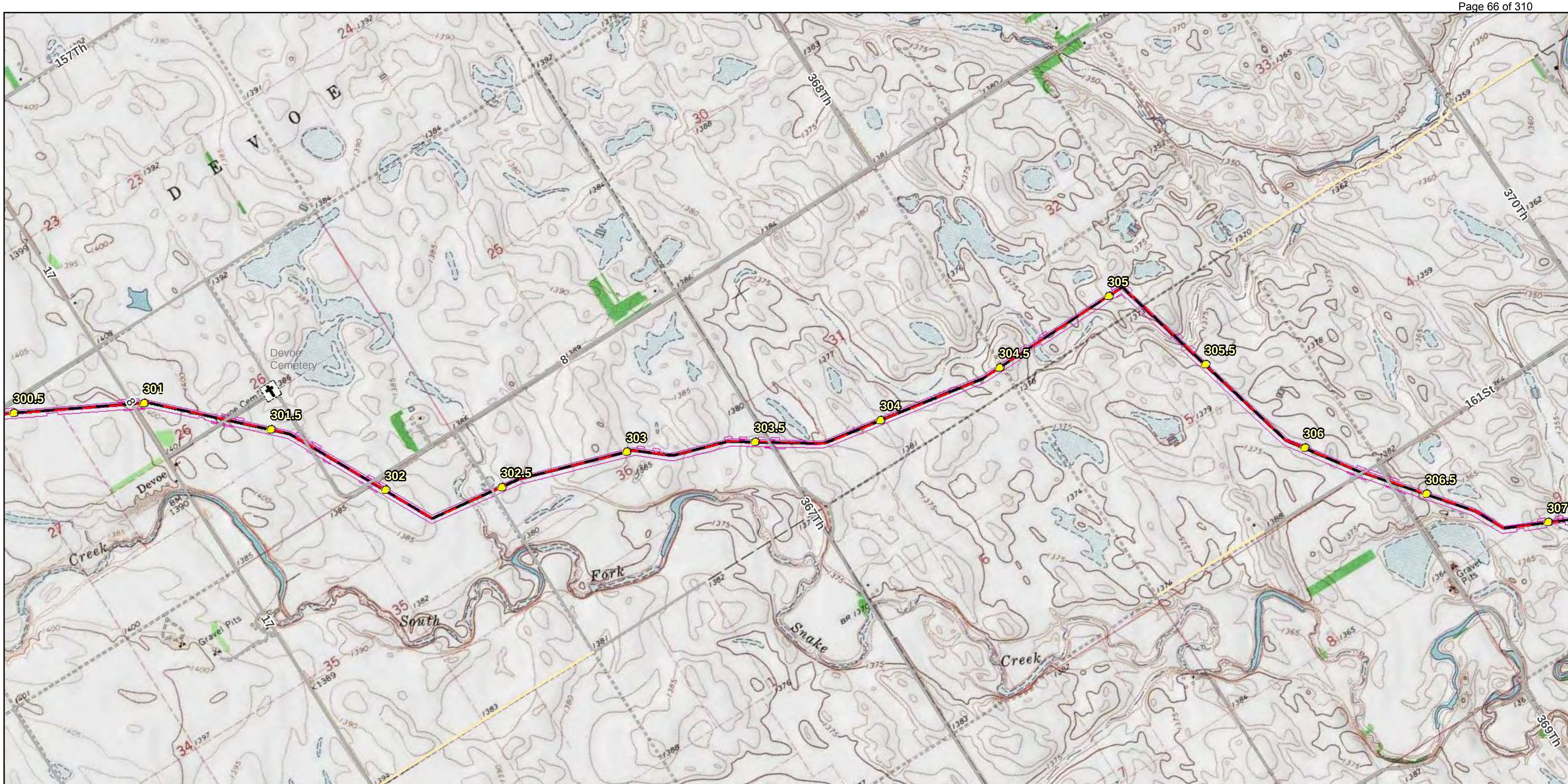
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 16 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



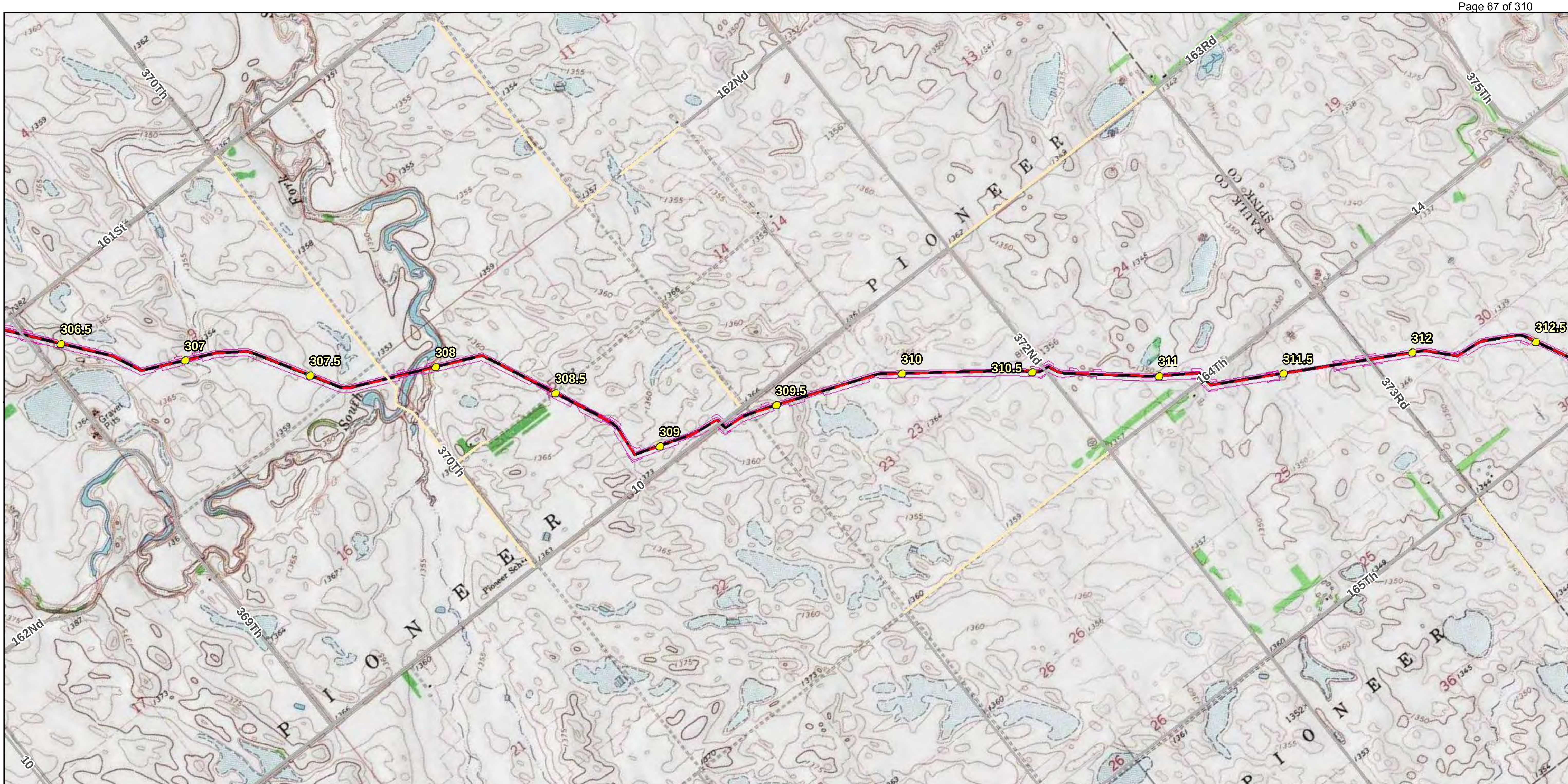
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 17 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

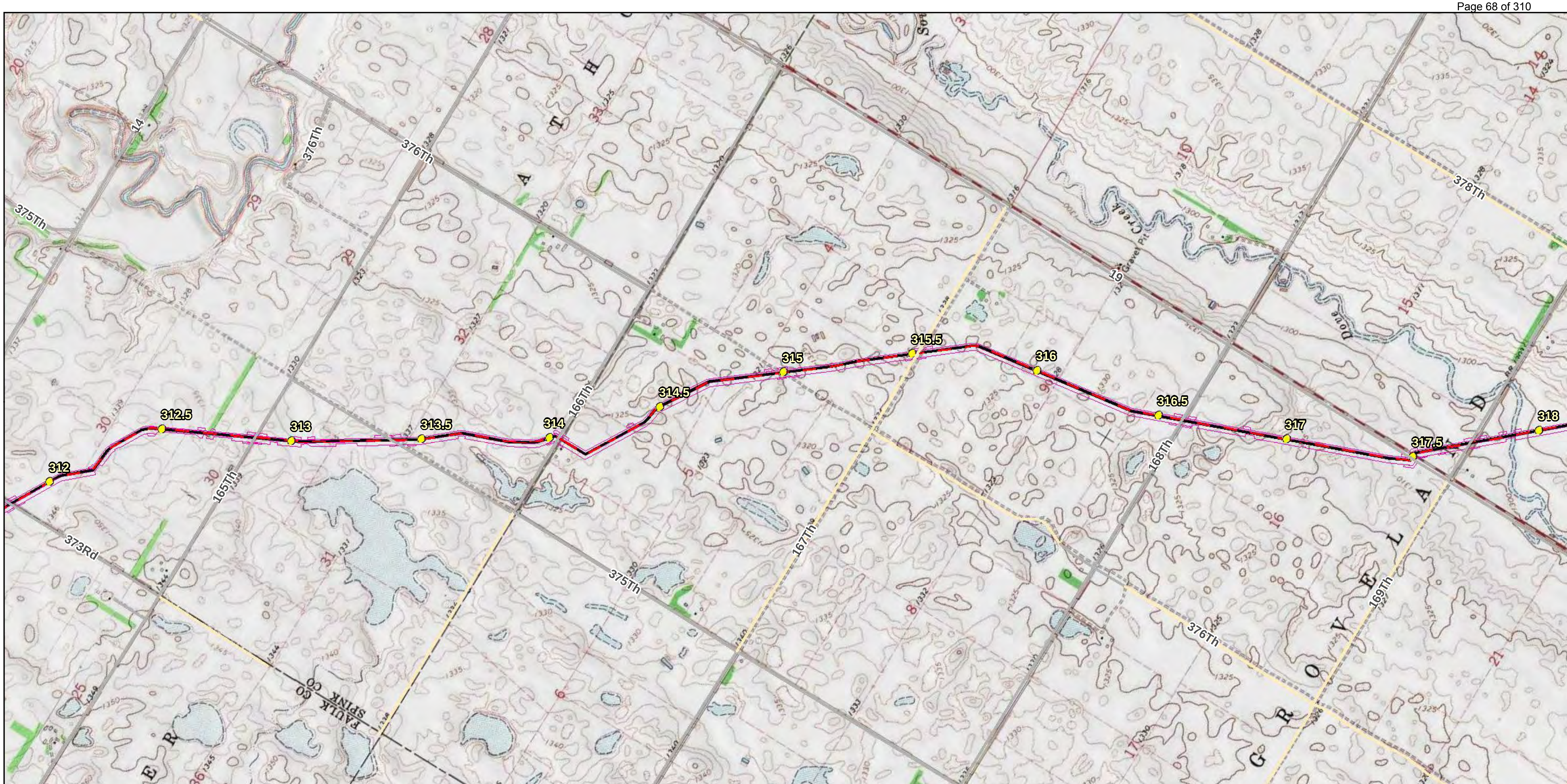
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 18 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

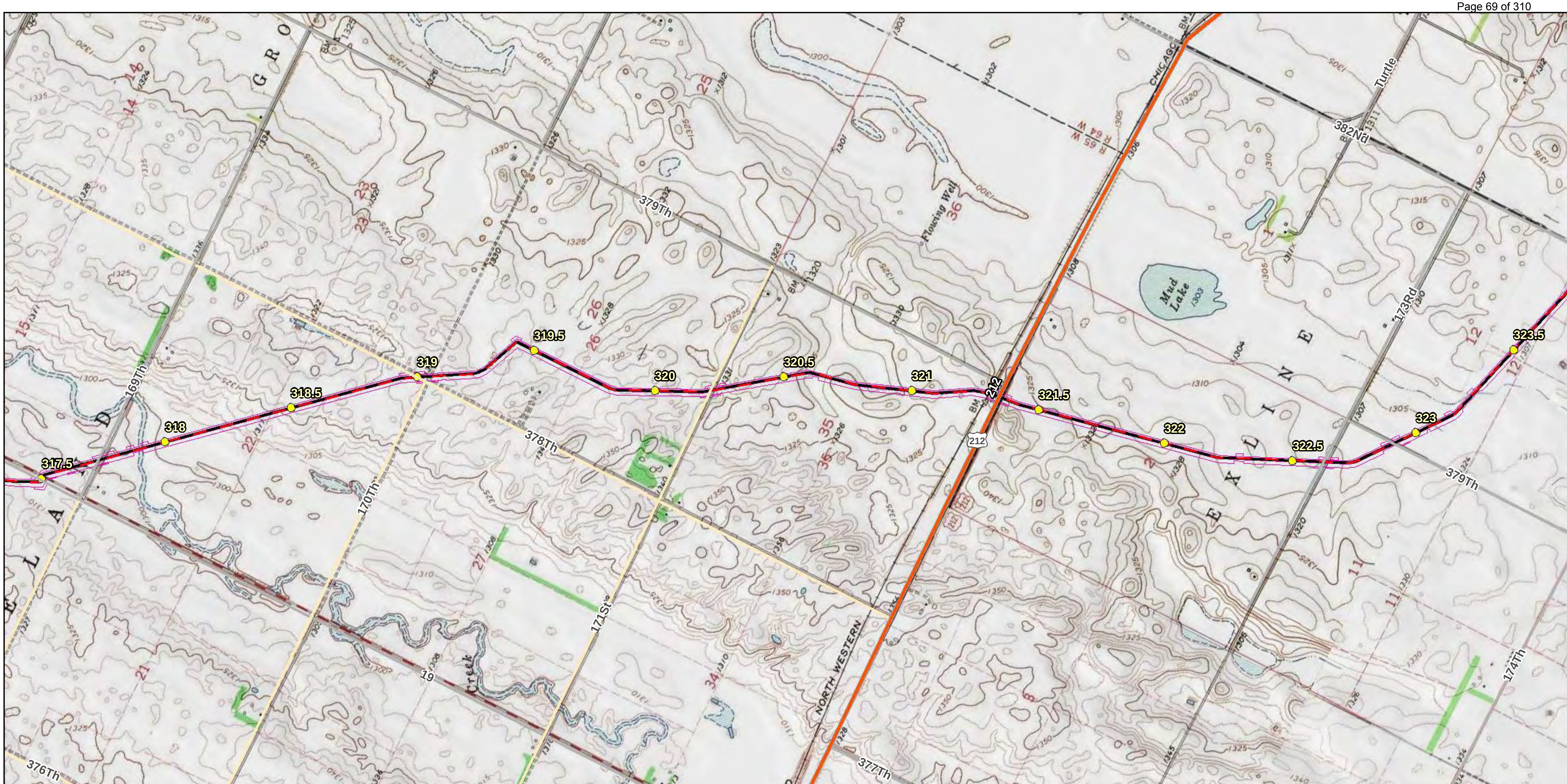
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 19 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

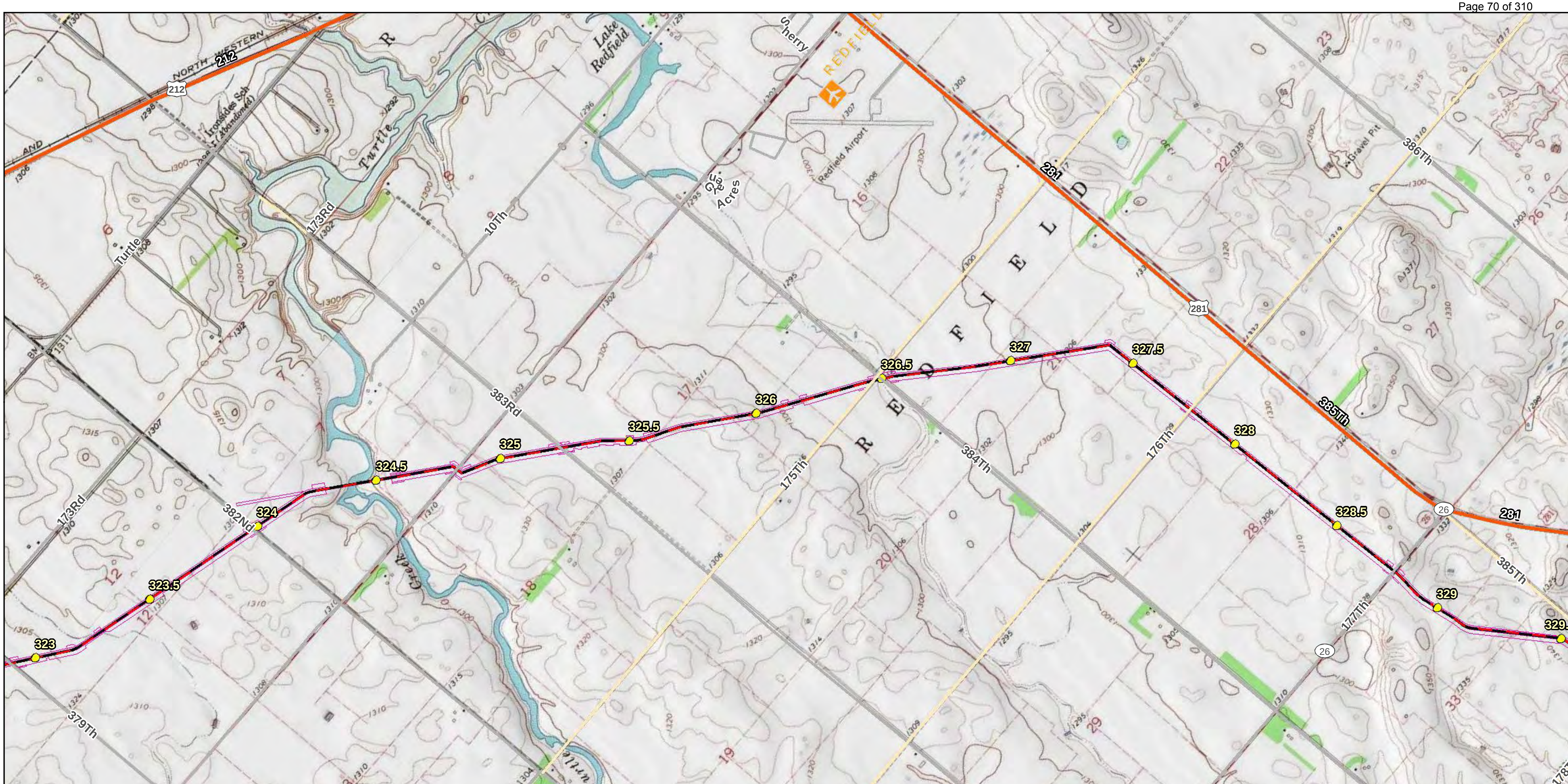
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 20 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

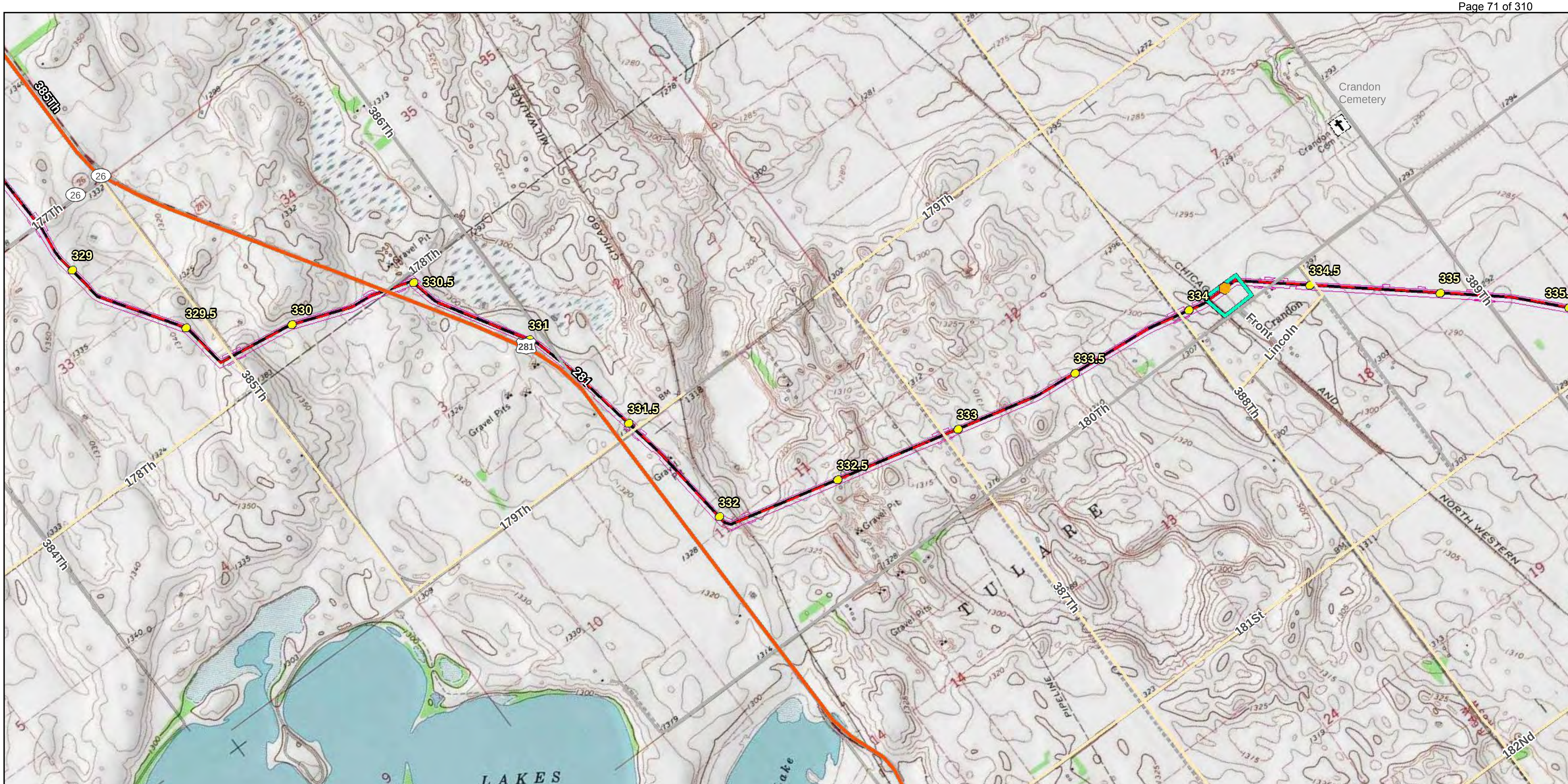
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 21 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

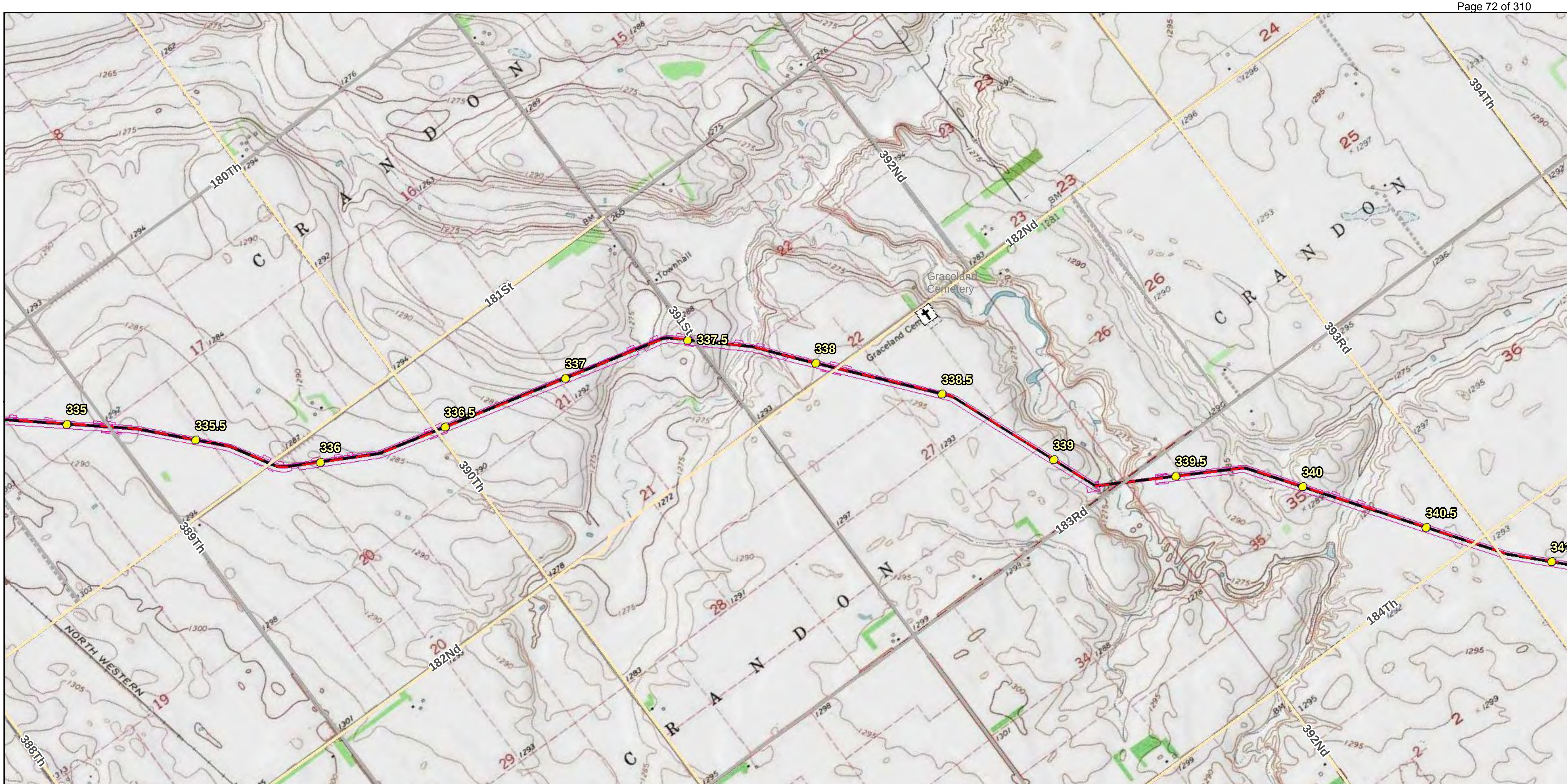
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 22 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost	Spink Pump Station
Launcher/Receiver	Work Space
Mainline Valve	Cemetery
Proposed Route	Airport

Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

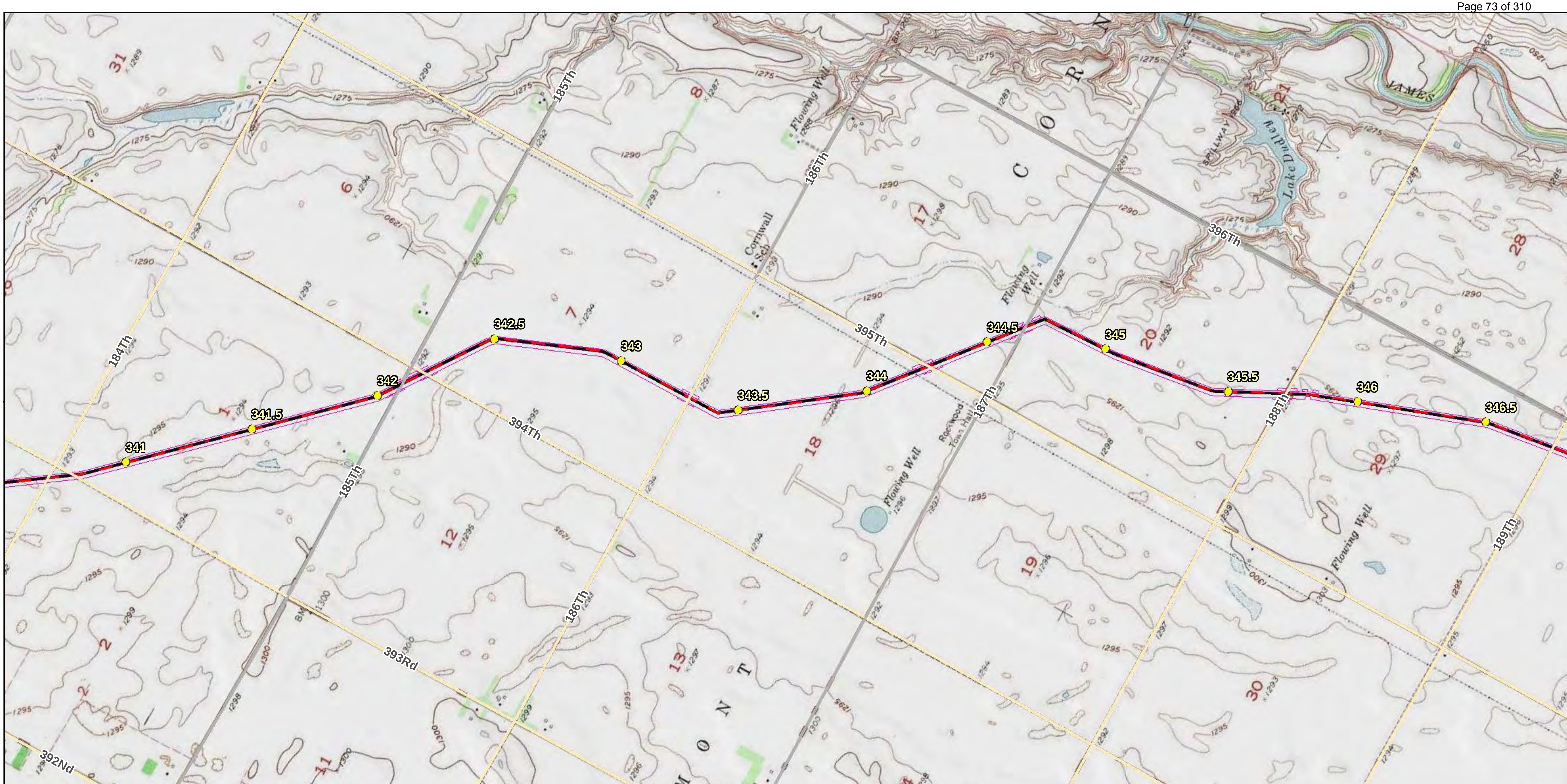
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 23 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



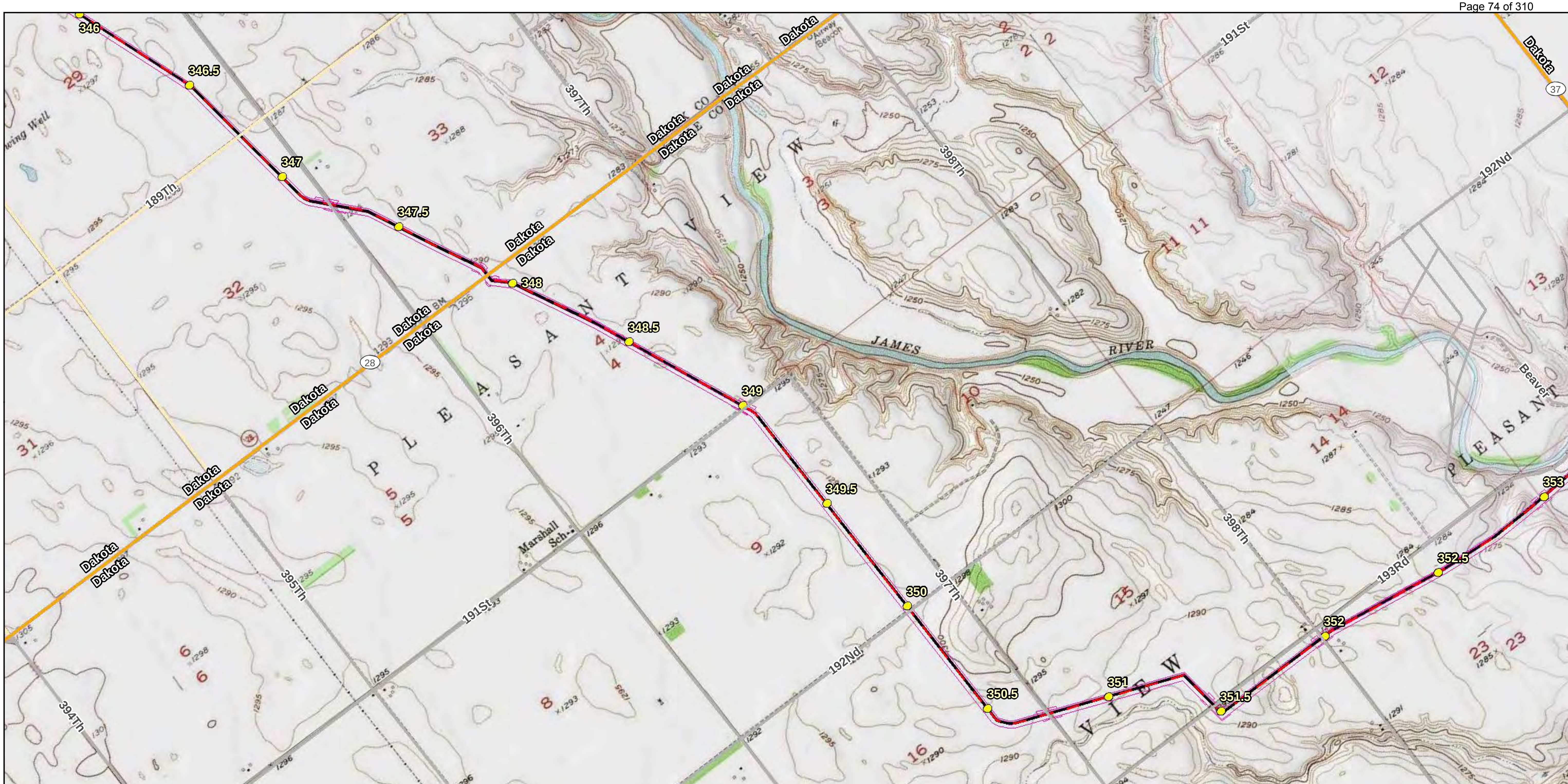
- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 24 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

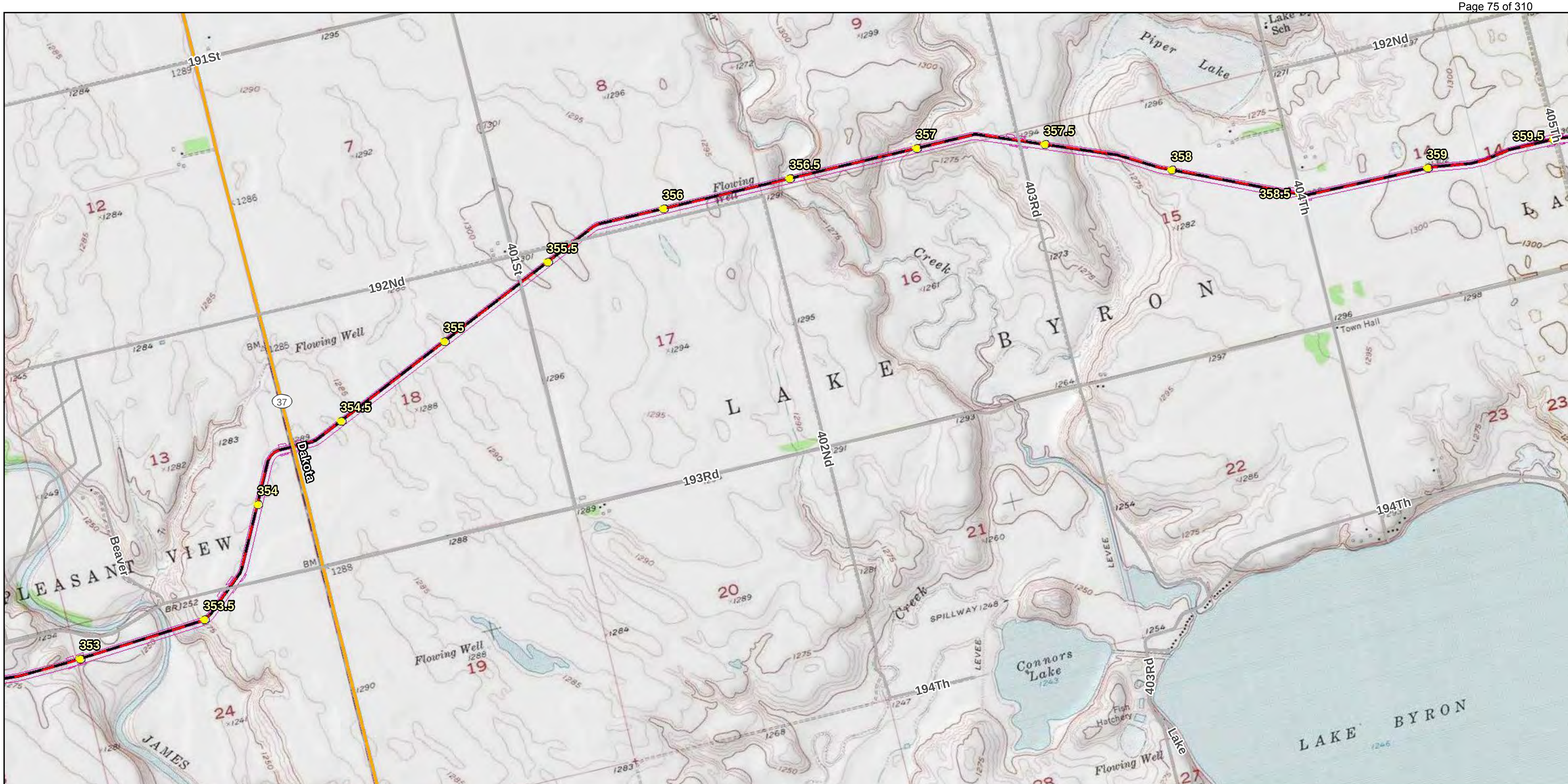
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 25 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

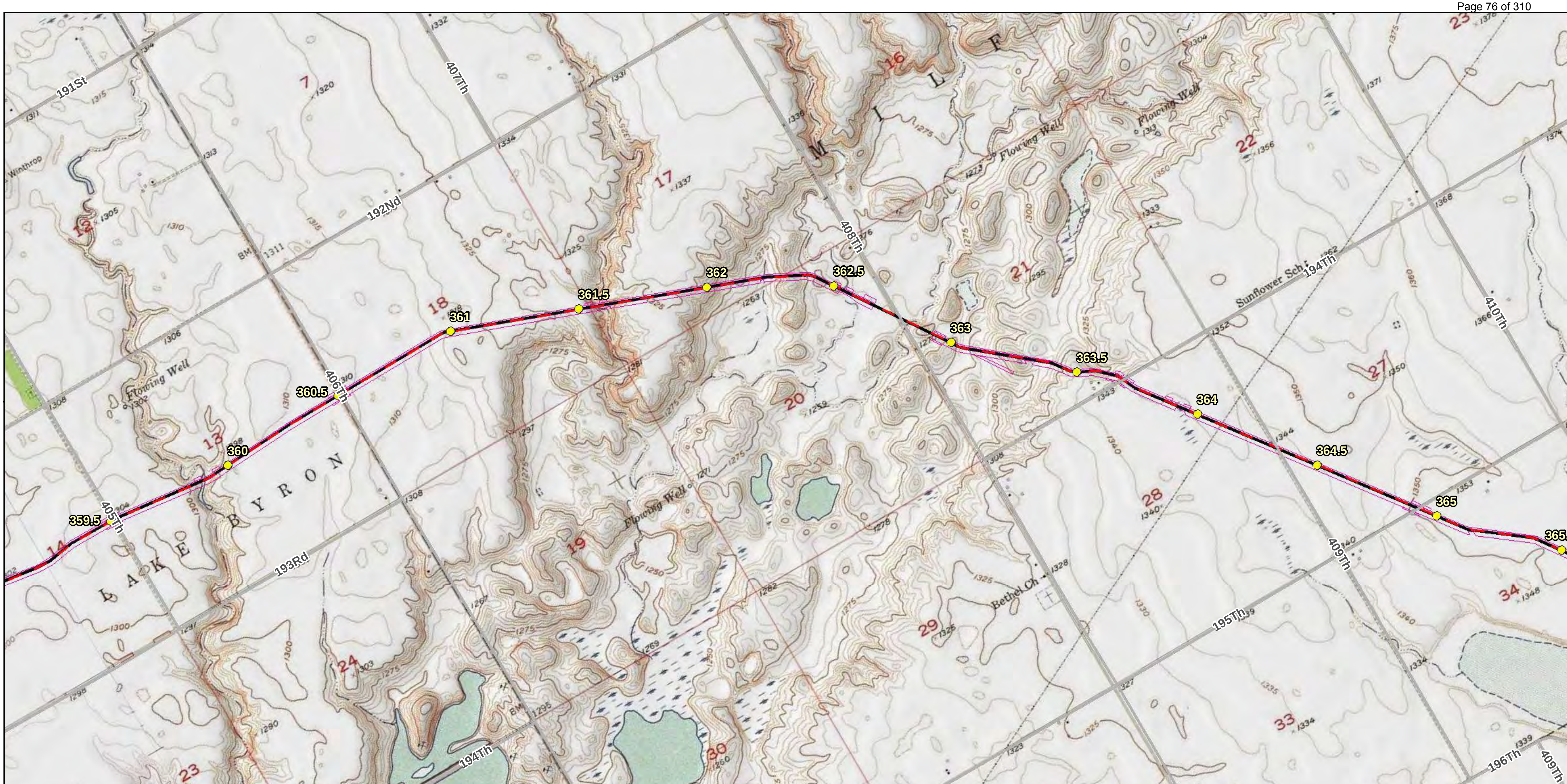
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 26 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

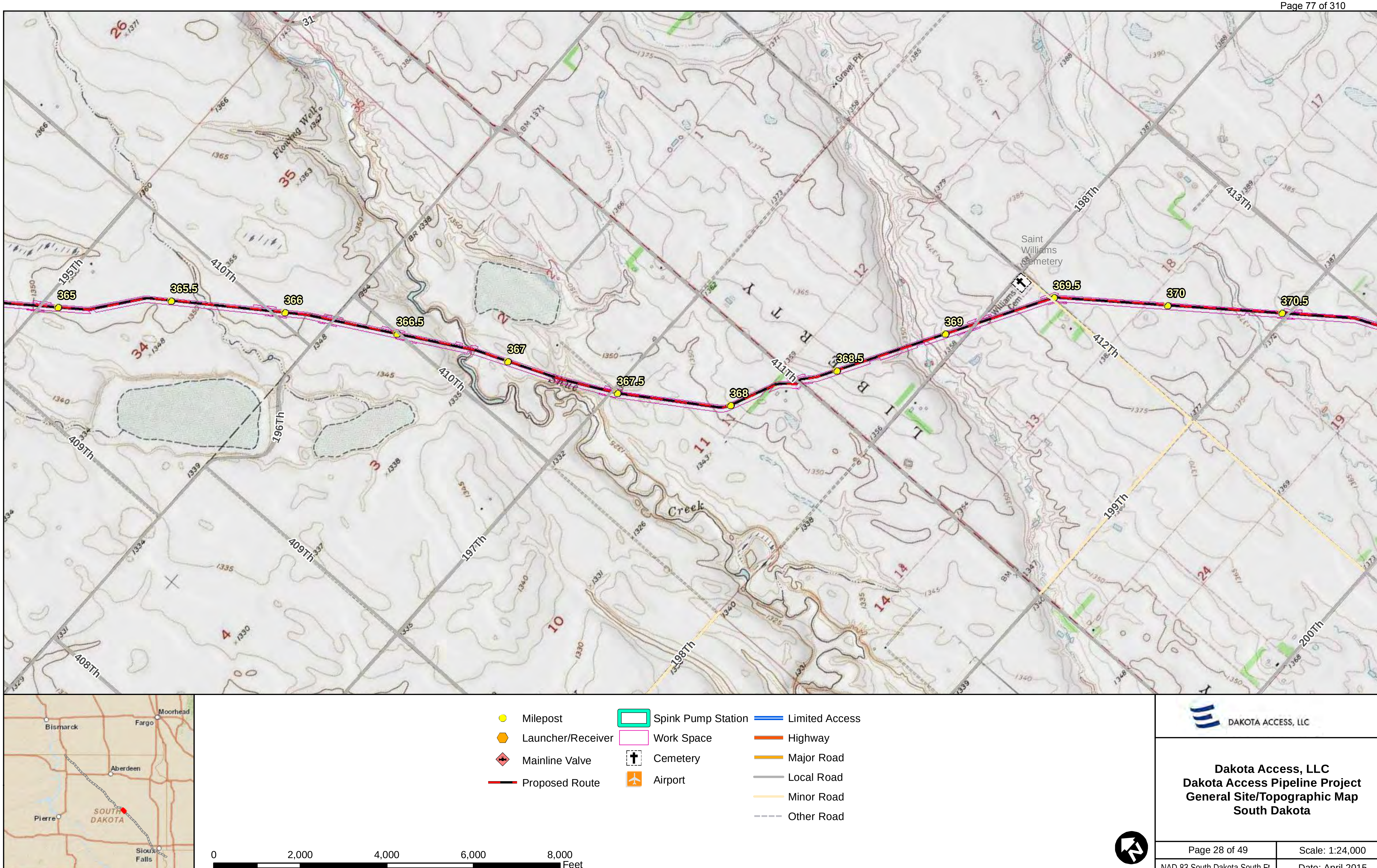
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 27 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



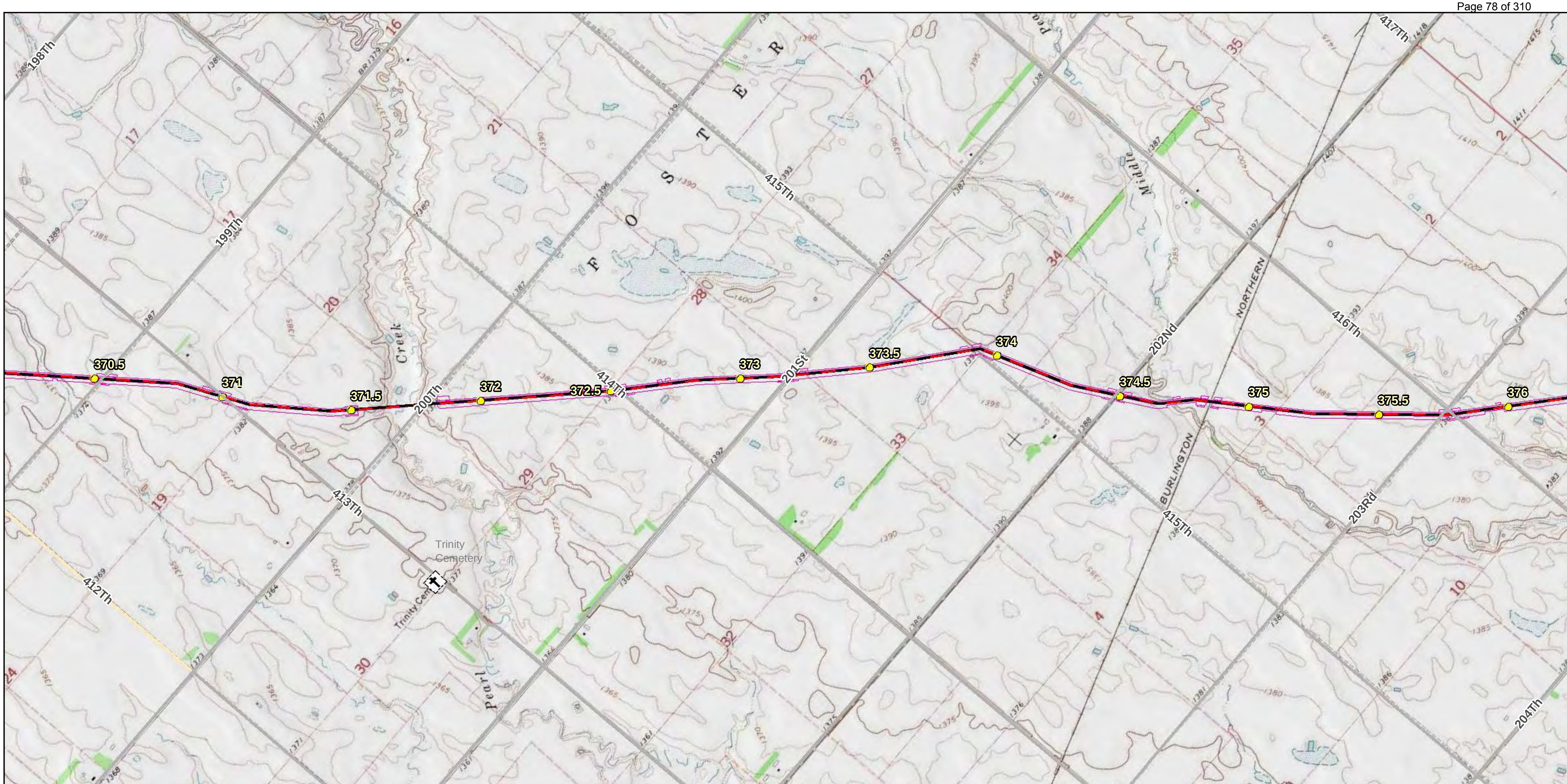
- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 28 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

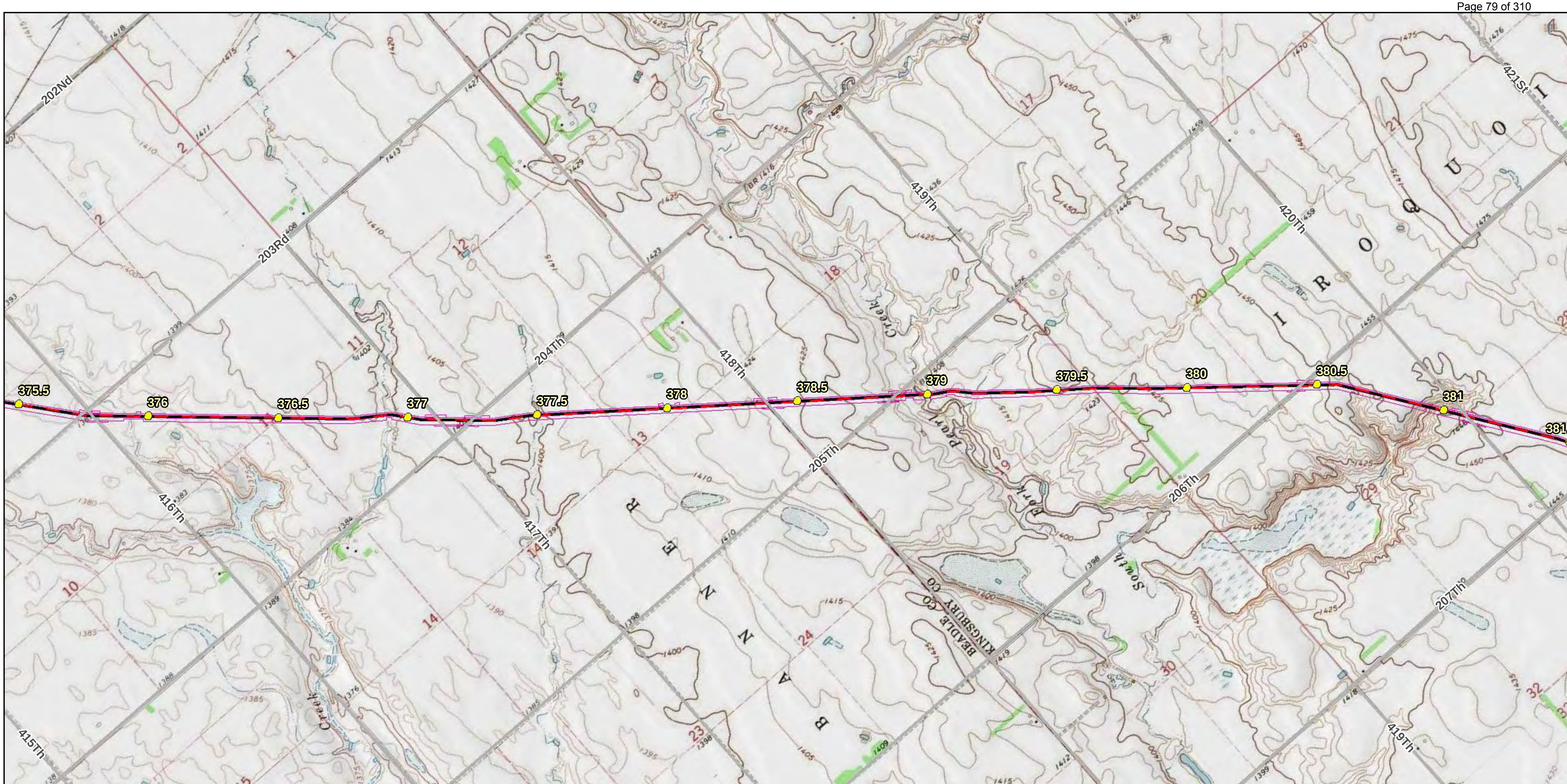
0 2,000 4,000 6,000 8,000 Feet

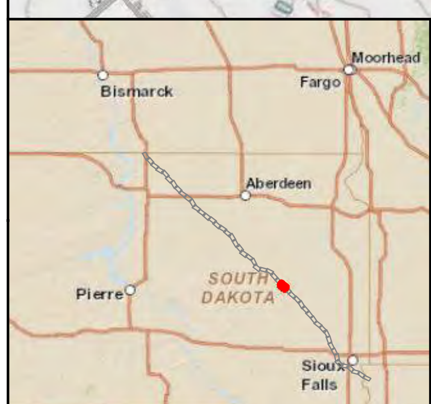
DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 29 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd





Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

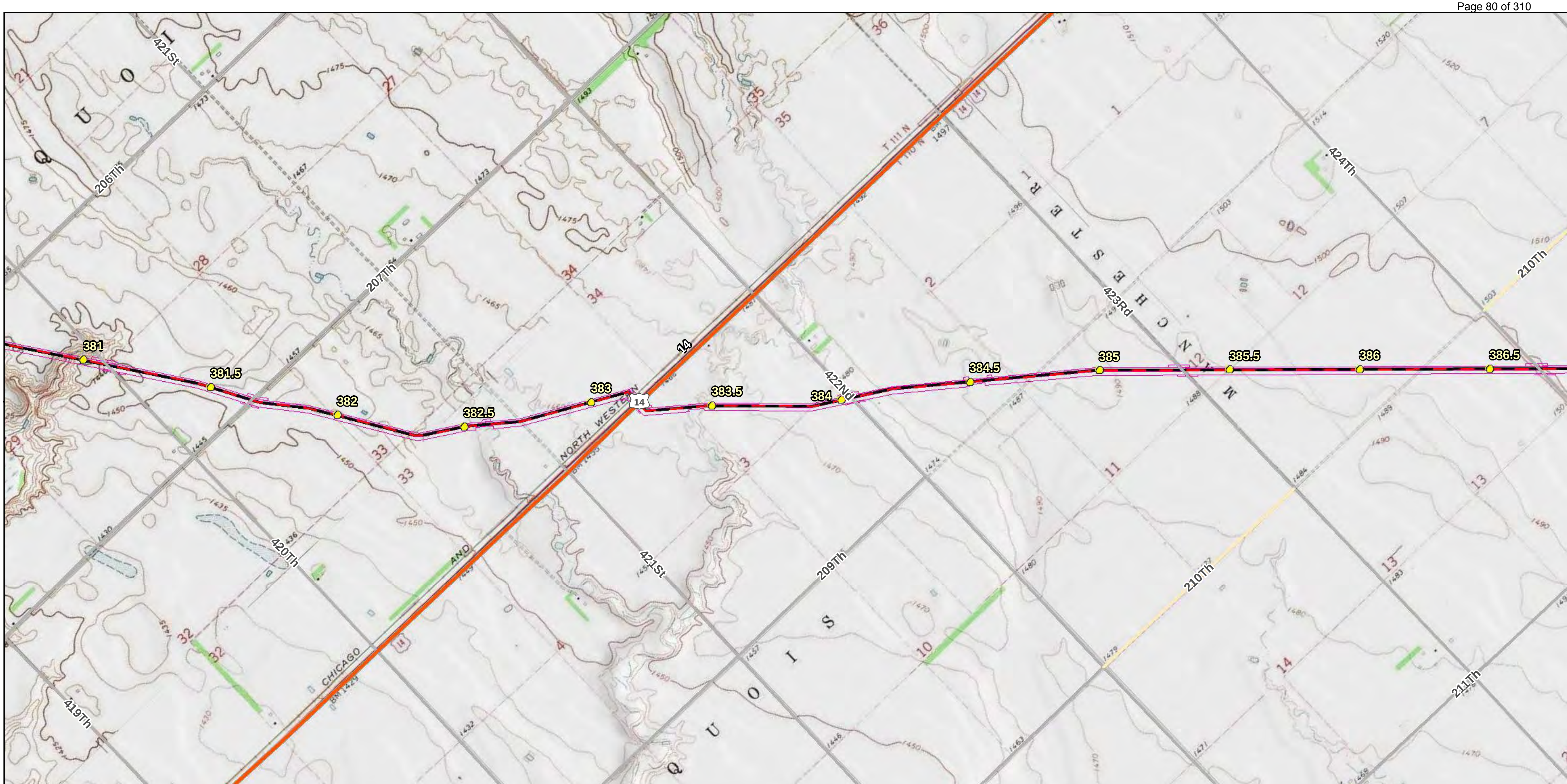
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 30 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



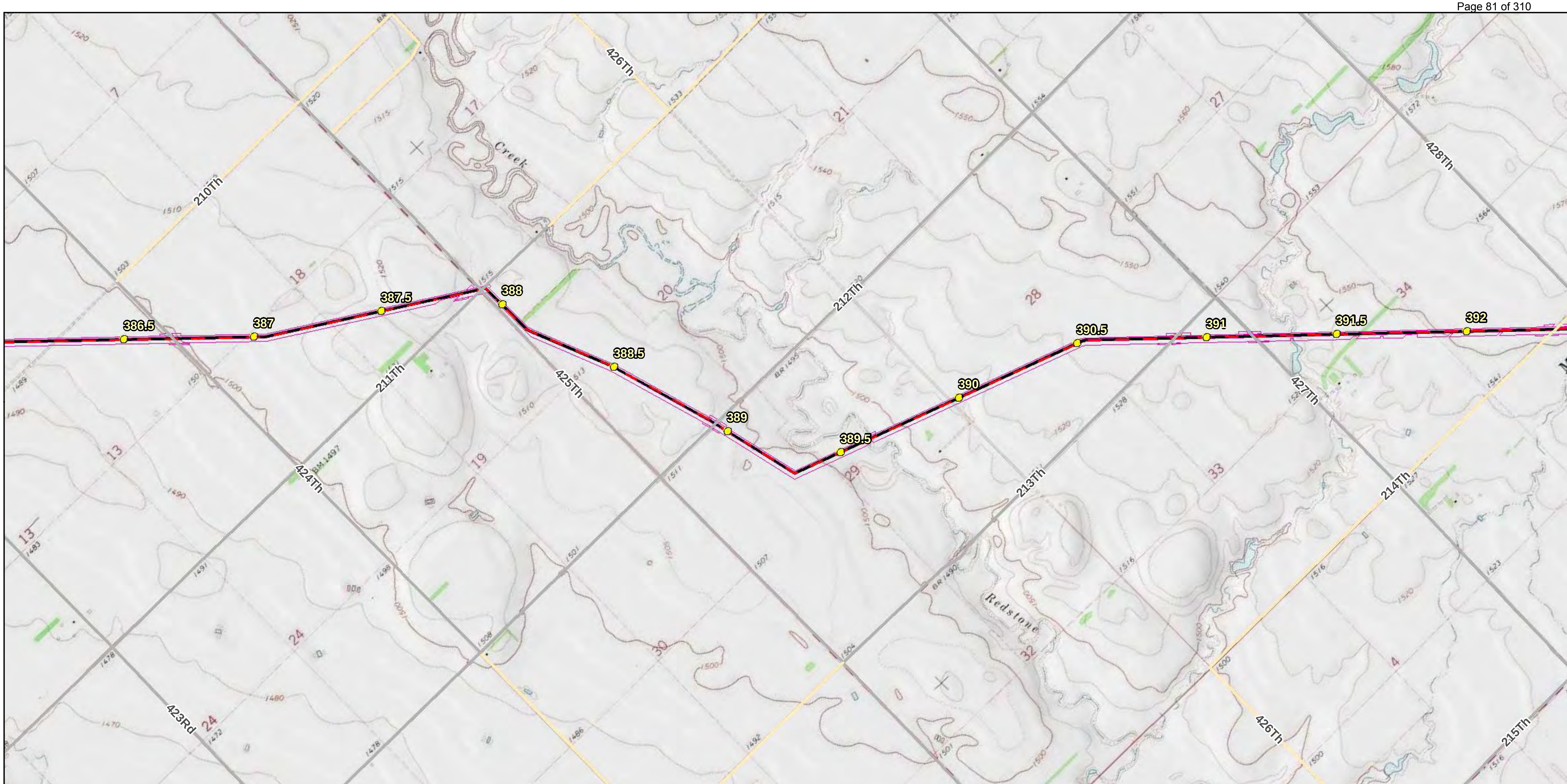
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 31 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



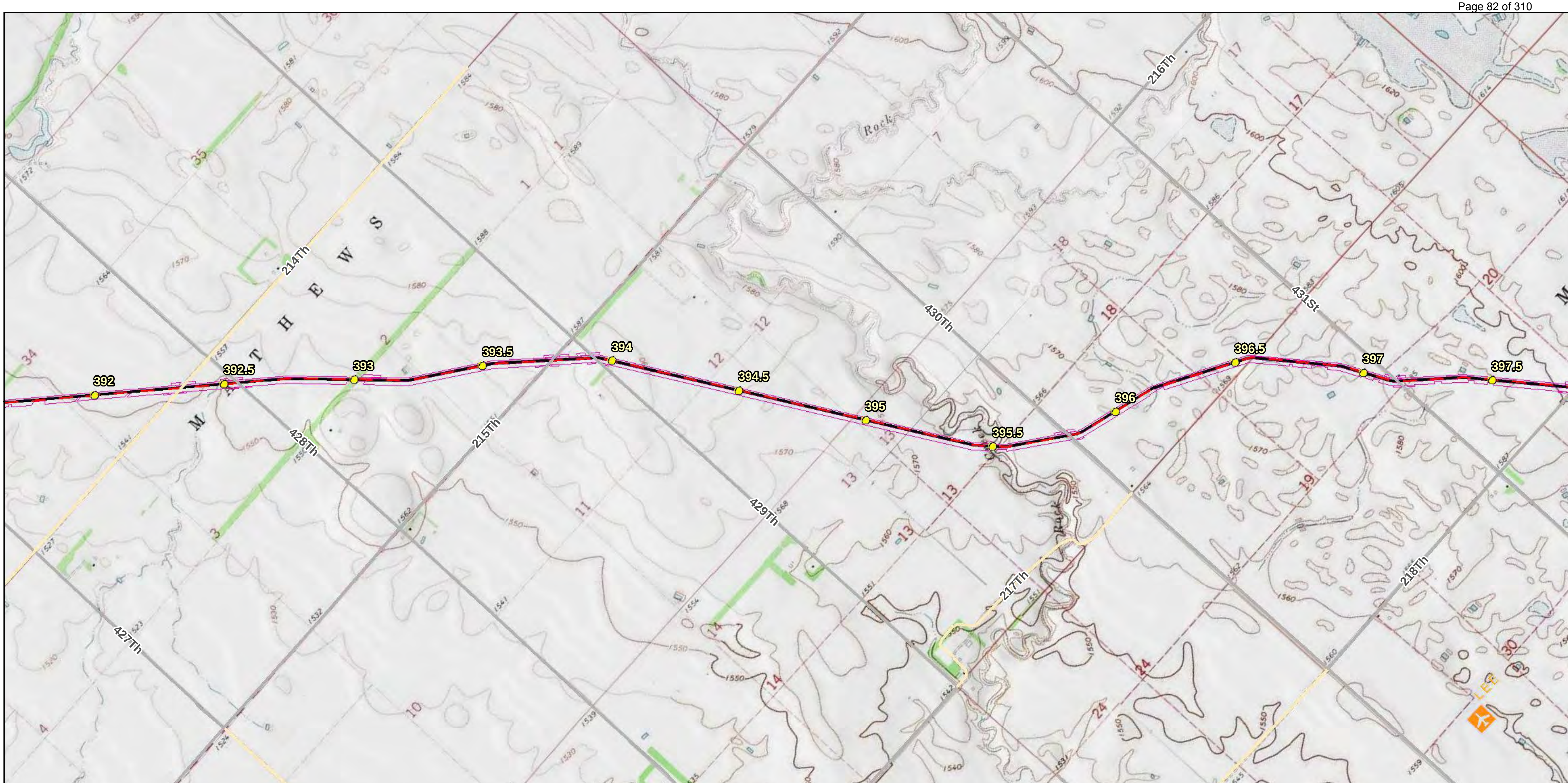
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 32 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



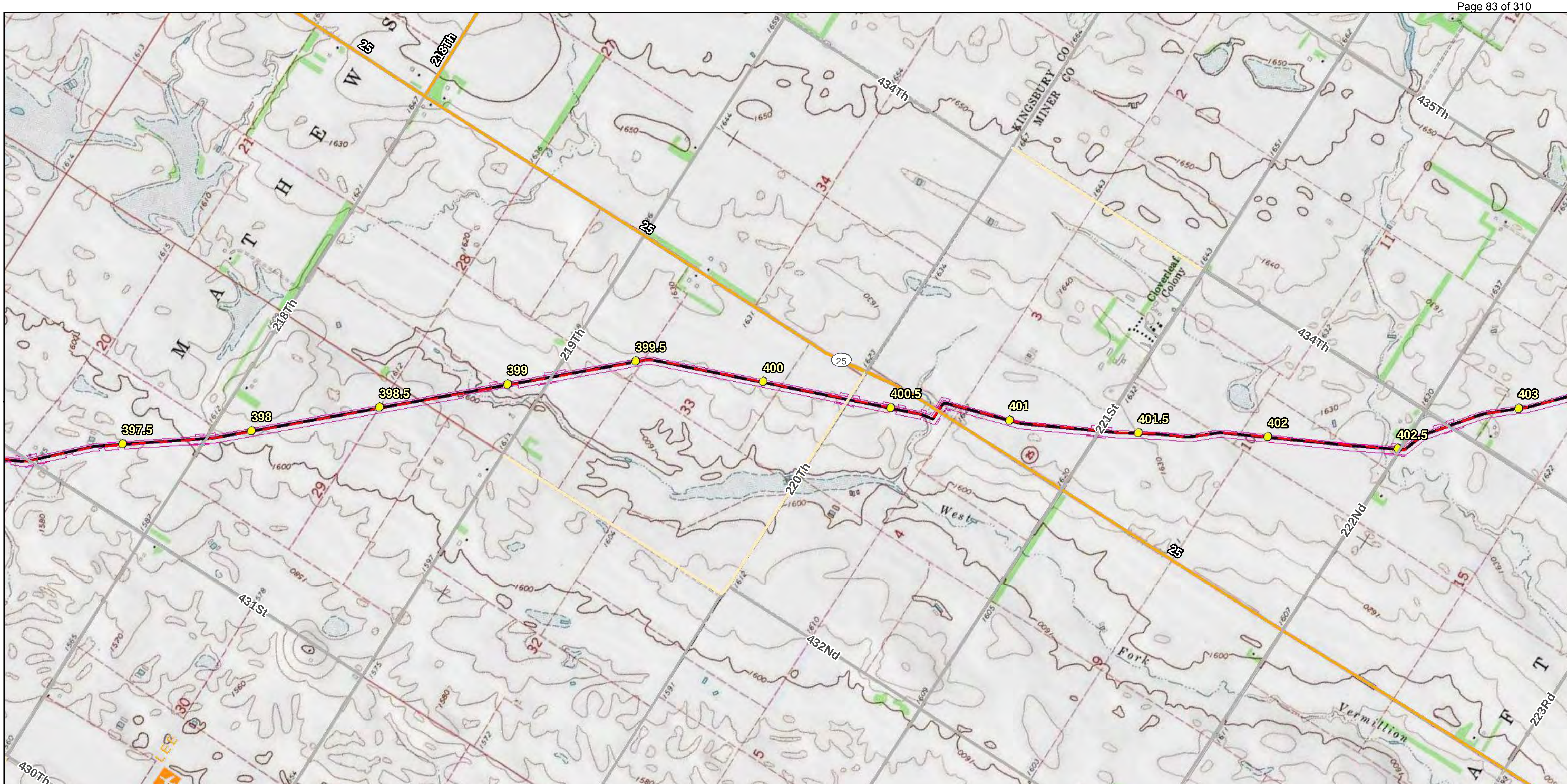
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 33 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 34 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd

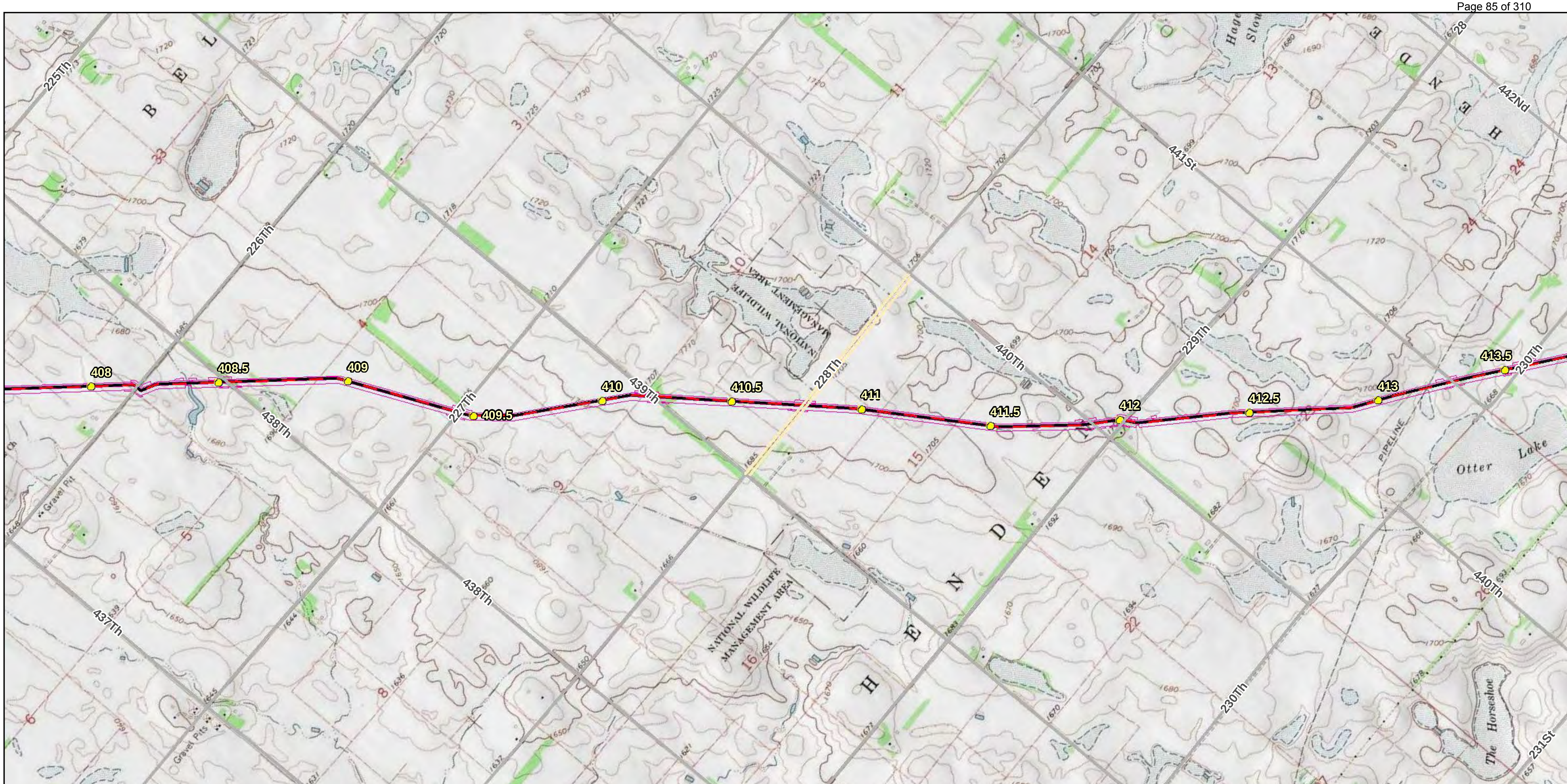
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 35 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

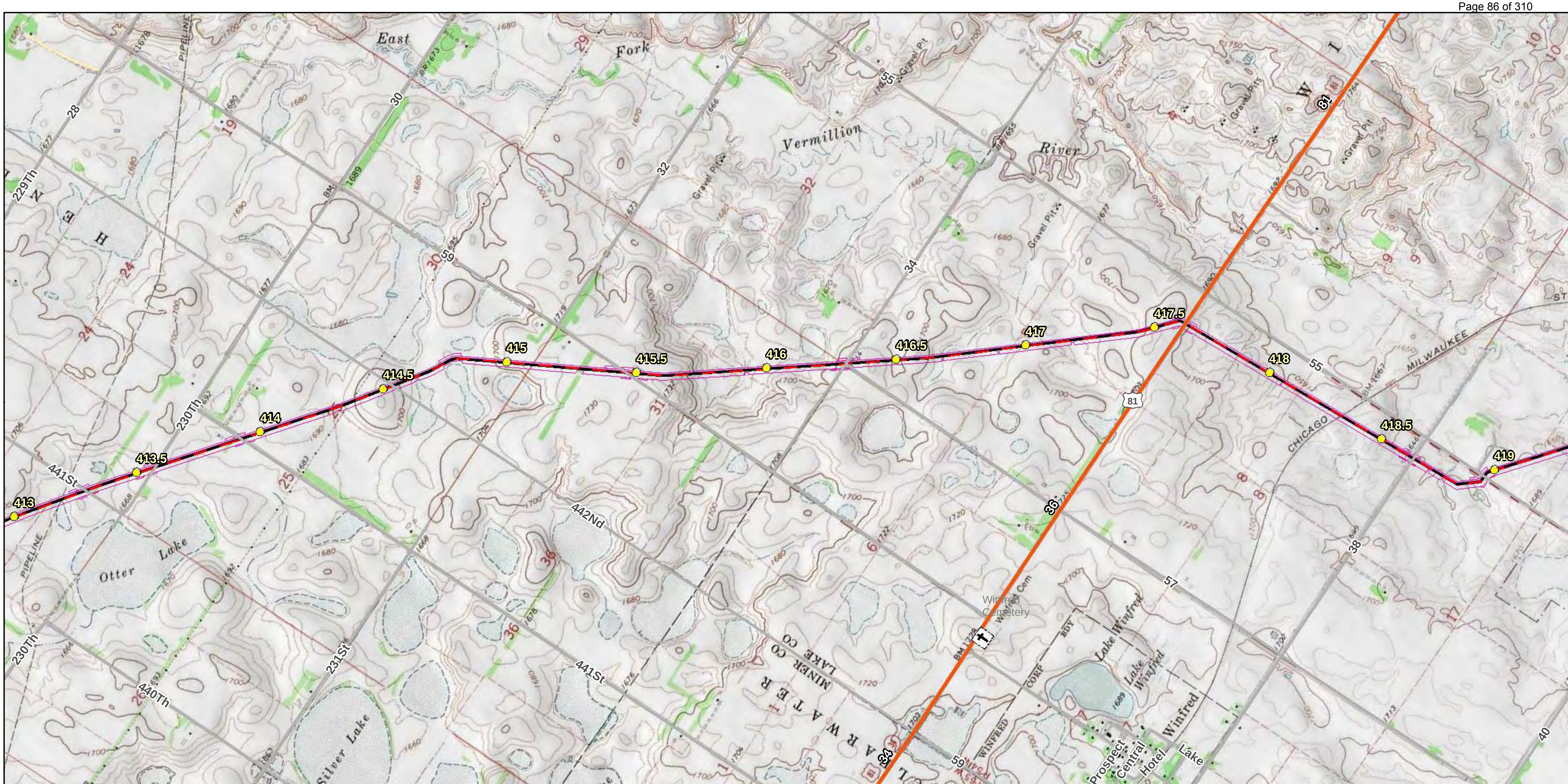
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 36 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



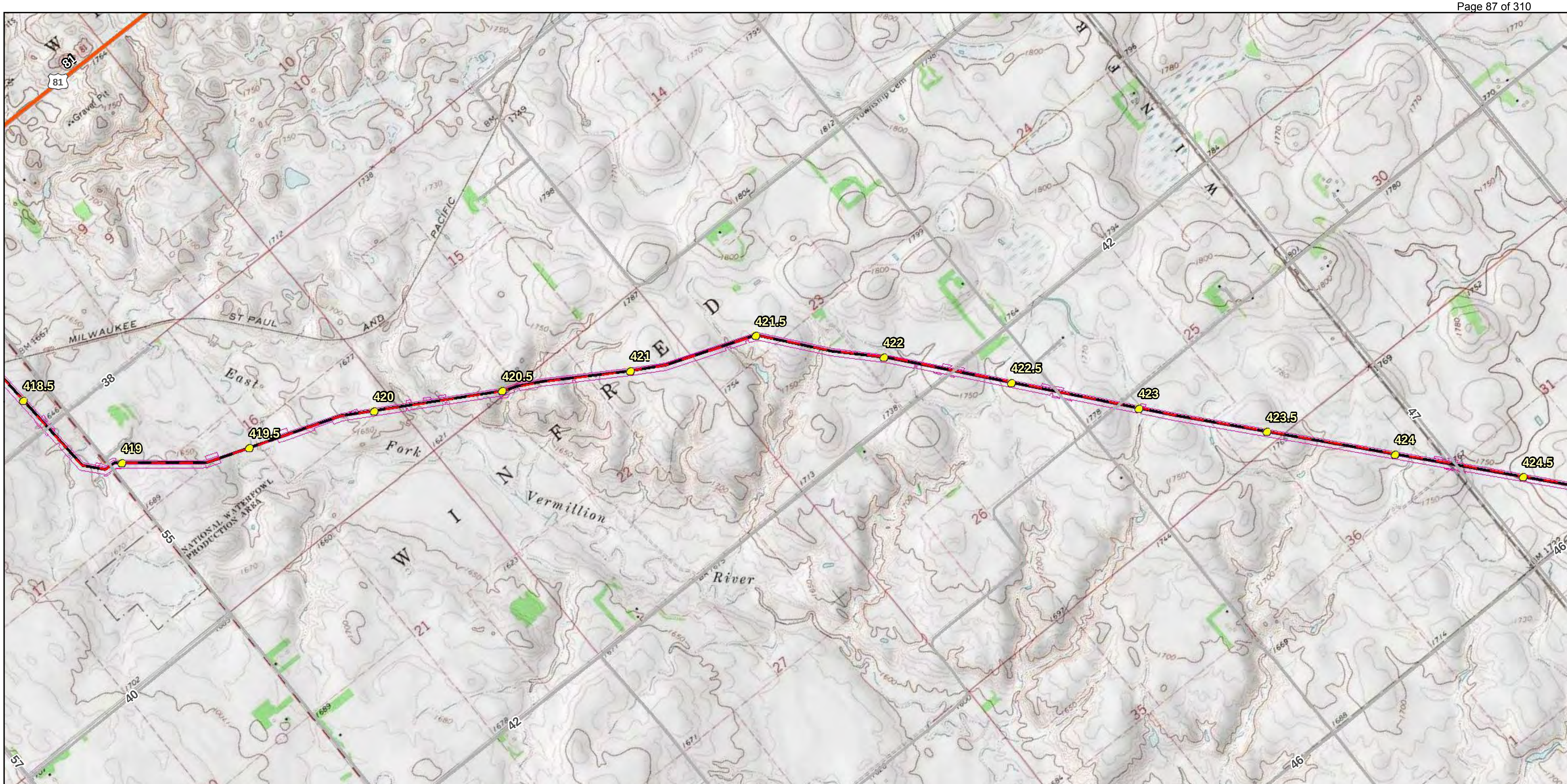
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 37 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



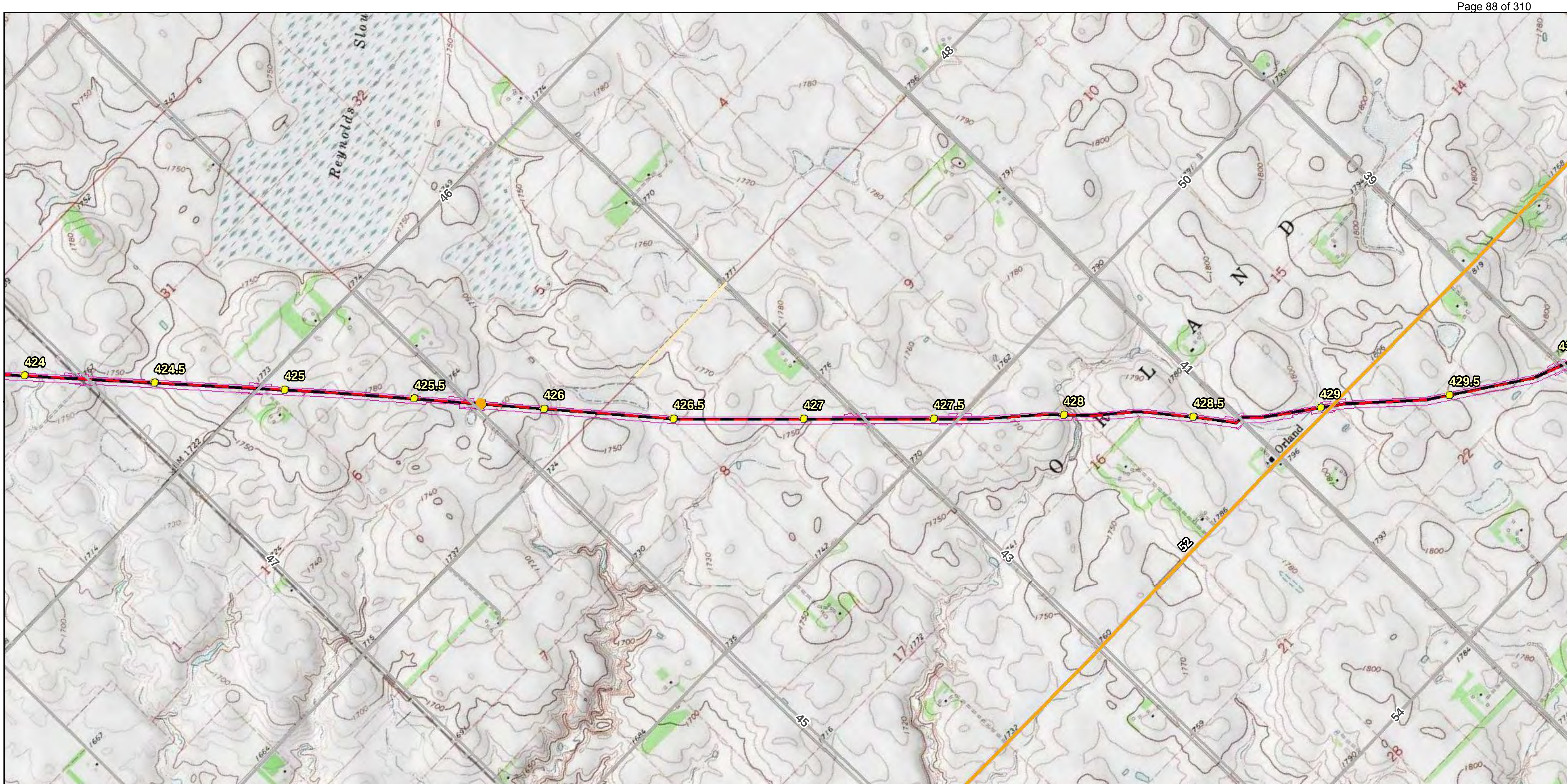
- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 38 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



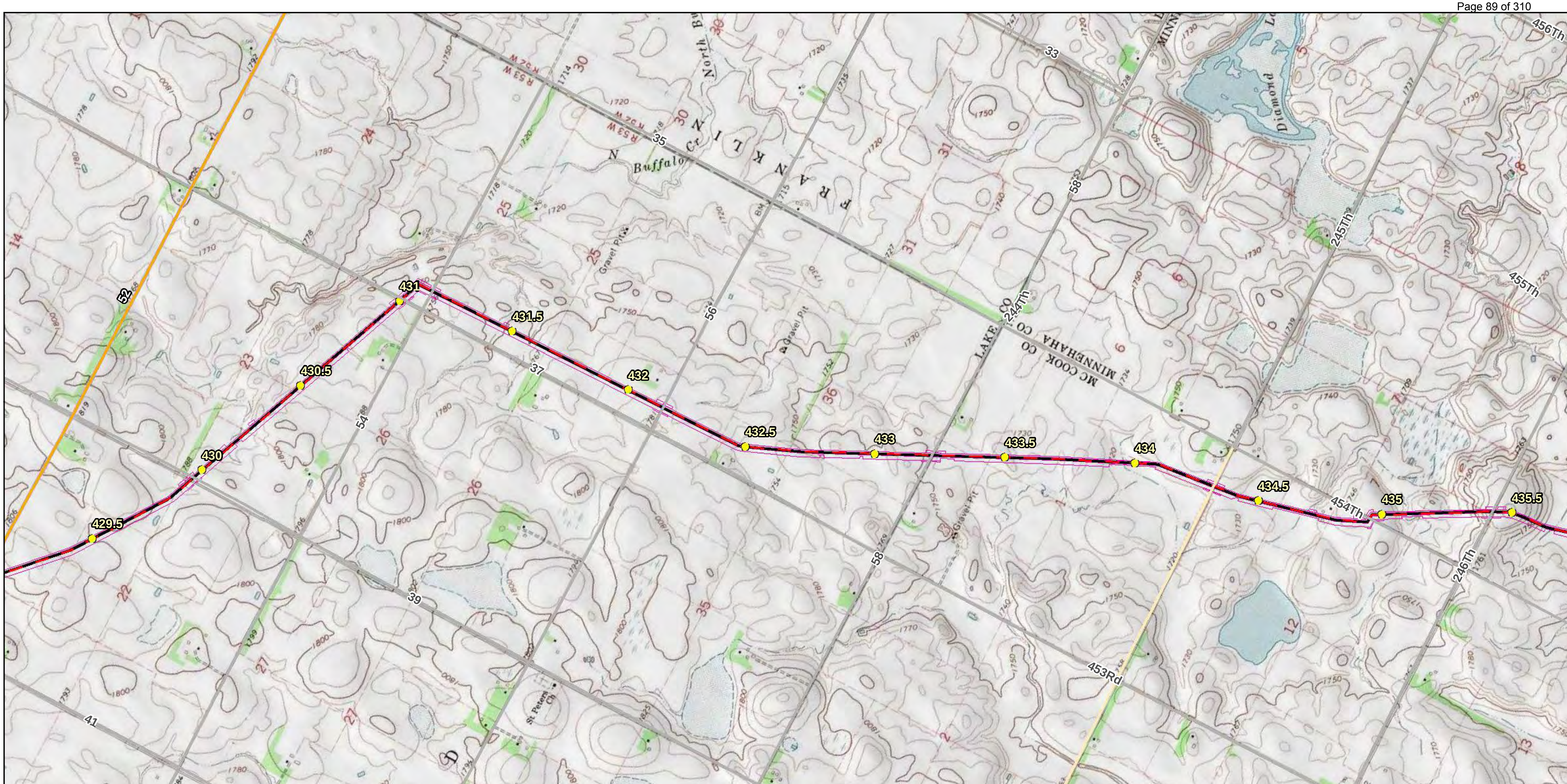
- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 39 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

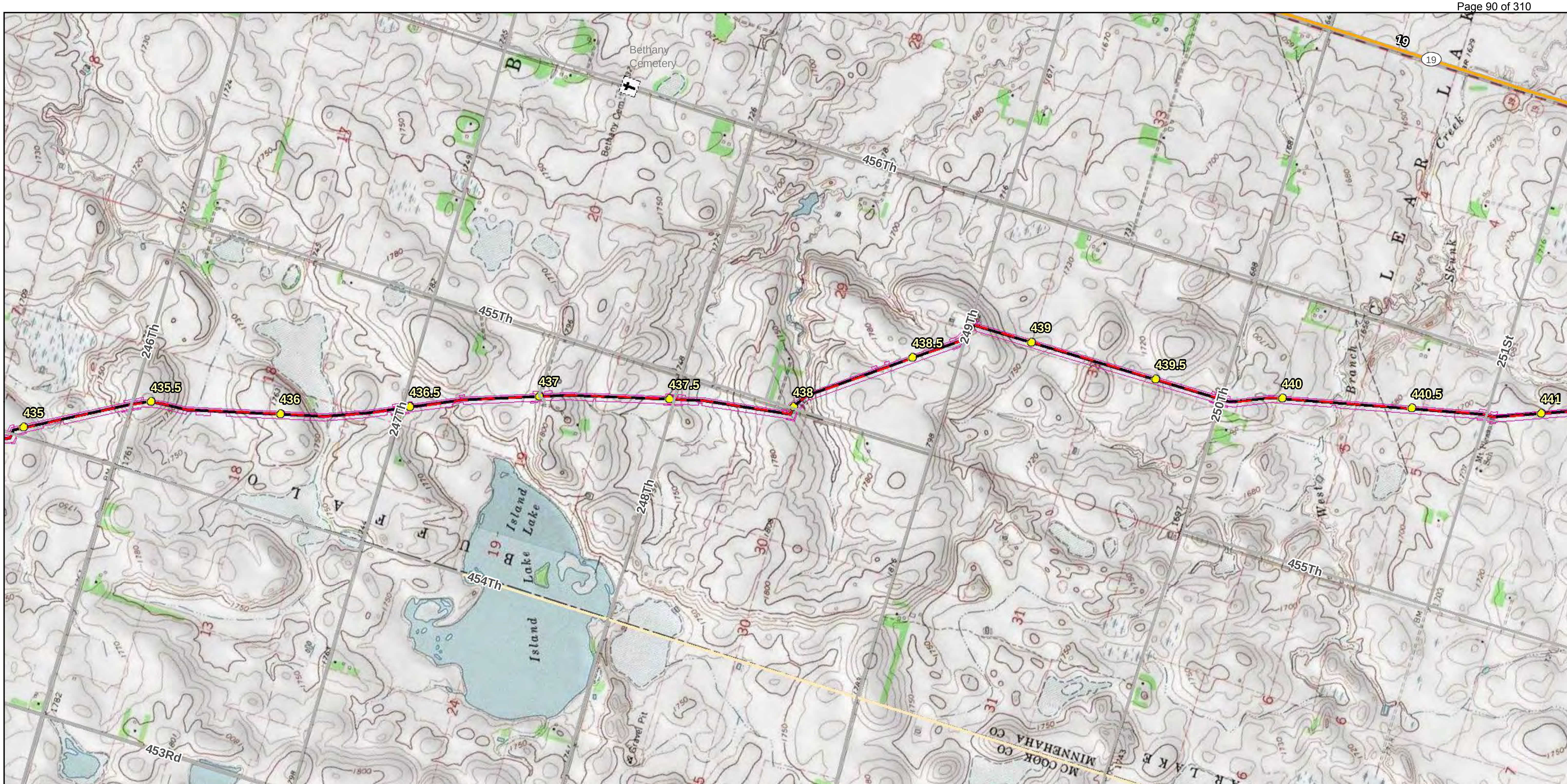
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 40 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



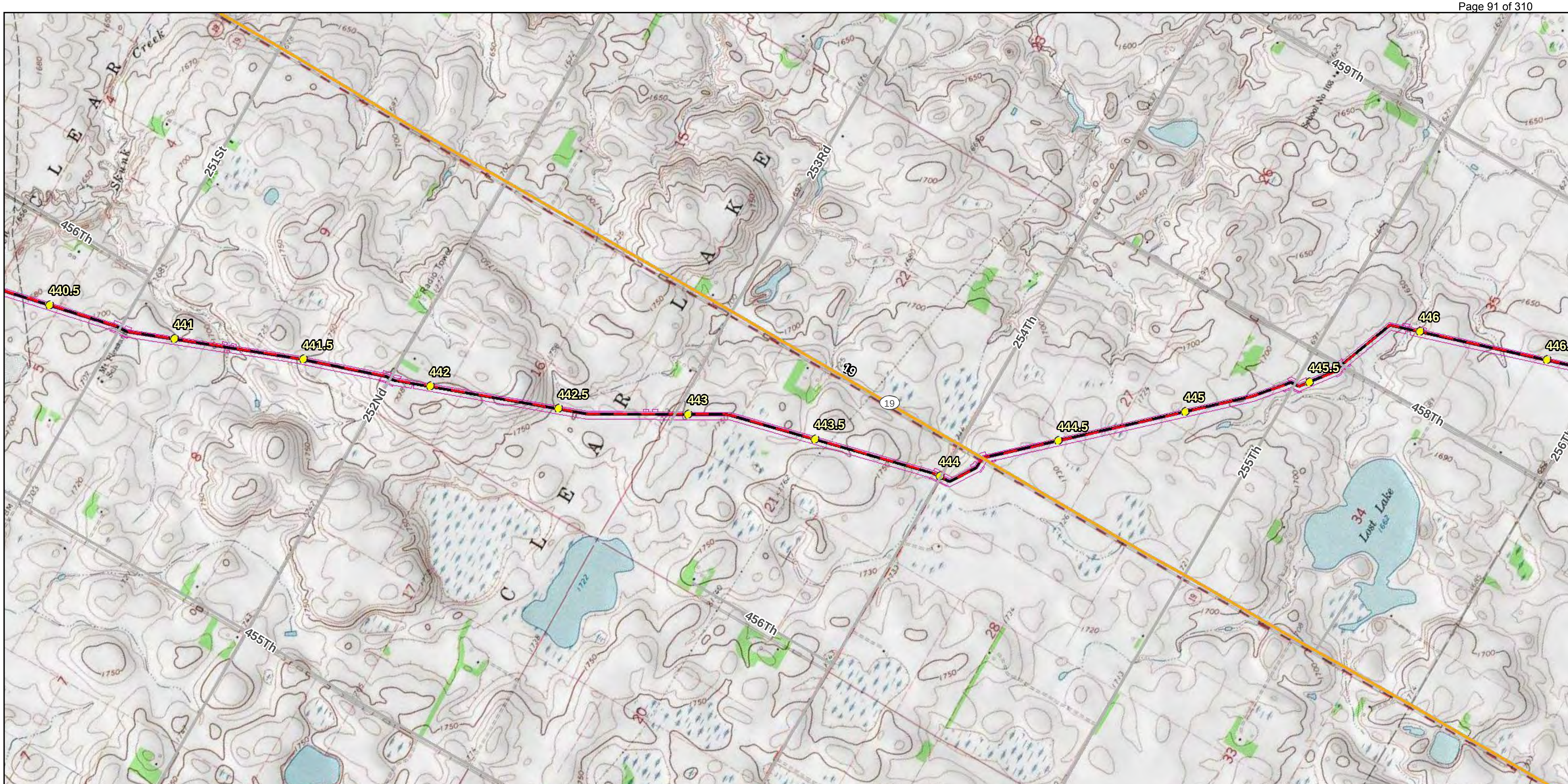
Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

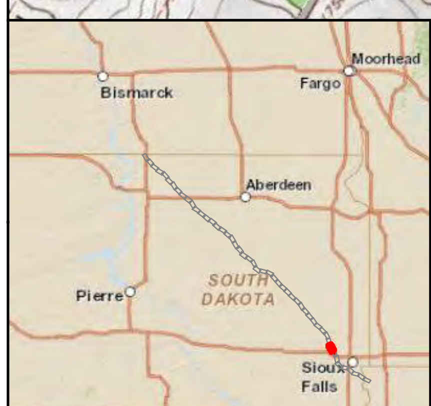
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 41 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015





- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

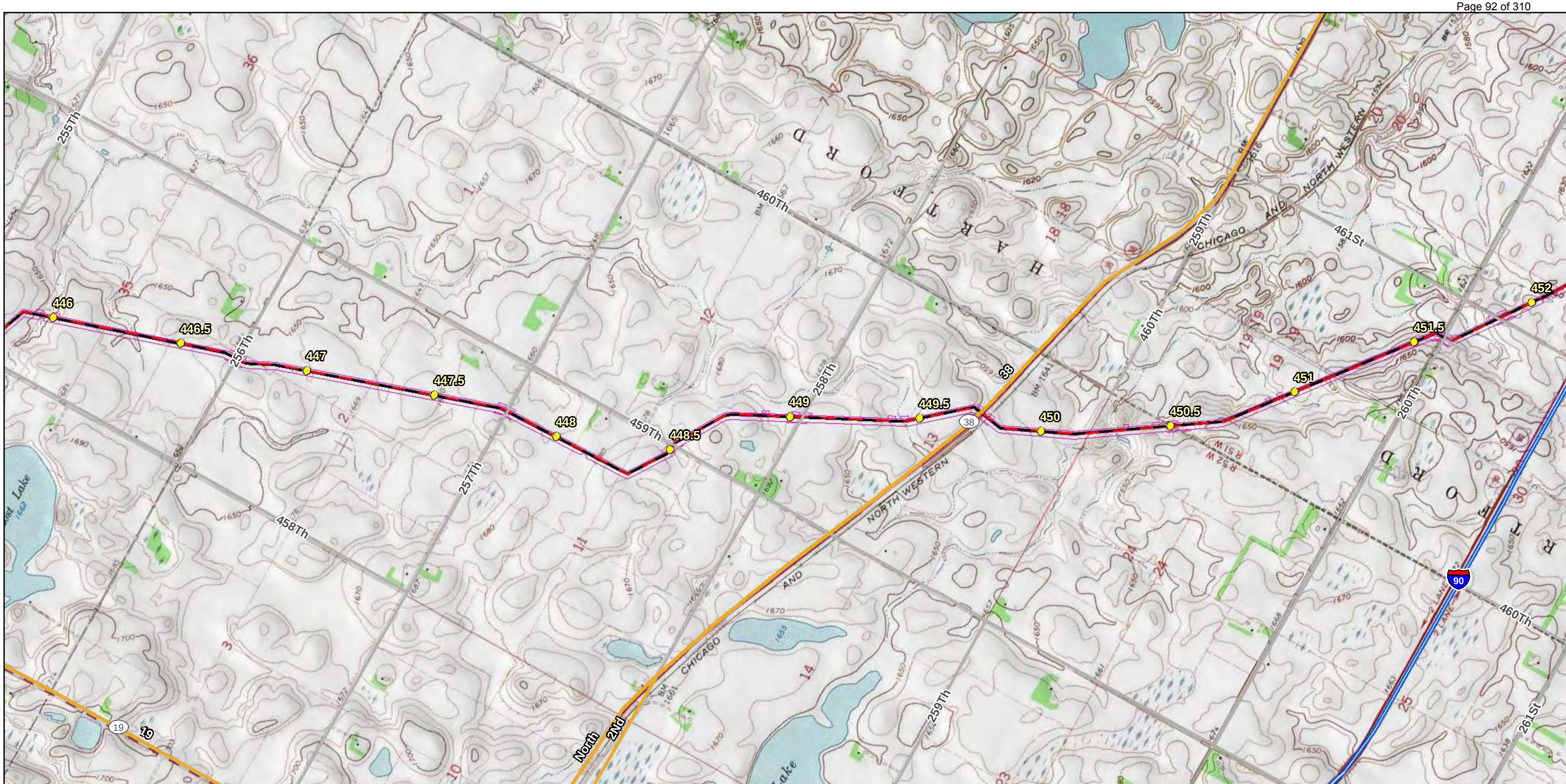
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 42 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



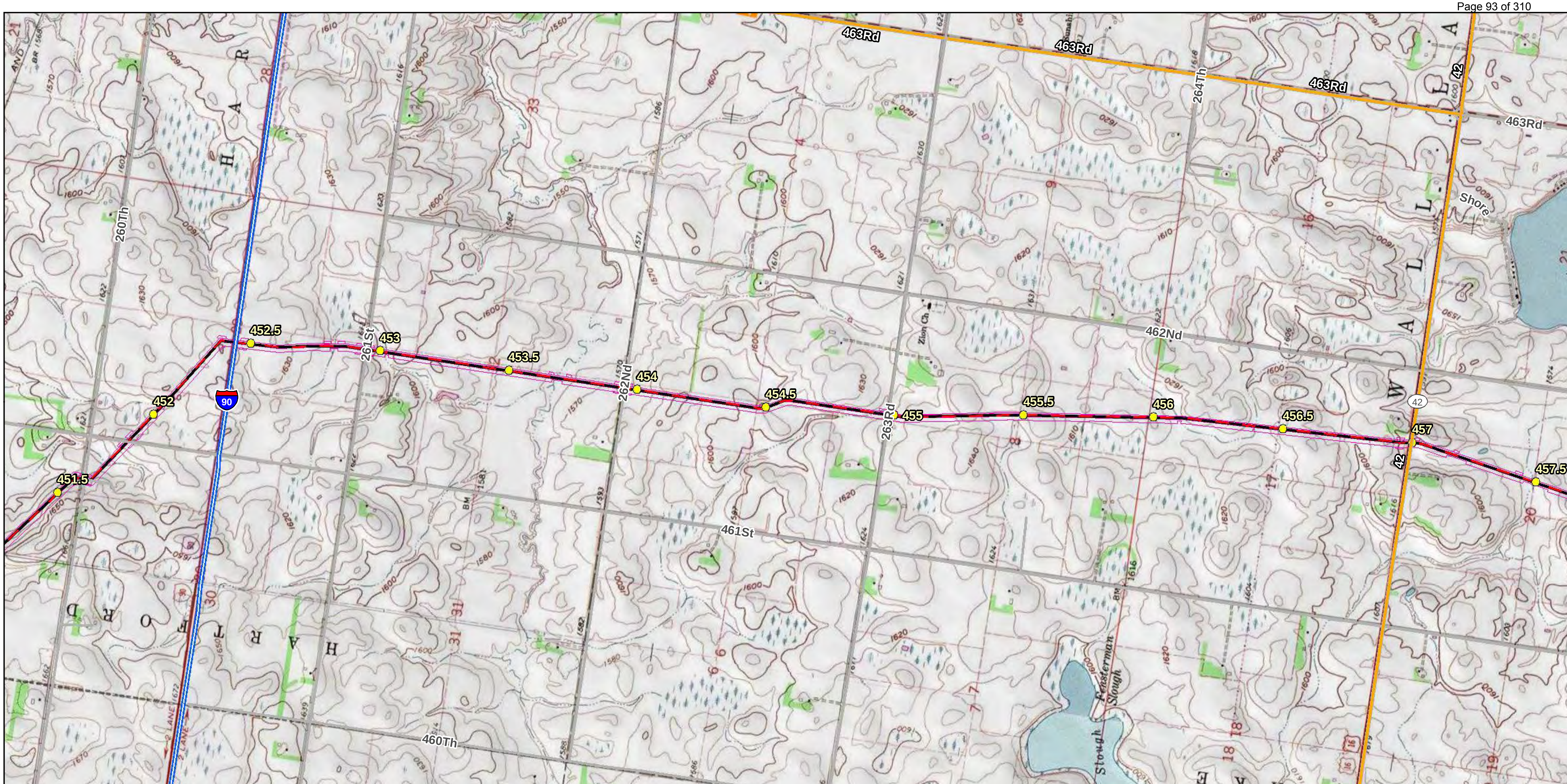
- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 43 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

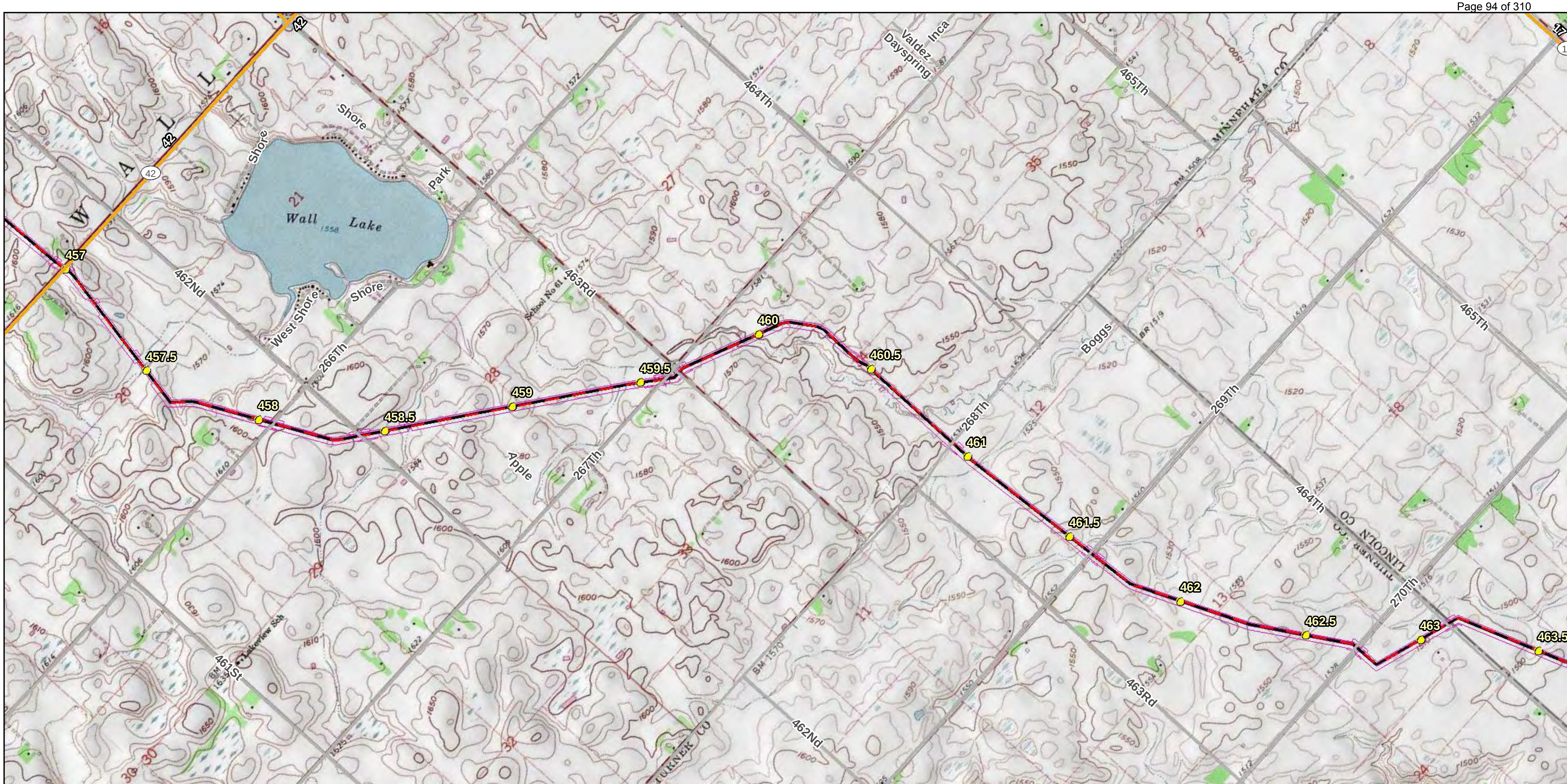
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 44 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

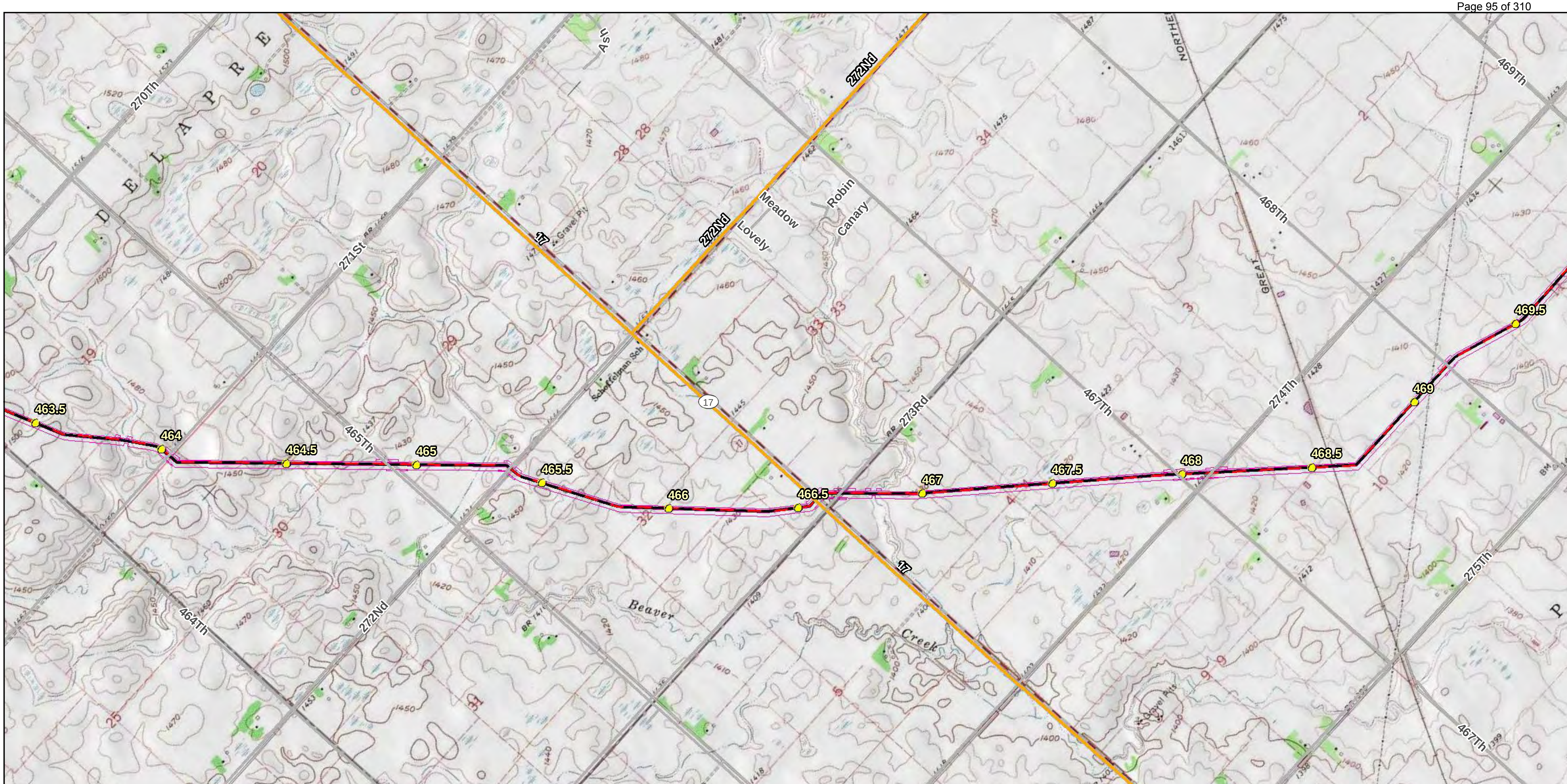
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 45 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



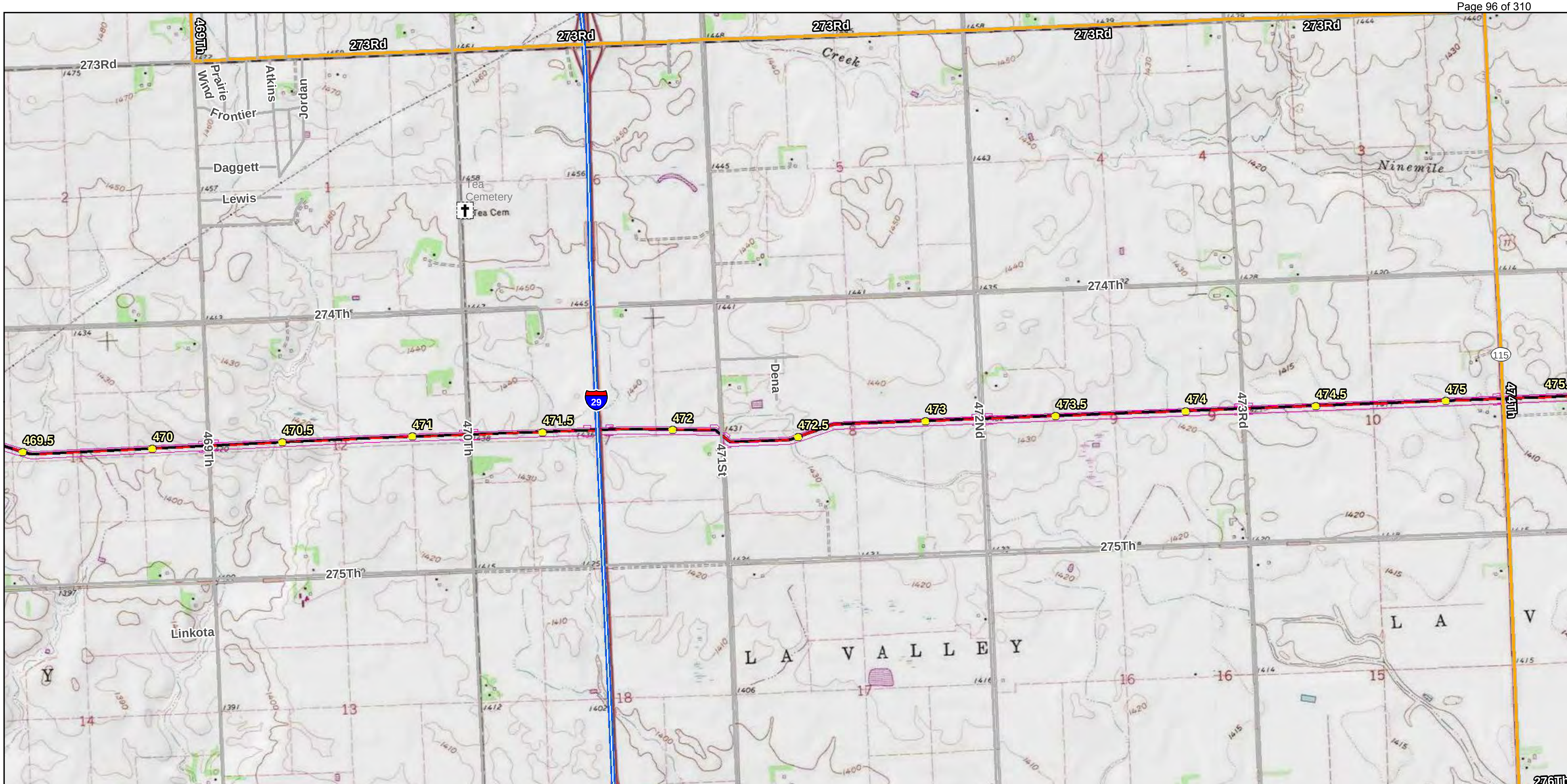
Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 46 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015



Milepost	Spink Pump Station	Limited Access
Launcher/Receiver	Work Space	Highway
Mainline Valve	Cemetery	Major Road
Proposed Route	Airport	Local Road
		Minor Road
		Other Road

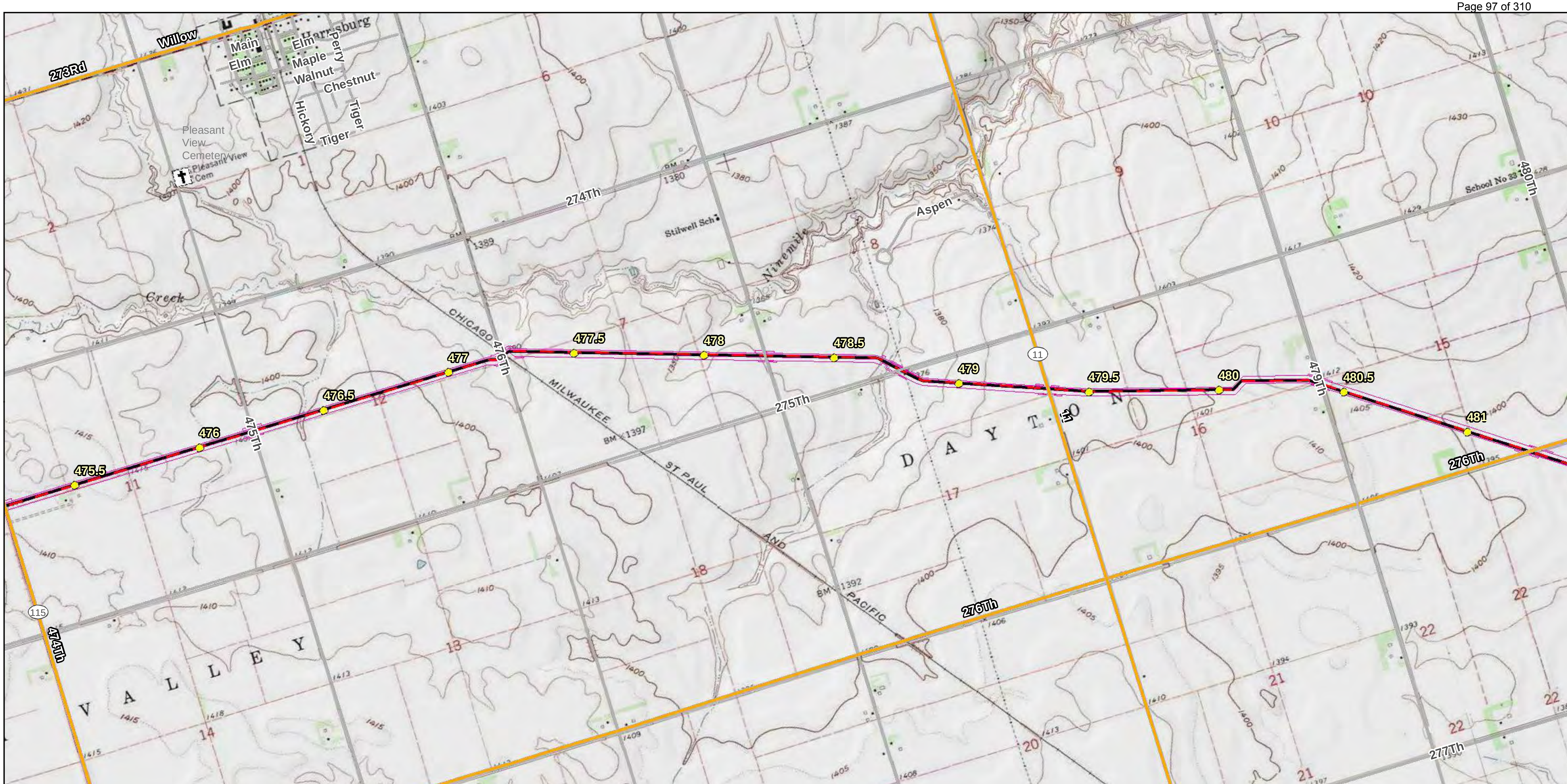
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 47 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



Milepost
Launcher/Receiver
Mainline Valve
Proposed Route
Spink Pump Station
Work Space
Cemetery
Airport
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road

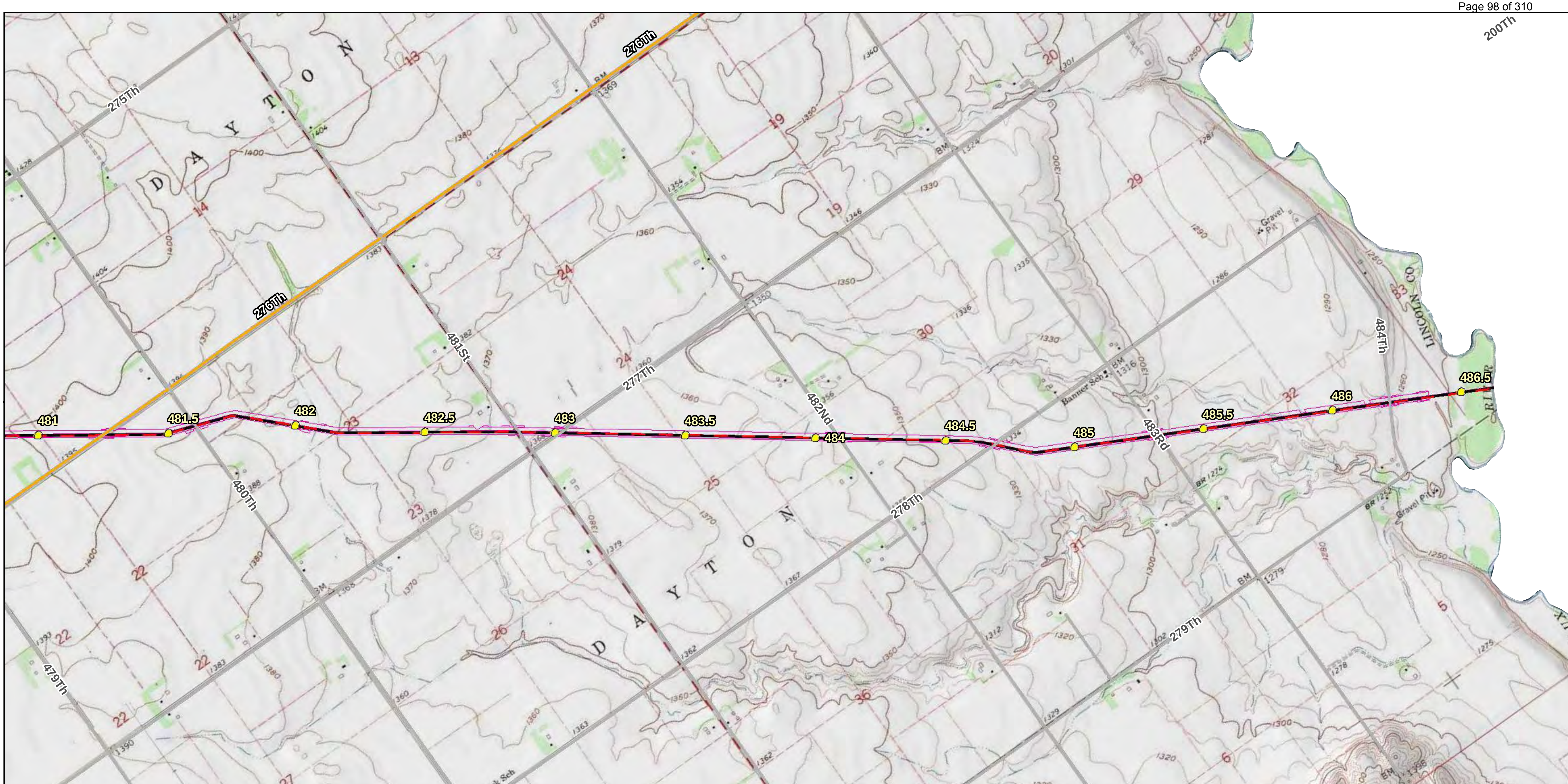
0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 48 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd



- Milepost
- Launcher/Receiver
- Mainline Valve
- Proposed Route
- Spink Pump Station
- Work Space
- Cemetery
- Airport
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

0 2,000 4,000 6,000 8,000 Feet

DAKOTA ACCESS, LLC

Dakota Access, LLC
Dakota Access Pipeline Project
General Site/Topographic Map
South Dakota

Page 49 of 49	Scale: 1:24,000
NAD 83 South Dakota South Ft	Date: April 2015

Path: P:\GIS\Client\ETC_EnergyTransfer\DakotaAccess_DAPL\Maps\ENV\PUC2\14_Topographic.mxd

GeoEngineers

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Jack Edwards, Dakota Access, LLC
From:	Mark Miller MM Craig Erdman JR for CE
Date:	April 17, 2015
File:	18782-011-00
Subject:	Response to South Dakota Public Utilities Commission Dakota Access Pipeline Project – Proposed Alignment in South Dakota
Attachments:	Figures 1 through 4. Overburden Thickness

INTRODUCTION

At your request, we have prepared this memorandum to respond to three comments (Data Response No. 11 through 13) provided by the South Dakota Public Utilities Commission (SDPUC). These comments are related to the proposed Dakota Access Pipeline (DAPL) alignment or route through South Dakota and were provided to us via email from Jack Edwards of Dakota Access, LLC on March 30, 2015.

Data Response No. 11:

SDPUC Comment: Please provide cross sections of the bedrock geology and surficial geology to depict the major subsurface variations in accordance with Administrative Rules of South Dakota (ARSD) 20:10:22:14(3).

Reply:

ARSD 20:10:22:14(3) states “A written summary of the geological features of the plant, wind energy, or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to depict the major subsurface variations in the siting area.”

The Geology Mapbook in Appendix A of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface in the vicinity of the DAPL alignment. Bedrock is typically exposed at the ground surface near the alignment where it crosses from North Dakota into South Dakota (approximate MP 212). As shown within the mapbook, the geologic materials exposed at the surface along most of the alignment within South Dakota consist of Quaternary glacial drift deposits, eolian deposits, lacustrine deposits, and alluvium. Table A-2B of the preliminary geology and geologic hazards report (GeoEngineers, 2014) presents the geologic units exposed at the surface based on publically available data.

To further address the request, we reviewed the geologic map of bedrock prepared by Tomhave and Schulz (2004) and digital (GIS) data of bedrock occurrence and top of bedrock contours. The Quaternary units overlying the bedrock consist of a variety of glacial drift deposits (outwash, glacial till, and other associated deposits), interglacial deposits, and recent, lacustrine, eolian and alluvial deposits. These glacial and non-glacial deposits vary widely laterally and vertically.

Based on our review, it is our opinion that construction of a cross section along the entire alignment would be impractical. However, in response to the data request, we provide below an expanded discussion of the bedrock geology beneath the Quaternary deposits and the thickness of the surficial materials overlying the bedrock.

Based on the map by Tomhave and Schulz (2004), the bedrock underlying the Quaternary deposits within 5 miles of the proposed pipeline alignment consists of the Fox Hills Sandstone, Pierre Shale, Niobrara Limestone, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, undifferentiated Cretaceous rocks, and Sioux Quartzite. With the exception of the Sioux Quartzite, all of these rocks are Cretaceous (145 to 65 million years old). Only the Pierre Shale, the Niobrara Limestone, the Carlile Shale, the undifferentiated Cretaceous rocks, and the Sioux Quartzite are mapped beneath the proposed alignment.

The Pierre Shale underlies the Quaternary deposits along a majority of the alignment. The Pierre Shale consists of blue-gray to dark gray shale with occasional beds of bentonite, black shale and light-brown chalky shale. There are also minor beds of sandstone, conglomerate and carbonate or ferruginous concretions. The Pierre Shale is up to 1,000 feet thick. The Pierre Shale is mapped beneath the Quaternary deposits from the North Dakota-South Dakota state line (approximate MP 212) to approximate MP 319.4. Between MP 319.4 and approximate MP 361.7, the Pierre Shale is mapped beneath the alignment intermittently. The Pierre Shale is then mapped beneath the overburden along the alignment from approximate MP 363.5 to approximate MP 417.2 and then approximate MP 419.5 to approximate MP 420.4.

The Niobrara Limestone (also known as the Niobrara Formation) consists of white to dark gray argillaceous chalk, marl and shale, with occasional thin beds of bentonite, chalky carbonaceous shale, sand and small concretions. The Niobrara Limestone is up to 150 feet thick. The Niobrara Limestone, as mapped, appears to be consistent with potential karst areas along the alignment as shown on mapping by Tobin and Weary (2004). The Niobrara Limestone is mapped beneath the Quaternary deposits intermittently between MP 323 and approximate MP 363.5. The Niobrara Limestone is mapped beneath the Quaternary deposits along another segment from approximate MP 417.2 to approximate MP 419.5 and approximate MP 420.4 to approximate MP 432.3. The Niobrara Limestone is mapped beneath the Quaternary deposits along two separate segments near the southeastern end of the alignment in South Dakota. The first of these two segments extends from approximate MP 478.4 to approximate MP 479.8; the second segment extends from approximate MP 482.4 to approximate MP 485.4.

The Carlile Shale consists of dark gray to black silty to sandy shale with zones where concretions are found. There are reported to be up to three sandstone layers in the upper portion of the formation. The basal unit consists of sandy calcareous marl. The Carlile Shale is up to 330 feet thick. The Carlile Shale is mapped along the alignment at the surface or beneath the overburden from approximate MP 473.7 to approximate MP 478.4; from approximate MP 479.8 to approximate MP 482.4; and from approximate MP 485.4 to approximate MP 486.8.

The undifferentiated Cretaceous deposits consist of black opaline spiculite, gray to black shale, yellow-brown to gray chalk, gray silty clay and sandstone. The thickness of the undifferentiated Cretaceous deposits is up to 400 feet. The undifferentiated Cretaceous deposits are mapped beneath the Quaternary deposits or at the ground surface from approximate MP 441.4 to approximate MP 444.0, from approximate MP 454.3 to approximate MP 462.1, from approximate MP 462.6 to approximate MP 466.2, from approximate MP 468.7 to approximate MP 470.6, and from approximate MP 472.4 to approximate MP 473.7.

The Sioux Quartzite consists of pink and reddish to tan, fine to coarse-grained iron-stained orthoquartzite with minor meta-conglomerate and metamorphosed mudstone. The thickness of the Sioux Quartzite is estimated to be greater than 1,000 feet. The Sioux Quartzite is mapped at the surface or beneath the Quaternary deposits between approximate MP 432.3 to approximate MP 441.4, from approximate MP 444.0 to approximate MP 454.3, from approximate MP 462.1 to approximate MP 462.6, from approximate MP 466.2 and approximate MP 468.7 and from approximate MP 470.6 to approximate MP 472.4.

Utilizing the top of bedrock contour data and a digital elevation model (DEM) of the ground surface from the U.S. Geological Survey, we developed an overburden thickness map. Bedrock is generally present at variable depths below the ground surface along the alignment, but is typically 50 feet or more below the ground surface along the alignment. Bedrock is relatively shallow (less than about 75 feet below the ground surface) along the alignment near the North Dakota-South Dakota state line, in the central portion of the alignment within South Dakota where bedrock highs occur along the Pierre Shale (between approximate MP 322 and 380), and in localized areas near the southeastern portion of the alignment. Although the overburden is relatively shallow along central portion of the alignment in South Dakota, the cover over the Niobrara Limestone is relatively deep (greater than 100 feet). This is because the Niobrara was exposed in old drainage systems that eroded through the Pierre Shale. These valleys were subsequently filled with sediment during glaciation in the Quaternary.

We present maps of portions of the alignment to show thickness of overburden, based on the locations where the Niobrara Limestone is mapped along the alignment (see Figures 1 through 4).

Data Response No. 12:

SDPUC Comment: In sections 14.7 and 14.8 (ARSD 20:10:22:14(7) and (8)), it is identified that the project will cross approximately 47.5 miles of karst terrain. Please expand on the potential for subsidence to occur along the project route and whether or not the pipeline would be damaged as a result of subsidence.

Reply:

It is important to note that the map by Tobin and Weary (2004), (a digital version of the karst terrain mapping by Davies et al., 1984), was compiled at a very small-scale (1:7,500,000) and is intended to show areas that may be susceptible to karst. Because of the scale of the map, we have found it at times to not be very accurate. In addition, bedrock in the area shown in the map may be susceptible to karst development, but the mapping does not necessarily indicate that karst features are present.

To provide the information requested, we developed maps showing the overburden thickness along portions of the alignment where carbonate rocks are present beneath the alignment (see Figures 1 through 4). Based on this analysis, and review of boring logs from the South Dakota Geological Survey (2015), the thickness of Quaternary deposits over the limestone formations with the potential for karst (specifically the Niobrara Limestone) is typically greater than 75 feet. In an area where the cover appears to be near the minimum, in the vicinity of MP 485, the Niobrara Limestone is estimated to be about 70 feet below the ground surface. In addition, the Niobrara Limestone also appears to be relatively thin (perhaps on the order of 15 to 20 feet) since the underlying Carlile Shale is mapped nearby at a similar depths and based on explorations in the area that encountered Carlile Shale in areas that were mapped as Niobrara Limestone.

Based on the thickness of the Quaternary deposits overlying the Niobrara Limestone and the relatively thin nature of the limestone, we estimate that the risk of substantial karst formation within Niobrara Limestone and the subsequent subsidence of the ground surface to be low. We observed no indications of sinkholes in our review of aerial imagery. Furthermore, there is no mapping of sinkholes, caves, or springs in the vicinity of the alignment based on our research.

Data Response No. 13:

SDPUC Comment: In sections 14.8 (ARSD 20:10:22:14(8)), please expand on the steps Dakota Access will take to protect the pipeline from subsidence. Include a discussion on the known measures Dakota Access could take to protect the pipeline from subsidence.

Reply

ARSD 20:10:22:14(8) states that "An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints."

Based on the information presented in the reply to Data Response No. 12 above, the risk of subsidence related to karst along the project alignment within South Dakota is estimated to be low, therefore, no additional measures beyond conventional best management practices for pipeline construction are anticipated.

Should voids or other signs of karst development be encountered during construction, further, site-specific evaluations could be completed using geophysical methods. Geotechnical borings could also be completed to confirm the presence of voids. Subsidence could be mitigated by grouting voids encountered. Given that the Niobrara Limestone is relatively thin, we anticipate that the size of voids, if encountered would likely be relatively small. In the unlikely event that larger voids or other substantial features are encountered, site-specific review and assessment by a qualified geologist or geotechnical engineer would be recommended.

REFERENCES

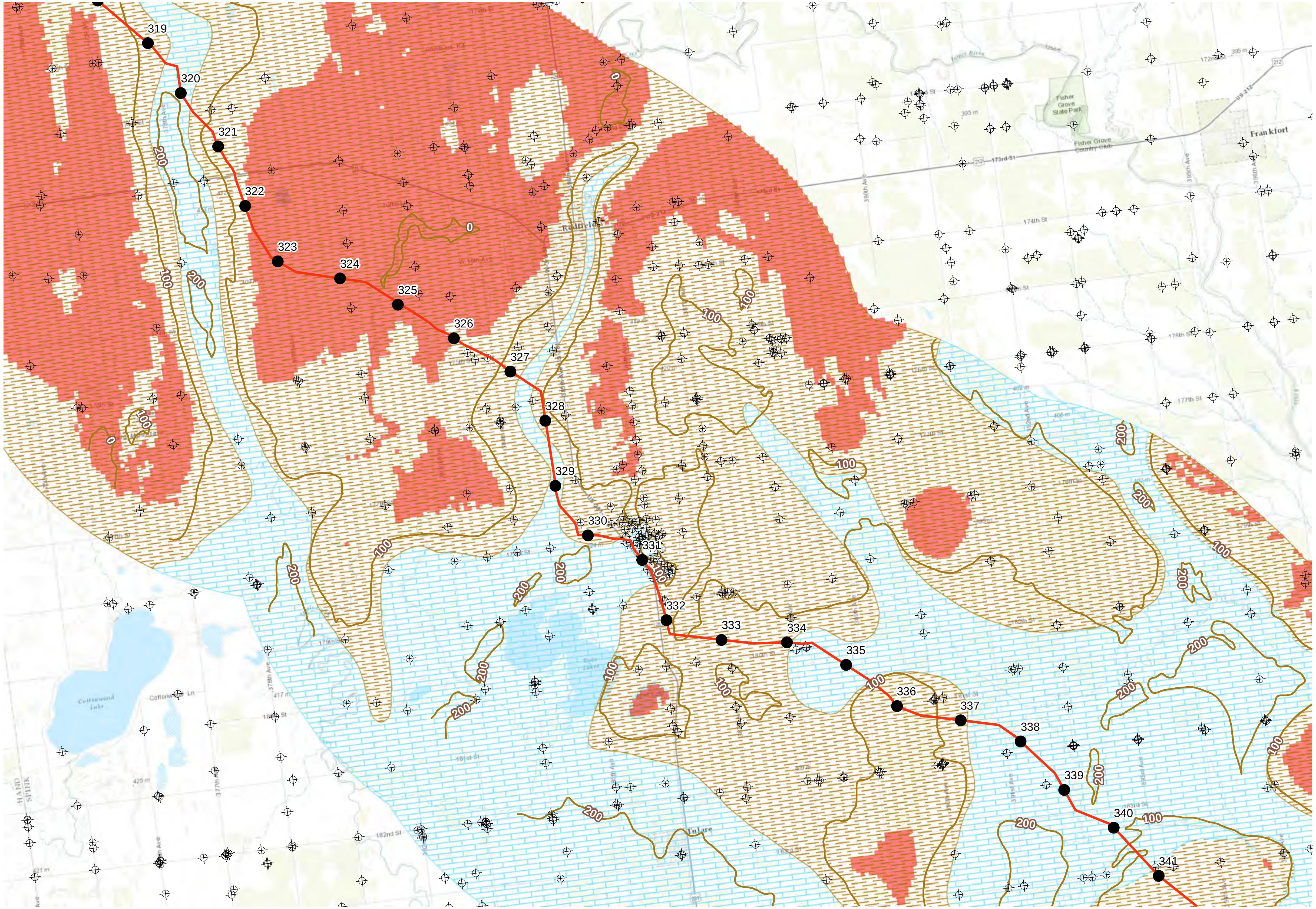
Davies, W.E., Simpson, J.H., Ohlmacher, G.C., Kirk, W.S., and Newton, E.G., 1984, Map showing engineering aspects of karst in the United States: Reston, Va., U.S. Geological Survey National Atlas of the United States of America, scale 1:7,500,000. Dated 1984.

GeoEngineers, Inc., 2014. "Preliminary Geology and Geologic Hazards Evaluation, ETC Dakota Access Pipeline North Dakota, South Dakota, Iowa, Illinois." Prepared for Energy Transfer Company. File No. 18782-011-00. Dated October 17, 2014

Tobin, T.D., and Weary, D.J., 2004. "Digital Engineering Aspects of Karst Map: A GIS Version of Davies, W.E., Simpson, J.H., Ohlmacher, G.C. Kirk, W.S., and Newton, E.G., 1984, 'Engineering Aspects of

Karst: U.S. Geological Survey, National Atlas of the United States of America.'" 1:7,500,000. United States Geological Survey Open-File Report OFR 2004-1352. Dated 2004.

Tomhave, Dennis W. and Schulz, Layne D., 2004. Bedrock Geologic Map Showing Configuration of the Bedrock Surface in South Dakota East of the Missouri River. 1:500,000. South Dakota Department of Environment and Natural Resources, Geological Survey. 1 plate. June 30, 2004.



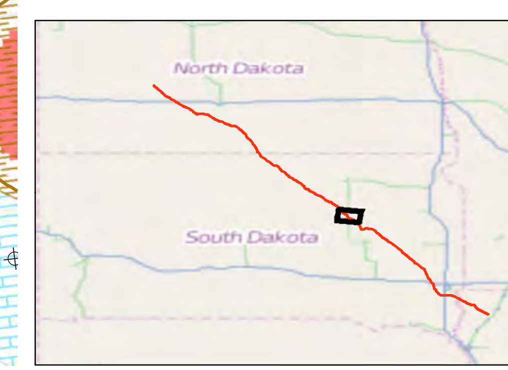
Explanation

- Mile Post
- Well/Boring Log
- Proposed Route
- Thickness of Overburden, 100-foot Intervals
- Areas of Overburden Less Than 50-feet Thick

Bedrock Geology

- Fox Hills Sandstone
- Pierre Shale
- Niobrara Formation
- Carlile Shale
- Greenhorn Limestone
- Graneros Shale
- Dakota Formation
- Cretaceous, undifferentiated
- Sioux Quartzite

0 1 2 Miles



Map Revised: 15 April 2015 glohrmeyer

Path:\\red\projects\18\18782011\GIS\MXD\18782011100_Overburden_Thickness.mxd

Office: Redmond

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

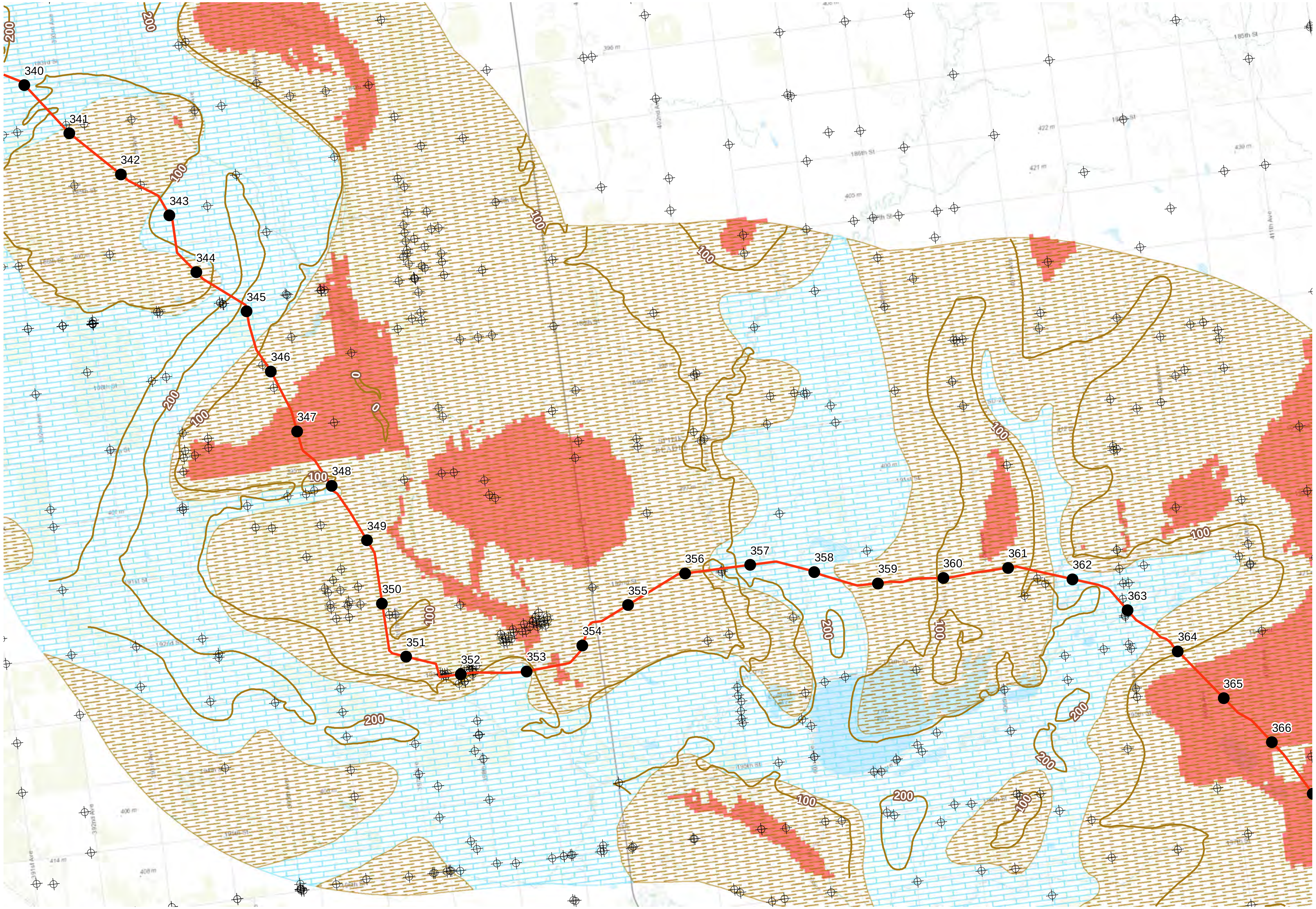
Coordinate System: GCS NAD 1983

GEOENGINEERS

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 1

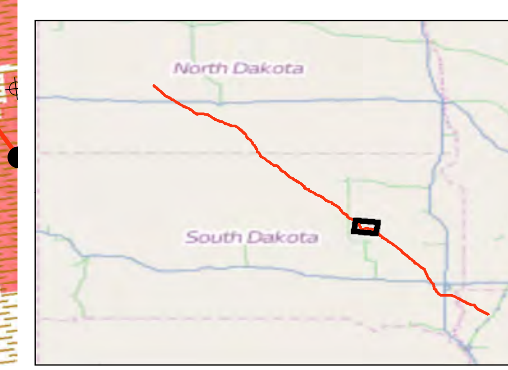


Explanation

- Mile Post
- Well/Boring Log
- Proposed Route
- Thickness of Overburden, 100-foot Intervals
- Areas of Overburden Less Than 50-feet Thick

Bedrock Geology

- Fox Hills Sandstone
- Pierre Shale
- Niobrara Formation
- Carlile Shale
- Greenhorn Limestone
- Graneros Shale
- Dakota Formation
- Cretaceous, undifferentiated
- Sioux Quartzite



Map Revised: 15 April 2015 glohrmeyer

Path:\\red\projects\1\1878201\GIS\MXD\1878201100_Overburden_Thickness.mxd

Office: Redmond

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

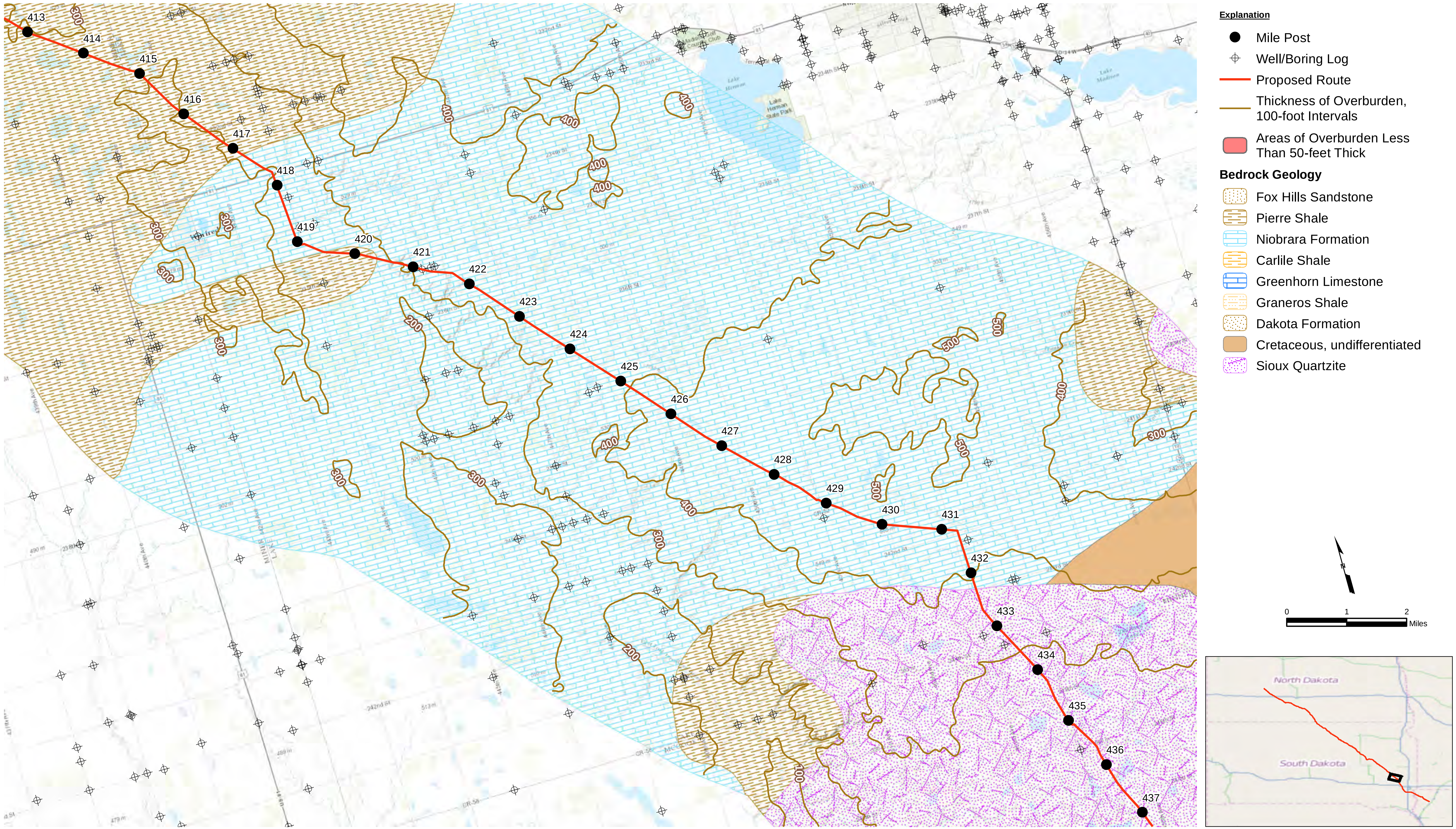
Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 2



Map Revised: 15 April 2015 glohrmeyer

Path:\\red\projects\18\1878201\GIS\MXD\1878201100_Overburden_Thickness.mxd

Office: Redmond

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

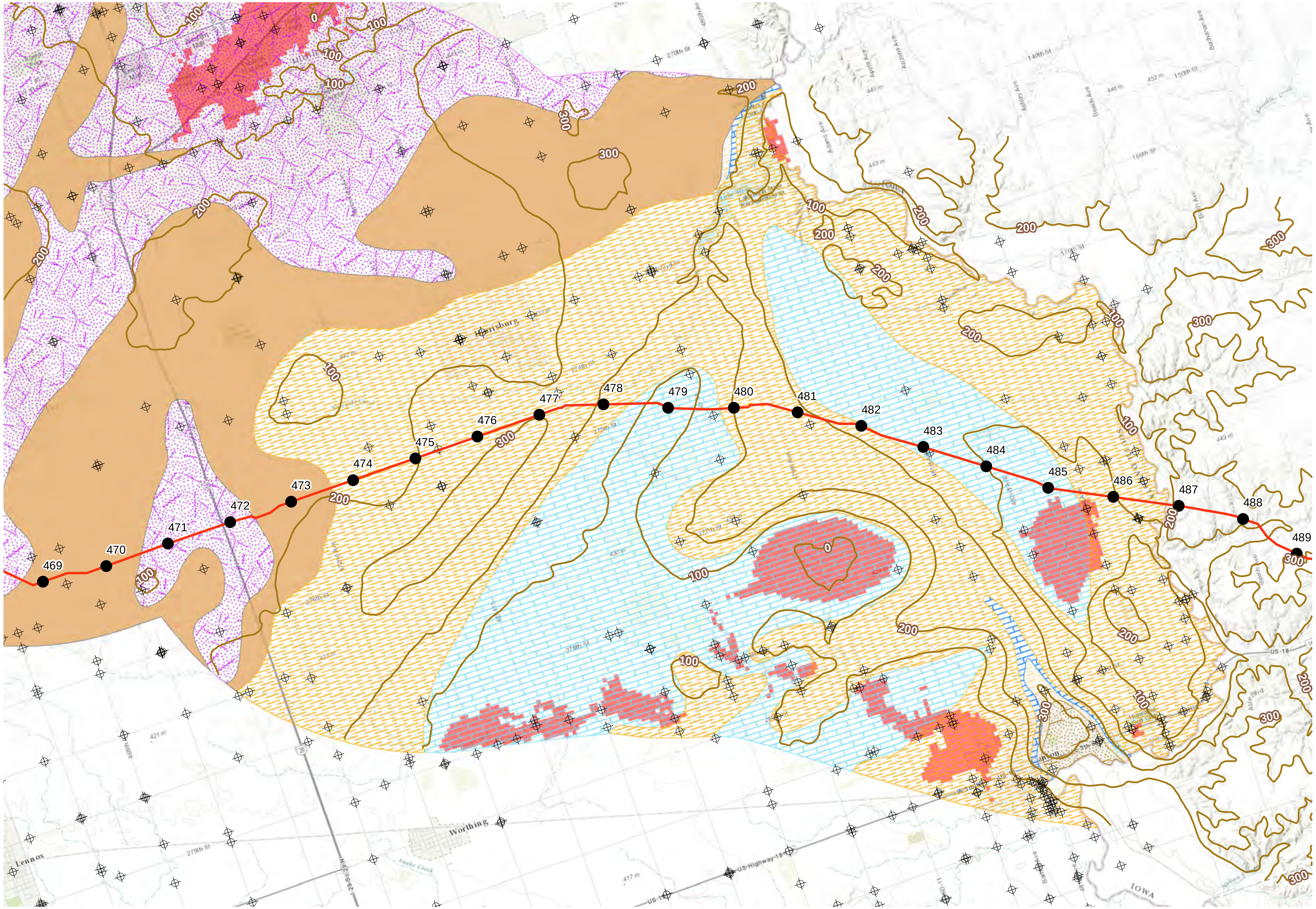
Coordinate System: GCS NAD 1983

GEOENGINEERS

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 3



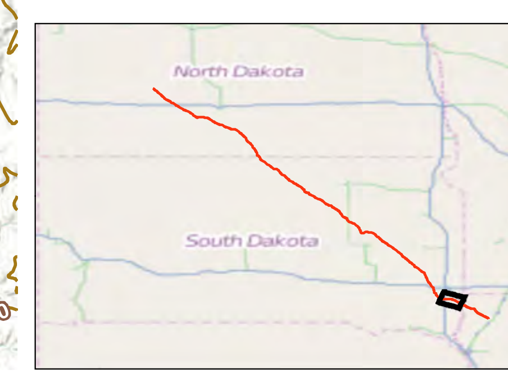
Explanation

- ● Mile Post
- Well/Boring Log
- Proposed Route
- Thickness of Overburden, 100-foot Intervals
- Areas of Overburden Less Than 50-feet Thick

Bedrock Geology

- Fox Hills Sandstone
- Pierre Shale
- Niobrara Formation
- Carlile Shale
- Greenhorn Limestone
- Graneros Shale
- Dakota Formation
- Cretaceous, undifferentiated
- Sioux Quartzite

0 1 2 Miles



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Well/Boring logs obtained from the South Dakota Department of Environment and Natural Resources Geological Survey Program (2014).
Bedrock geology of eastern South Dakota is digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014). The overburden thickness were developed from 10-meter digital elevation model (DEM) grid obtained from the U.S. Geological Survey (2014) and top of bedrock contours in digital format of Tomhave and Schulz (2004) obtained from South Dakota GIS at http://arcgis.sd.gov/server/sdgis/Data.aspx (obtained 2014).

Coordinate System: GCS NAD 1983

GeoEngineers

Overburden Thickness

Proposed DAPL Main Line
South Dakota

Figure 4

Map Revised: 15 April 2015 glohrmeyer

Path:\\red\projects\18\1878201\GIS\MXD\1878201100_Overburden_Thickness.mxd

Office: Redmond

An Assessment of the Economic and Fiscal Impacts of the Dakota Access Pipeline in North Dakota, South Dakota, Iowa and Illinois

Prepared for

Dakota Access, LLC

Prepared by
Harvey Siegelman, Mike Lipsman and Dan Otto
Strategic Economics Group
West Des Moines, Iowa

November 12, 2014

0.0 Executive Summary

This report examines the economic and fiscal impacts of the Dakota Access Pipeline on the region and the four states through which it will be built (North Dakota, South Dakota, Iowa and Illinois). It involves a more than 1,100 mile[1] pipeline that will be built at a cost of more than $3.8 Billion. This pipeline will have a transportation capacity of over 450,000 barrels per day of crude oil from the Bakken oil fields of northwest North Dakota to a hub in Patoka, Illinois. The goal in building this pipeline is to move that crude oil to domestic refineries more safely and at a lower cost than the current alternatives.

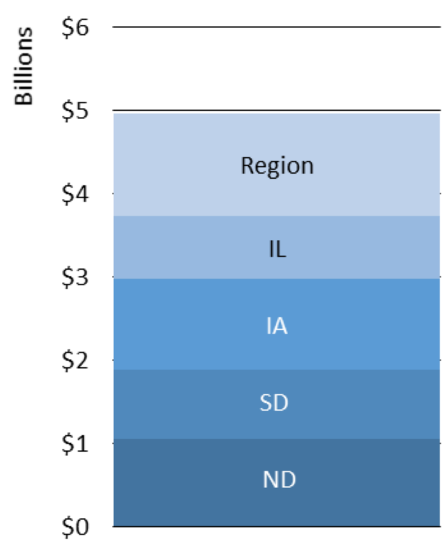
This report endeavors to estimate the economic and fiscal impacts of the pipeline project and to address these issues relating to crude oil transportation in the region.

0.1 Impact on the Region

During the construction stage, the four-state region will experience:

- An employment increase of nearly 33,000 job-years[2] resulting from the direct and the secondary impacts of the spending
- The average annual compensation for those jobs will exceed $57,000
- About 39% of the jobs will be construction jobs, engineering and architectural services will account for about 6% of that increase, followed by food services, real estate and employment services
- The increase in employment will generate a $1.9 Billion increase in labor income
- And a nearly $5 Billion increase in production and sales in the region[3]

Figure 1. DAPL Pipeline Output



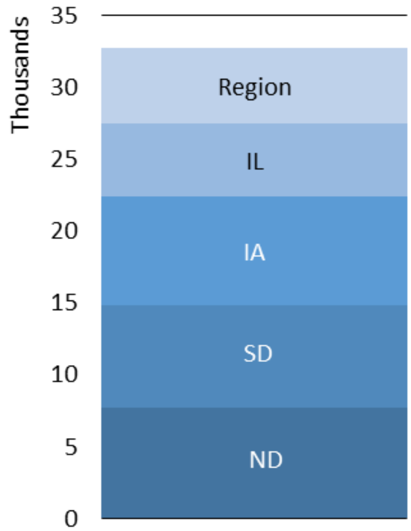
[1] The mileage numbers are approximations based on engineering plans

[2] The term "*job-year*" is used throughout this report to indicate the equivalent amount of work done by one person for one year. Much of the labor done by construction workers will be temporary, for seasonal periods less than a year or with substantial overtime hours. The 33,000 job-years of work is the full-time equivalent of 33,000 40 hours-per-week jobs for one year but will be distributed over the two-year construction stage or however long the construction stage requires.

[3] Not all workers, materials and equipment for this project can be provided within the four-state region. Some of the workers will come from outside of the region, some of the materials will be purchased from outside of the region. As a result, some of the economic impact will extend far beyond the boundaries of this region. While the analysis in this study only examines the impacts within the region and each of the four states, the economic impact

It is not possible to estimate the tax impacts for the region as a whole. This is no doubt larger than the sum of the state fiscal impacts, but the regional model does not provide a way to accurately allocate the extra taxes among the four states.

Figure 2. DAPL Pipeline Job-Years



After the pipeline is completed, the yearly impact of the operations and maintenance activities will add 160 ongoing jobs to the regional economy, generating $11 Million in labor income and more than $23 Million in new production and sales per year.

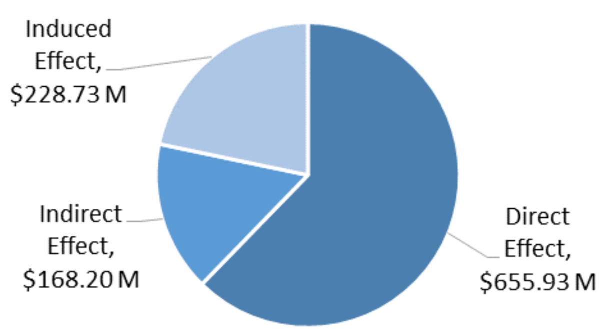
However, the most significant impact will be the felt by the annual taxes that the pipeline will generate for the state and local governments.

0.2 Impact on North Dakota

The cost to build the 346 mile North Dakota portion of the Dakota Access Pipeline is expected to be $1.4 Billion. Of that amount, an estimated $655.9 Million, or 47%, will result in direct purchases within North Dakota. Those direct purchases will cause an additional $397 Million in indirect and induced spending.

The 47% share of local spending that stays within the state is also called the 'local purchase percentage.' It acknowledges that the remaining 53% of the goods and service spending will be purchased from outside of North Dakota. That amount is called the economic 'leakage' and is described in more detail in Chapter 3. The IMPLAN Model local purchase percentages are based on historical data about industrial purchasing patterns and supply chain relationships.

Figure 3. North Dakota Output - $1.053 B



The total impact on spending in North Dakota during the construction stage is expected to

- add nearly 7,700 job-years of employment,
- generate more than $450 Million in labor income and
- add about $1.05 Billion to the production and sales within the state.

---

on the nation will be more than 51,000 job-years, $3.1 Billion in labor income and more than $9.7 Billion in production and sales (output).

The increased economic activity that results during construction of the pipeline will

- generate additional sales, use, gross receipts, and lodging taxes of $32.9 Million for state government, plus
- $1.7 Million for local governments.
- In addition, the state will realize $5.9 Million more from individual income tax.

Once the pipeline goes into operation North Dakota state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $158,000 and income tax increases of about $84,000. Also, during the first full year of operation the pipeline will generate about $13.1 Million in new property taxes for local governments.

One benefit of the pipeline is to relieve existing and anticipated future transportation capacity problems in the Bakken oil fields area of North Dakota. The production of oil in this area has increased from only 10,295 barrels per day at the beginning of 2007 to almost 1.05 million barrels per day during July 2014. This exceptional growth has taxed the transportation infrastructure of the area to the limit and has impacted grain and soybean farmers.

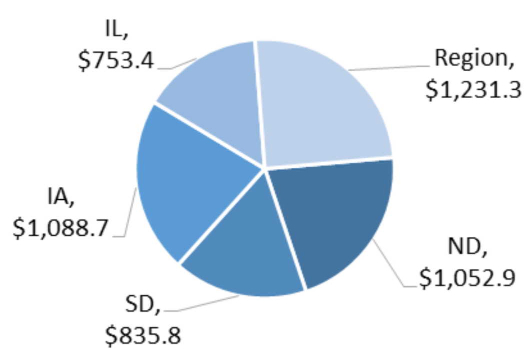
Oil shipments are currently competing with grain and soybean shipments for the limited rail lines, engines and rail personnel. This has already impacted farm commodity prices and farm income in North Dakota, South Dakota and Minnesota.

Currently, at least 70% of the oil extracted from the Bakken area moves to refineries by rail[4], which is more expensive than by pipeline. With oil production in the area expected to increase to more than 1.4 million barrels per day by 2017, additional transportation system capacity is needed.

0.3 Impact on South Dakota

The South Dakota portion of the pipeline will be 267.4 miles long and is expected to cost $8*19.6* Million. Of that amount, about 59%, or an estimated $485.6 Million, will result in direct spending in the South Dakota economy.

Figure 4. DAPL Construction Output ($Millions)



The direct spending within the state will cause indirect and induced spending of $168.2 Million and $186.2 Million.

The total impact on the South Dakota economy will be

- $835.8 Million increase in production and sales,
- $302.8 Million increase in labor income and

[4] http://www.fireengineering.com/articles/2014/07/crude-oil-by-rail-information-and-hazards.html

- more than 7,100 additional job-years of employment.

Once the pipeline has been built, the yearly operations and maintenance spending will add 31 permanent jobs, $1.9 Million in labor income and $4.2 Million in additional production and sales to the South Dakota economy.

The increased economic activity that results during construction of the pipeline will generate additional sales, use, gross receipts, and lodging taxes of $35.6 Million for state government, plus $2.9 Million for local governments.

Once the pipeline goes into operation South Dakota state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $197,000. Also, during the first full year of operation the pipeline will generate an estimated $13.5 Million in new property taxes for local governments.

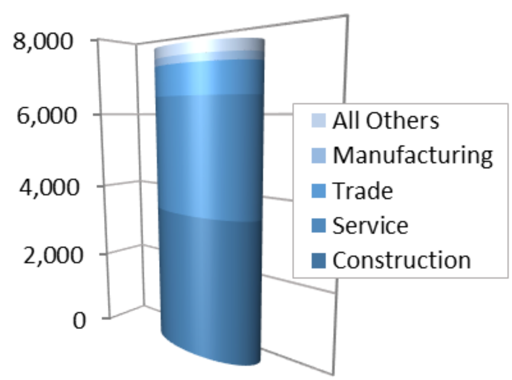
0.4 Impact on Iowa

The Iowa portion of the pipeline will extend for 343 miles. The cost to build it will be slightly over $1.04 Billion, of which $628.4 Million will circulate within the Iowa economy.

That direct impact will generate

- an estimated $386.8 Million in additional indirect and induced growth in production and sales
- adding more than a billion dollars to the Iowa economy.
- The pipeline will create an additional 7,623 job-years of employment during the two-year construction period, generating an additional $390 Million in income.

Figure 5. Pipeline Job-Years Created by Iowa Portion



Once the construction is completed, the Iowa portion of the pipeline will generate 25 permanent jobs, $1.7 Million in additional income and $3.7 Million in production and sales each year.

The increased economic activity that results during construction of the pipeline will generate additional Iowa sales, use, gross receipts, and lodging taxes of $33.1 Million for state government, plus $2.2 Million for local governments. In addition, the state will realize $14.6 Million more from individual income tax.

Once the pipeline goes into operation, Iowa state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $190,000 and income tax increases of about $85,000. Also, during the first full year of operation the pipeline will generate an estimated $27.4 Million in new property taxes for local governments.

0.5 Impact on Illinois

At 177 miles, Illinois has the shortest segment of the pipeline. The cost to build the pipeline and connect it to the trunkline hub in Patoka is expected to be $515.8 Million. Because Illinois is the most industrialized state of the four in the region, about 71%, or $366.6 Million, of the construction spending inputs can be provided by manufacturers, vendors and workers within the state. The 71% is an aggregate local purchase percentage and the remaining 29% would be an estimate of how much would be purchased from outside of Illinois.

The construction stage of the pipeline is expected to provide Illinois with

- An estimated $753.4 Million in additional output, or production and sales,
- $303.4 Million in additional labor income and
- more than 5,000 additional job-years of employment.

Each year after the pipeline is placed in service, its operation and maintenance will create

- $3 Million in additional output, or production and sales,
- $1.5 Million in additional labor income and
- 20 permanent jobs.

The increased economic activity that results during construction of the pipeline segment in Illinois will generate additional sales, use, gross receipts, and lodging taxes of $16.4 Million for state government, plus $3.0 Million for local governments. In addition, the state will realize $7.7 Million more from individual income tax.

Once the pipeline goes into operation, Illinois state and local governments will realize ongoing annual sales, use, gross receipts, and lodging tax increases of about $50,000 and income tax increases of about $45,000. About $747,000 in additional property tax will be generated by the pipeline during its first year of operation because Illinois does not tax below ground infrastructure.

Table 1. Economic Impact of the Construction Stage

Project Area	Output ($Millions)	Labor Income ($Millions)	Job-Years
North Dakota	$1,052.86	$450.35	7,688
South Dakota	$835.84	$302.82	7,137
Iowa	$1,088.74	$390.34	7,623
Illinois	$753.35	$303.30	5,009
Region	$4,962.12	$1,934.39	32,721

Source: Strategic Economics Group

Table 2. Economic Impact of the Operations & Maintenance Stage

Project Area	Output ($Millions)	Labor Income ($Millions)	Jobs
North Dakota	$8.92	$4.42	66
South Dakota	$4.22	$1.95	32
Iowa	$3.67	$1.67	25
Illinois	$3.09	$1.51	20
Region	$23.13	$11.01	160

Source: Strategic Economics Group, IMPLAN Model

Table 3. State & Local Tax Receipts at the Construction Stage ($Million)

State	Income Taxes	Sales/Use, Lodging & Gross Receipts Tax	Property Taxes	Total State & Local Taxes
North Dakota	$5.90	$34.59	$0.00	$40.49
South Dakota	$0.00	$38.53	$0.00	$38.53
Iowa	$14.57	$35.33	$0.00	$49.90
Illinois	$7.68	$19.42	$0.00	$23.10
Total	$28.15	$127.86	$0.00	$156.01

Source: Strategic Economics Group

Table 4. Annual State/Local Tax Receipts at the Operations & Maintenance Stage ($Million)

State	Income Taxes	Sales/Use, Lodging & Gross Receipts Tax	Property Taxes	Total State & Local Taxes
North Dakota	$0.084	$0.158	$13.125	$13.367
South Dakota	$0.000	$0.197	$13.530	$13.727
Iowa	$0.085	$0.190	$27.409	$27.684
Illinois	$0.045	$0.050	$0.747	$0.842
Total	$0.214	$0.595	$54.811	$55.620

Source: Strategic Economics Group

Beyond the state and regional economic impacts that will result from the construction, operation and maintenance of the proposed Dakota Access Pipeline, there exists other transportation cost, safety, and macroeconomic considerations. Some findings related to these are:

- A large share of Bakken oil is currently being transported by railroad and it is affecting the farm economy in Montana, Minnesota and the Dakotas. Trains carry two-thirds of a million barrels of crude produced each day from the Bakken, where pipelines are scarce to refineries. These train engines, tracks and crews would otherwise be available to transport grain from the Dakotas and Minnesota to markets.

- The result is that grain transport has been delayed, freight rates have risen and farm revenue has fallen. Two studies have estimated the current farm revenue losses at between $66 Million in North Dakota and $99 Million in Minnesota. The rail issue has spread to West Central Iowa farmers. A North Dakota Daily News story concluded that, "creating a pipeline has arisen repeatedly by agricultural officials hoping to lessen the severity of the backlog."[5]

- The transportation of crude oil is generally less expensive by pipeline than by railroad. The cost of moving oil from the Bakken area of North Dakota to Gulf Coast refineries during 2013 cost between $1 and $3 per barrel less by pipeline than by railroad.

- During 2011 through 2013 price differentials between Brent and West Texas Intermediate (WTI) crude made it advantageous to ship oil by railroad to East and West Coast refineries rather than by pipeline to the Gulf Coast. During this period the price differential reached as high as $29.59 per barrel during September 2011. At least partially in response to this differential, railroad shipments of crude oil jumped by 255.4% during 2011 and by another 74.4% during 2012.

- A major reason for the large spread between Brent and WTI crude prices was a shipping bottleneck that developed in Cushing, OK, which is the largest storage hub for domestically produced oil. From 2009 to 2013 the amount of oil stored in Cushing rose from 34.5 Million to 51.9 Million barrels. This happened because the United States' pipeline infrastructure was developed to move oil north into Cushing rather than away from Cushing. This problem has now been resolved resulting in Cushing oil inventories dropping to 19.6 Million barrels. Correspondingly the Brent to WTI price differential has dropped to about $5 per barrel.

- Both pipelines and railroads have experienced some spectacular accidents in recent years. But overall the safety records of both modes of hazardous materials transportation are very good. Over the past five years pipeline spills have averaged only 82,000 barrels per year while delivering an average of 13.7 Billion barrels per year of hazardous liquids. Thus, 99.99% of crude oil transported by pipeline is delivered safely to its destination.

- The growth of domestic oil production has exerted significant downward pressure on world oil prices. As of mid-October both Brent and WTI crude are trading at less than $90 per barrel. These lower crude oil prices have flowed through to lower motor fuel and diesel fuel prices resulting in an annual savings of about $33 Billion for households and $11.2 Billion for businesses at current prices.

- Since 2005 U.S. oil imports have dropped by 27.7% and since 2011 U.S. expenditures on oil imports have dropped by 22.2%. These decreases are benefiting the country through reduced foreign trade deficits, a stronger dollar, and lower inflation.

[5] Speidel, Karen, "Experts suggest a pipeline to relieve rail issues." Daily News, September 19,2014

1.0 Introduction

Dakota Access Pipeline, LLC proposes to build a 30-inch diameter crude oil pipeline originating in the Bakken Shale oil field in northwest North Dakota, passing through the states of North Dakota, South Dakota, Iowa and Illinois, and terminating at the trunkline hub in Patoka, Illinois.

1.1 Scope and Purpose of the Study

Dakota Access Pipeline retained Strategic Economics Group to estimate the economic and fiscal impacts associated with the construction of the pipeline on the four-state region and on each individual state. Strategic Economics Group used version 3.0 of the IMPLAN input/output model to estimate the economic impacts. This model and information from state revenue departments were used to estimate the fiscal impacts.

In addition, the analysis addresses the long-term economic and fiscal impacts associated with the operation and maintenance of the pipeline and other associated facilities.

Other issues investigated as part of the study include:

- How crude oil transportation costs differ between railroad and pipeline,
- Accident risks for railroads and pipelines, and
- Spillover economic impacts arising from transportation delays caused by railroads giving priority to crude oil shipments.

1.2 Report Content and Organization

Following this introduction the report consist of seven additional chapters.

- Chapter 2 provides an overall description of the proposed Dakota Access Pipeline project and information on the facilities that will be constructed in each of the four states.
- Chapter 3 explains the methodologies used to estimate the economic and fiscal impacts likely to arise from the construction of the pipeline and its operation. Also, this chapter describes the data sources used for the analysis.
- Chapter 4 presents and explains the estimated pipeline construction economic and fiscal impacts.
- Chapter 5 presents and explains the economic and fiscal impacts expected to arise from the future operation and maintenance of the pipeline.

- Chapter 6 examines issues associated with the transportation of the Bakken oil to refineries and markets. It discusses the impact that railroad shipments of oil is having on Midwest agriculture and ultimately on food prices.
- Chapter 7 discusses transportation cost, accident risk, and spillover impacts associated with the construction and operation of the Dakota Access Pipeline.
- Chapter 8 summarizes the results of the analysis.

2.0 Project Background

2.1 Overview Description of the Pipeline Project

The proposed pipeline will consist of about 991[6] mile 30-inch diameter crude oil trunkline extending from Johnson Corner, North Dakota, through South Dakota and Iowa, to Patoka, Illinois. In addition, in North Dakota a 143 mile in-field pipeline system and six operational storage facilities will be developed. The total estimated cost for the project equals $3.8 Billion. The following sections describe the pipeline and supporting facilities proposed for each of the four states. The pipeline will have an estimated initial capacity of greater than 450,000 barrels per day with the potential to increase its capacity to 570,000 barrels per day.

2.1.1 North Dakota

The proposed North Bank supply segment will be 142.6 miles long and consist of 12 to 30 inch diameter in-field pipelines plus six operational tank storage facilities located in Stanley, Ramberg, Epping, Trenton, Waterford City and Johnson's Corner in North Dakota. Table 3 specifies the pipeline segments that will connect these facilities.

Table 3. Dakota Access Supply Segment and North Dakota Portion

State	County	Crossing Length (Miles)
North Bank Supply Segment		
North Dakota	Montrail	23.3
North Dakota	Williams	69.8
North Dakota	McKenzie	49.5
Total (Stanley-Johnson Corner)		142.6
Mainline - North Dakota Segment		
North Dakota	McKenzie	11.1
North Dakota	Dunn	51.3
North Dakota	Mercer	26.1
North Dakota	Morton	71.4
North Dakota	Emmons	43.5
Total (Johnson Corner - ND/SD State Line)		203.4
Total North Dakota		346.0

Source: Dakota Access, LLC

It also presents lengths for each of the five counties in North Dakota that will be traversed by the trunkline portion of the pipeline. The total North Dakota in-field line and trunkline pipeline mileage

[6] The mileage numbers are subject to change.

equals 346 miles. In addition, one pumping station will be constructed in the state. However, the exact location for the pumping stations has not yet been determined.

The total estimated investment in North Dakota for the crude oil in-field pipelines, operational storage facilities, and construction of the trunkline pipeline, pumping stations, architectural, engineering and real estate services, easement payments and other support services will equal $1.4 billion. Excluding the cost of the pumping stations and tanks, the construction of the pipeline is expected to be $2.73 Million per mile.

2.1.2 South Dakota

The South Dakota section of the pipeline will extend 267.4 miles through 12 counties and cost about $819 Million. Table 4 shows the pipeline mileages for each of the 12 South Dakota counties. Excluding the cost of the pumping station, the construction cost of the South Dakota portion of the pipeline is expect to be $2.91 Million per mile.

Table 4. Dakota Access Mainline - South Dakota

State	County	Crossing Length (Miles)
South Dakota	Campbell	28.7
South Dakota	McPherson	6.6
South Dakota	Edmunds	35.9
South Dakota	Faulk	27.7
South Dakota	Spink	36.1
South Dakota	Beadle	28.5
South Dakota	Kingsbury	21.8
South Dakota	Miner	14.1
South Dakota	Lake	18.2
South Dakota	McCook	1.7
South Dakota	Minnehaha	27.9
South Dakota	Lincoln	20.3
Total (ND/SD State Line to SD/IA State Line)		267.4

Source: Dakota Access, LLC

2.1.3 Iowa

The Iowa section will extend through 18 counties for a total of 343.4 miles and this portion of the project is expected to cost $1.04 billion. Table 5 shows the pipeline mileage for each of the 18 Iowa counties. The expected cost to build the Iowa portion of the pipeline, excluding the cost of the pumping station, is $2.91 Million per mile.

Table 5. Dakota Access Mainline - Iowa

State	County	Crossing Length (Miles)
Iowa	Lyon	10.6
Iowa	Sioux	32.7
Iowa	O'Brien	10.9
Iowa	Cherokee	18.2
Iowa	Buena Vista	28.4
Iowa	Sac	0.3
Iowa	Calhoun	30.8
Iowa	Webster	19.1
Iowa	Boone	25.4
Iowa	Story	14.4
Iowa	Polk	8.6
Iowa	Jasper	33.7
Iowa	Mahaska	32.5
Iowa	Keokuk	6.0
Iowa	Wapello	10.9
Iowa	Jefferson	15.0
Iowa	Van Buren	15.9
Iowa	Lee	30.0
Total (SD/IA State Line - IA/IL State Line)		343.4

Source: Dakota Access, LLC

2.1.4 Illinois

Table 6. Dakota Access Mainline - Illinois

State	County	Crossing Length (Miles)
Illinois	Hancock	29.6
Illinois	Adams	4.8
Illinois	Schuyler	3.1
Illinois	Brown	24.3
Illinois	Pike	2.2
Illinois	Morgan	18.0
Illinois	Scott	14.5
Illinois	Macoupin	36.0
Illinois	Montgomery	15.8
Illinois	Bond	12.0
Illinois	Fayette	11.1
Illinois	Marion	5.9
Total (IL State Line - Patoka)		177.2

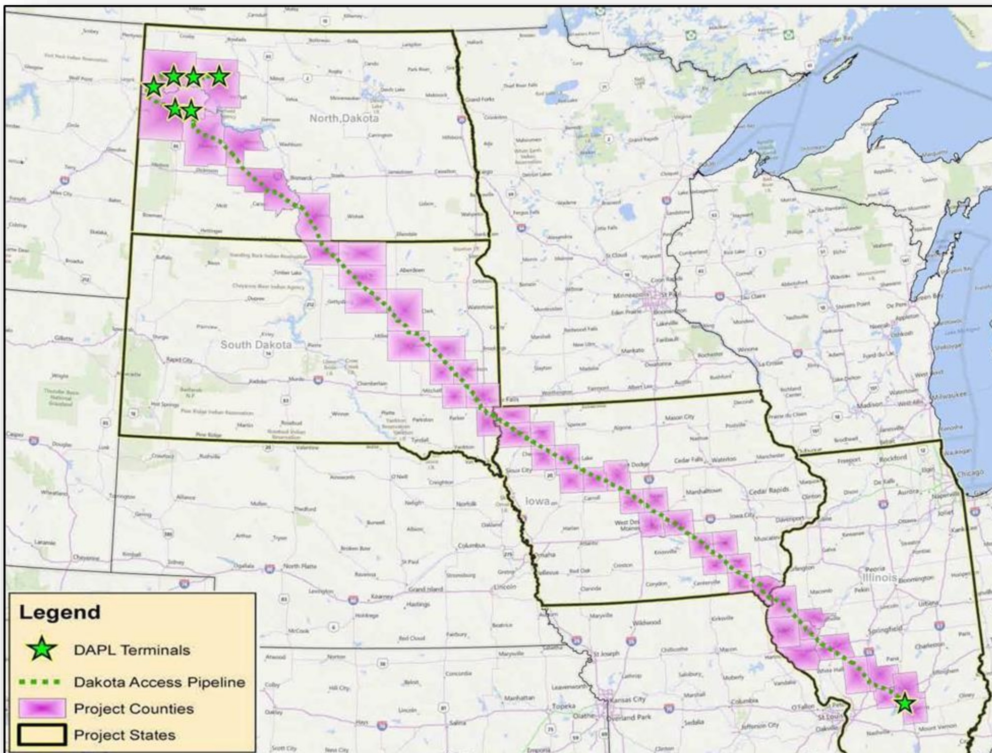
Source: Dakota Access, LLC

The Illinois section of the pipeline will extend for 177.2 miles through 12 counties and cost an estimated $515.8 Million. The Illinois section of the pipeline will not require a pump station. The cost to build the

Illinois portion of the pipeline is expected to be $2.91 Million per mile. Table 6 shows the pipeline mileage for each of the 12 Illinois counties.

Figure 6 shows the proposed path for the the pipeline from Johnson Corner, North Dakota to Patoka, Illinois.

Figure 6. Map of the Dakota Access Pipeline



Source: Dakota Access Pipeline, LLC

3.0 Economic and Fiscal Analysis Methodology

3.1 Data Sources

The data employed in this report includes the estimated costs to build, operate, and maintain a crude oil trunkline pipeline and in-field facilities that will connect the Bakken/Three Forks oil fields of northwestern North Dakota to the major crude oil terminal hub near Patoka, Illinois. This information was provided by Dakota Access, LLC and its affiliates. It includes estimates of the cost of materials, labor, and right-of-way easements and acquisition.

Additional data used in this analysis came from industry publications and from PennEnergy Research. The PennEnergy data was used to provide a basis for independently confirming the Dakota Access construction cost estimates. Among the data acquired from PennEnergy Research is a file of crude oil on-shore pipeline construction cost statistics that cover the years 1980 through 2013.

The analyses done for this report incorporate numerous assumptions. These are stated and explained in the report. The economic impact estimates are based on financial and other data provided by Dakota Access, LLC and obtained from other independent sources. It is important to remember that the analysis results presented in this report are ex-ante or before-the-event estimates. They are dependent on construction, operating, and maintenance costs estimates provided by Dakota Access, LLC.

3.2 The IMPLAN Input/output Model

The researchers built six economic models for this project:

- one model for the four-state region,
- one for each of the four individual states in the region and
- one model to capture the impact on the entire United States[7].

A comparison of the regional impacts to the sum of the four state impacts is intended to identify the interactivity of the economies within the region.

The models were built using version 3.0 of the IMPLAN system. IMPLAN is a product of MIG, Inc. (formerly Minnesota IMPLAN Group). The Acronym stands for *IM*pact analysis for *PLAN*ning.

"The IMPLAN System is a general input-output modeling software and data system that tracks every unique industry group in every level of the regional data, and is designed so almost all the data elements are available for customization. Sources for creation of the background IMPLAN data include BLS [U.S.

[7] The data generated by the IMPLAN Model for the U.S. was not included in this report but could be available from the authors by request.

Department of Labor, Bureau of Labor Statistics], BEA [U.S. Department of Commerce, Bureau of Economic Analysis], and Census.

"IMPLAN traces local impacts by looking back through the supply chain. These backward linkages provide IMPLAN with the information required to examine the iterations of local Indirect and Induced impacts until the initial spending is completely removed from the Study Area by leakage."[8]

3.3 The Mechanics of Linkages and Leakages

Economic impact models like IMPLAN are built on economic relationships that can be described by linkages and leakages. Linkages refer to the supply chain relationships for the materials and services employed in a project. The manufacturers and producers of those goods and services purchase their inputs from other manufacturers and service providers that in turn make purchases from other companies. This cycle of purchases continues until all of the initial expenditure dollars leak out of the region's economy.

The input-output model identifies, for a point in time, all of the relationships between the outputs of all producers and inputs that they buy from other producers (linkages). The IMPLAN model identifies the backward supply chain linkages for 528 industries. In a hypothetical closed economy where all of the suppliers within a region only buy from other suppliers within the same region, the spending loop would be infinite as the spending of one firm would be the income of another and the dollars would keep circulating. But, we do not live in a closed loop economy.

As producers purchase from suppliers that are located outside of the region, some of the spending leaks out of the system (leakages). Profits, savings, and net taxes are also part of the leakage. So, the initial infusion of spending will continue to generate economic activity within the region only until it is completely dissipated or leaked from the economy by imports (purchases from outside the region), profits (monies not spent within the region but paid to owners), savings, and net taxes (taxes minus government spending in the region).

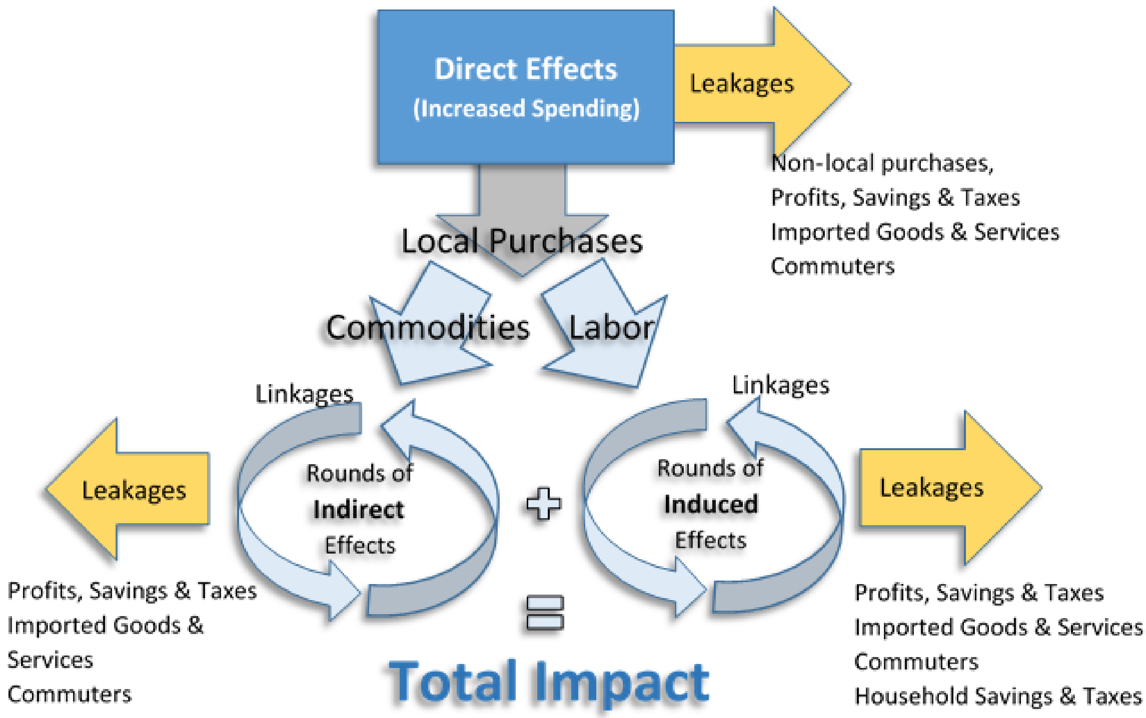
Even a region as large as the entire United States will still experience leakages to the world economy. For an economic impact model to be meaningful, it is important to select a region that is small enough to bring the information to the relevant audience but large enough to minimize the amount of leakages.

In this analysis, the four-state region will undoubtedly have imports of steel and other materials not manufactured in the four target states. Similarly, many of the project work crews will be from outside of the four states. The researchers chose to use a region consisting of the four states rather than one including just the 50 counties through which the pipeline will pass. At the county level the leakages of spending would be too great to be of any meaningful value. Figure 2 illustrates the structure of the IMPLAN Model.

---

[8] Day, Frances, Principles of Impact Analysis and IMPLAN Applications, First Edition, p. 14.

Figure 7. Economic Impact Circular Flow Chart – Leakages and Linkages



3.4 What Will the Economic Analysis Tell Us?

The estimated impacts derived from each of the six economic models (US, region and four states) identify changes to the economy during the construction stage and the operations stage of the project. The economic analyses will include the sum the "consecutive rounds of inter-industry spending traveling back through the supply chain"[9] which we call the *Indirect Effects*. They are called this because they are indirectly stimulated by the initial increase in spending represented by the pipeline construction (or operations).

In addition to purchases of materials and manufactured inputs, there will be an initial increase in employment as a result of the pipeline construction (or operation). Indirect spending will also result in an increase of employment. "The spending of income earned by the employees, resulting from both directly and indirectly affected industries contributes to the *Induced Effect*. The Induced Effect, therefore is a measurement of employee spending of all employees of the directly affected industry, and

[9] Day, Frances, *ibid.* p. 6.

all the employees of subsequent indirectly impacted industries in the supply chain, as long as these employees live within the defined geography of the study."[10]

3.5 Fiscal Analysis Sources

Fiscal analysis involves the identification and estimation of the tax impacts resulting from Direct, Indirect, and Induced expenditures associated with the pipeline's construction and operation. The major types of taxes that will be impacted include:

- property taxes,
- state and local sales, use, and excise taxes, and
- income taxes.

The tax systems of the four states exhibit considerable variation. Therefore, the Revenue Departments of each state were contacted to obtain information on the taxes most likely to be impacted by the project. The tax revenue impact estimates are based on the state provided information and output measures derived from the IMPLAN models. The analysis presents separate tax impact estimates for the construction and operations stages of the project. The methodologies followed in estimating the construction stage fiscal impacts are described in Chapter 4 and those used to estimate operations stage fiscal impacts are described in Chapter 5.

[10] Day, Frances, *ibid*. p. 6.

4.0 Pipeline Construction Impact Analysis Results

4.1 The Construction Stage Inputs

The Construction stage consists of three parts: the in-field and operational storage facilities in the oil fields of North Dakota, the building of the pipeline through the four states and the construction of pumping stations in North Dakota, South Dakota and Iowa. For each of these parts there are required purchases of materials, equipment and labor. Dakota Access, LLC and its affiliates provided expenditure estimates by major category (i.e., construction, pipe, valves, fittings, bends, etc.), which Strategic Economics Group entered into IMPLAN models built to describe the industrial purchasing relationships of similar pipeline construction projects.

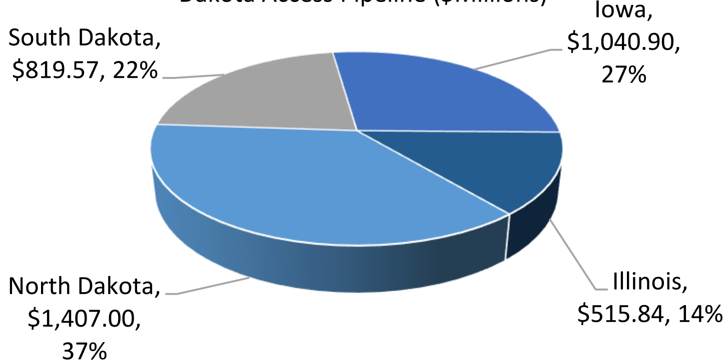
Table 7. IMPLAN Input Spending for the Construction Phase of the Pipeline ($Millions)

Component	IMPLAN Sector	North Dakota	South Dakota	Iowa	Illinois	Region
Pipeline						
Construction labor and land clearing	29	$30.62	$25.22	$32.39	$16.71	$104.95
Construction	36	$504.67	$415.68	$533.87	$275.46	$1,729.67
Pipe	171	$207.91	$171.25	$219.94	$113.49	$712.60
Valves, Fittings, Bends, etc.	198	$56.70	$46.71	$59.98	$30.95	$194.34
ROW Agents	247	$28.35	$23.35	$29.99	$15.48	$97.17
Engineering & Environmental	251	$34.59	$28.49	$36.59	$18.88	$118.55
Construction and Mill Inspection	360	$25.52	$21.02	$26.99	$13.93	$87.46
Easement & Damages	365	$56.70	$46.71	$59.98	$30.95	$194.34
Pumping Stations and Tanks						
Construction labor and land clearing	29	$7.46	$7.99	$7.99	$0.00	$23.44
Tankage	189	$422.30	$0.00	$0.00	$0.00	$422.30
Pumping Station Materials & Equip.	247	$14.50	$14.50	$14.50	$0.00	$43.50
Control and monitoring system	251	$4.70	$4.70	$4.70	$0.00	$14.10
Construction equipment	365	$12.92	$13.91	$13.91	$0.00	$40.74
Easement & Damages	HH	$0.05	$0.05	$0.05	$0.00	$0.15
Total Construction Phase		$1,407.00	$819.57	$1,040.90	$515.84	$3,783.30

Source: Dakota Access, LLC

Table 7 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Construction spending inputs amounted to nearly $3.8 Billion for the region with 37% being spent in North Dakota, 27% in Iowa, 22% in South Dakota and 14% in Illinois (Shown in Figure 8).

Figure 8. Construction Input Spending on the Dakota Access Pipeline ($Millions)



Source: Dakota Access Pipeline, LLC

Estimates of the number of workers necessary to build the pipelines were developed using:

- the amount budgeted for construction of the Dakota Access Pipeline,
- the imputed employee compensation for each state derived from the IMPLAN models, and
- the most recent estimated wage levels for construction and extractive services workers compiled by the U.S. Labor Department, Bureau of Labor Statistics.

The "Easement and Damages" category in Table 7 is treated in the IMPLAN model as direct household payments. These payments represent compensation for damage to and the repair of property associated with construction of the pipeline. In addition, they represent the purchase of a partial ownership interest in the property that provides the pipeline company with the right of access to the pipeline for the purposes of future maintenance and repair.

Table 8 shows the construction spending for which the IMPLAN models generate estimates of employee compensation for each state and for the region. For comparison, the average wage levels for the U.S. Department of Labor, Bureau of Labor Statistics[11] average wage levels for each state for the category "Construction and Extraction Occupations" is included. These estimates are a factor in determining the employee compensation inputs in the IMPLAN model for each state and the region.

[11] Department of Labor, Bureau of Labor Statistics, May 2013 Occupational Employment Statistics (OES) Survey occupation category

Table 8. Development of the Direct Pipeline Worker Estimates from Construction Spending

Category	North Dakota	South Dakota	Iowa	Illinois	Region
Construction Spending ($M)	$504.67	$415.68	$533.87	$275.46	$1,729.67
IMPLAN Employee Compensation ($M)	$127.56	$156.76	$196.01	$59.24	$603.65
BLS Survey Wages - Construction & Extractive Services (47-0000)	$47,650	$34,420	$41,240	$57,550	$46,387
Estimated number of Workers (FTE)	3,788	3,682	3,528	2,100	12,894
Estimated Worker Avg. Wages	$56,660	$33,025	$43,103	$50,364	$48,249

Source: Dakota Access, LLC.

Table 9 compares the estimated number of jobs expected to be created by the construction of the Keystone XL Pipeline[12] and the Dakota Access Pipeline. The Keystone project would entail 875 miles of pipeline through the rural areas of Montana, South Dakota and Nebraska. Much of the labor force for the project will need to be brought in from outside of the sparsely-populated worksite areas and housed in work camps.

Table 9. Comparison of Job-Years Impact of Two Projects

Area	Miles	Direct	Indirect & Induced	Total
Keystone Pipeline Project				
Total US Impact		16,100	26,000	42,100
Keystone Project Area	875	5,400	6,600	12,000
Montana	285	1,600	2,300	3,900
South Dakota	316	1,750	1,850	3,600
Nebraska	274	2,050	2,450	4,500
Dakota Access Pipeline Project				
Total US Impact		17,708	33,662	51,370
DAPL Project Area	1,133	15,879	16,843	32,721
North Dakota	346	4,565	3,123	7,688
South Dakota	267	4,199	2,937	7,137
Iowa	343	3,998	3,625	7,623
Illinois	177	2,482	2,527	5,009

Source: Strategic Economics Group, IMPLAN Model, Keystone XL final Report

Only 34% of the jobs created by the Keystone project are expected to be filled by residents of the three-state region. The Dakota Access Pipeline project will cover about 30% more miles than the Keystone project. It will also occur in rural areas, but will be built in more densely-populated states. The IMPLAN

[12] "Final Supplemental Environmental Impact Statement for the Keystone XL Project, Executive Summary", January 2014, United States Department of State, Bureau of Oceans and International Environmental and Scientific Affairs.

models estimate that the Dakota Access pipeline will result in about 90% of the direct jobs being filled by residents of the four-state region.[13] The indirect and induced impacts will also be greater for the Dakota Access Pipeline project as more material purchases will occur within the more industrialized and densely-populated region.

4.2 The Construction Stage Outputs

Tables 10, 11 and 12 summarize the impacts of the construction spending on each of the four states in the region. Also, they show the impact, separately calculated, on the entire four-state region. The impact on the region is greater than the sum of the impacts on the states within the region (by about 35%). Table 14 also shows this effect. This is because the spending leakages are greater at the state level compared to the region and at the region level compared to that nation as a whole.

Table 10. Production from Construction of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$655.93	$168.20	$228.73	$1,052.86
South Dakota	$485.62	$164.05	$186.17	$835.84
Iowa	$628.43	$209.77	$250.54	$1,088.74
Illinois	$366.57	$164.42	$222.36	$753.35
Region	$2,462.95	$1,092.11	$1,407.07	$4,962.12

Source: Strategic Economics Group, IMPLAN Model

Economists define Output as the value of industry production. In IMPLAN these are annual production estimates for the year of the study and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors it is equal to sales. For retail and wholesale trade, output is equal to gross margin. Using the spending inputs for the Dakota Access Pipeline provided by Dakota Access, LLC, the project is expected to generate an estimated $4.96 Billion for the four-state region including the indirect and induced effects. The amount of production that is expected to occur in Iowa is $1.09 Billion, in North Dakota is $1.05 Billion, in South Dakota is $836 Million and in Illinois is $753 Million.

Table 11. Labor Income from Construction of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$306.14	$66.93	$77.27	$450.35
South Dakota	$182.65	$58.59	$61.57	$302.82
Iowa	$229.82	$79.46	$81.06	$390.34
Illinois	$157.79	$64.47	$81.04	$303.30
Region	$1,016.83	$419.47	$498.10	$1,934.39

Source: Strategic Economics Group, IMPLAN Model

[13] Dakota Access Pipeline officials have indicated that they intend to fill at least 50% of the construction jobs in each state with residents of that state.

Labor income includes the value of all of the income received from employment, including employee compensation such as wages, salaries, benefits as well as the income received by sole proprietors. It excludes receipts that are not work related such as dividends, interest or rent.

Table 12. Employment from Construction of the Project (Job Years)

Project Area	Direct	Indirect	Induced	Total
North Dakota	4,565	1,157	1,966	7,688
South Dakota	4,199	1,291	1,646	7,137
Iowa	3,998	1,520	2,104	7,623
Illinois	2,482	919	1,608	5,009
Region	15,879	6,362	10,481	32,721

Source: Strategic Economics Group, IMPLAN Model

Table 12 shows that the employment impact of the pipeline construction will be more than 32,000 job years for the region. Some jobs may exist for more than a single year and that is why the employment impact is measured in job-years. Also, a job does not necessarily equate to an FTE (full-time equivalent) position. Some workers may be employed for less than 40 hours per week. However, for a construction project, like the one that is proposed, it is likely many workers will work a considerable amount of overtime.

Table 13. Top Employment Sectors in the Construction Phase of the Dakota Access Pipeline (Job Years)

IMPLAN Sector	Description	Direct	Indirect	Induced	Total	Share
0	Total	15,879	6,362	10,481	32,721	100%
36	Construction of other new nonresidential structures	12,856	0	0	12,856	39%
369	Architectural, engineering, and related services	827	1,020	21	1,868	6%
413	Food services and drinking places	0	244	1,184	1,428	4%
360	Real estate establishments	450	149	393	992	3%
382	Employment services	0	501	221	722	2%
29	Support activities for oil and gas operations	700	5	0	706	2%
319	Wholesale trade businesses	0	345	322	666	2%
397	Private hospitals	0	0	612	612	2%
394	Offices of physicians, dentists, and other health practitioners	0	0	549	549	2%
356	Securities, commodity contracts, investments, and related activities	0	207	235	442	1%
329	Retail Stores - General merchandise	0	66	372	438	1%
324	Retail Stores - Food and beverage	0	64	349	413	1%
398	Nursing and residential care facilities	0	0	413	413	1%
388	Services to buildings and dwellings	0	226	140	365	1%
189	Metal tank (heavy gauge) manufacturing	319	6	0	325	1%
380	All other miscellaneous professional, scientific, and technical services	261	48	12	321	1%
	All Others	465	3,482	5,659	9,607	29%

Source: Strategic Economics Group, IMPLAN Model

Table 13 shows that 39% of the estimated job years created in the region will be in the construction field. The table also shows the broad range of job titles associated with the construction stage of the pipeline project. Many of these positions are jobs that are affected by the indirect and induced spending associated with the project.

Table 14 shows a comparison of the employment impacts (in job years), labor income impacts and output impacts. It also illustrates how the size of the analysis area affects the degree of leakages, the multipliers and therefore the magnitude of the numbers.

Table 14. Comparison of Construction Impact on the Region and States

Impact Type	Employment	Labor Income ($Millions)	Output ($Millions)
Region			
Direct Effect	15,879	$1,016.83	$2,462.95
Indirect Effect	6,362	$419.47	$1,092.11
Induced Effect	10,481	$498.10	$1,407.07
Total Effect	32,721	$1,934.39	$4,962.12
North Dakota			
Direct Effect	4,565	$306.14	$655.93
Indirect Effect	1,157	$66.93	$168.20
Induced Effect	1,966	$77.27	$228.73
Total Effect	7,688	$450.35	$1,052.86
South Dakota			
Direct Effect	4,199	$182.65	$485.62
Indirect Effect	1,291	$58.59	$164.05
Induced Effect	1,646	$61.57	$186.17
Total Effect	7,137	$302.82	$835.84
Iowa			
Direct Effect	3,998	$229.82	$628.43
Indirect Effect	1,520	$79.46	$209.77
Induced Effect	2,104	$81.06	$250.54
Total Effect	7,623	$390.34	$1,088.74
Illinois			
Direct Effect	2,482	$157.79	$366.57
Indirect Effect	919	$64.47	$164.42
Induced Effect	1,608	$81.04	$222.36
Total Effect	5,009	$303.30	$753.35

Source: Strategic Economics Group, IMPLAN Model

The construction stage of the Dakota Access Pipeline is expected to generate $9.6 Billion in total output nationally but only about half of that, or $4.96 Billion in output (production and sales), will be captured within the four-state region. That is because many of the manufacturers of products that will ultimately be purchased for this project are located outside of the region. Similarly, the $4.96 Billion in output in the region is substantially greater than the sum of the impacts on the individual states, which adds up to

$3.73 Billion. This illustrates the leakages of purchasing dollars for materials and services that are imported from outside of the region and within the region from outside of each individual state. Also, some of the workers will come from other states to work on this project sending all or a portion of their paychecks to their home state.

The estimates of impacts for the region as a whole capture indirect and induced impacts associated with interactions among the economies of the four states, which the impact estimates for the four states individually exclude. For example, valves purchased for use on the pipeline in South Dakota may be manufactured in Iowa. The individual South Dakota model treats this as a leakage. Also, the Iowa model misses this expenditure because it is not generated by pipeline investment in Iowa. But the regional model captures this economic activity. For that reason, this analysis separately tracks each state as well as the region with a total of the five individual IMPLAN models (Region, North Dakota, South Dakota, Iowa and Illinois) developed for this purpose.

Table 15. IMPLAN Local Purchase Percentage (Share of In-Area Purchases)

Component	IMPLAN Sector	Region	North Dakota	South Dakota	Iowa	Illinois
Pipelines						
Construction labor and land clearing	29	99.8%	100.0%	55.3%	22.3%	69.3%
Construction	36	99.7%	100.0%	99.3%	99.9%	99.6%
Pipe	171	26.0%	2.0%	4.5%	9.4%	25.6%
Valves, Fittings, Bends, etc.	198	22.9%	0.5%	5.4%	9.6%	21.8%
ROW Agents	360	81.9%	48.2%	46.6%	68.1%	88.6%
Engineering & Environmental	369	87.6%	68.4%	69.6%	57.8%	98.8%
Construction and Mill Inspection	380	75.5%	75.2%	28.2%	23.4%	89.1%
Easements and Damages	HH	100.0%	100.0%	100.0%	100.0%	100.0%
Pumping Stations and Tanks						
Construction labor and land clearing	29	99.8%	100.0%	55.3%	22.3%	0.0%
Tankage	189	20.4%	11.0%	0.0%	0.0%	0.0%
Pumping Station Materials & Equip.	247	13.1%	4.6%	5.5%	1.5%	0.0%
Control and monitoring system	251	10.6%	4.5%	6.9%	5.0%	0.0%
Construction equipment	365	92.6%	100.0%	47.7%	68.3%	0.0%
Easements and Damages	HH	100.0%	100.0%	100.0%	100.0%	0.0%

Source: Strategic Economics Group, IMPLAN Model

Table 15 shows the estimated percentage of each input intended to be purchased for each state (or the region) that will actually be produced within that state (or region). For instance, while 26% of the pipe used in the construction of the entire pipeline is expected to be manufactured in the region, only 2% used in North Dakota will be manufactured in North Dakota, 4.5% of what is used in South Dakota will be manufactured in South Dakota, etc.. This table shows the Local Purchase Percentage for each category of construction inputs generated in the IMPLAN models. These factors were based on historical industry research on supply chain relationships.

4.3 Fiscal Impact of Pipeline Construction

The taxes impacted during construction of the Dakota Access Pipeline are sales and use tax, gross receipts tax, lodging tax, tourism tax, and individual income tax. Taxes impacted once the pipeline is in operation are sales and use tax, gross receipts tax, individual income tax, and property tax.

Each of the four states in which the pipeline will be constructed was contacted to obtain answers to the following questions:

- Are sales and use taxes owed on just materials used in the construction of the pipeline or on both materials and labor?
- What local option sales and use taxes apply to construction materials and/or labor?
- Under what conditions would non-resident workers have a tax liability in the state where the pipeline construction occurs?
- Under what conditions would pipeline owners have a state income tax liability?
- Are pipelines subject to property tax and how are pipeline valuations and tax levies determined?
- Are there any other taxes that would apply during construction or operation of the pipeline?

Other state tax information, such as tax rates, services subject to sales and use taxes, and withholding tax payment requirements, were obtained from state departments of revenue Internet sites and from the Federation of Tax Administrators Internet site.

4.3.1 Sales, Use, Gross Receipts, and Lodging Taxes

All four of the states impose sales and use taxes. In addition, North Dakota, Iowa, and Illinois impose lodging taxes, while South Dakota imposes a tourism tax. Also, all of the states allow local governments to impose sales taxes, and all the states allow local governments to impose lodging or tourism taxes. Table 16 summarizes these taxes.

The sales and use tax bases for construction related expenditures vary among the four states. Illinois, Iowa, and North Dakota impose these taxes only on materials used in construction projects. South Dakota taxes materials, labor, and equipment. State sales taxes are imposed on materials and on some services acquired from suppliers located within the state where the transaction occurs. State use taxes generally are imposed on the same types of transactions as sales taxes but apply to purchases from suppliers located outside the state where the purchaser is located. This distinction means that although a large share of the materials used in the construction of the pipeline will be acquired from suppliers located outside the state where they will be used taxes will be owned on these purchases.

Table 16. State and Local Sales, Use, Gross Receipt, and Lodging Tax Features

	Sales and Use Taxes			Gross Receipts/ Lodging Taxes		
State	State Tax Rate	Maximum Local Tax Rate	Tax Base	State Tax Rate	Maximum Local Tax Rate	Lodging & Tourism Tax Base
North Dakota	5.00%	3.00%*	Only Materials	6.00%	3.00%	Lodging, Restaurants & Bars
South Dakota	4.00%	2.00%	Materials, Labor, & Equipment	0.00%	1% Gross Receipts/1.5% Tourism	Food, Lodging & Amusements
Iowa	6.00%	1.00%	Only Materials	5.00%	7.00%	Lodging
Illinois	6.25%	3.75%**	Only Materials	5.64%**	10.00%	Lodging

Source: Strategic Economics Group

* Local governments in North Dakota can impose up to 2.0% sales and use tax and up to another 1.0% gross receipts tax. Only four cities have combined rates of over 2.0%.

** Local governments in Illinois can impose up to 3.75% tax on top of the state 6.25% tax. This makes the maximum combined tax rate equal to 10%. The state lodging tax rate is 6% on 94% of gross receipts.

There are a number of differences among the four states as to how state and local sales, use, gross receipts and lodging taxes apply. The major features of each state's taxes are summarized below:

- **North Dakota** imposes statewide sales and use taxes at a rate of 5%. Local governments may impose sales and use taxes of up to 2% on the same transactions covered by the state tax. In addition, cities and counties may impose a 1% gross receipts tax. According to the Tax Foundation, the average local option tax rate in North Dakota equals 1.55% in 2014. However, most unincorporated areas do not impose local option sales taxes, so the amount of local option taxes generated by the pipeline will likely be less than the statewide average. The state tax rate on lodging accommodations equals 6%. Cities may impose up to a 2% tax on lodging and up to an additional 1% tax on lodging, restaurant food, and liquor sales.

- **South Dakota** imposes a statewide sales and use tax at a rate of 4%. South Dakota has a much broader tax base than the other three states to compensate for not having individual or corporate income taxes. A 2% tax is imposed on the gross receipts of construction contractors. For construction projects materials and labor expenditures are both subject to the tax. Also, the tax is imposed on equipment used on construction projects even if purchased out-of-state and no older than seven years. A credit is provided for taxes paid on the equipment to other states. In addition, the state imposes a 1.5% tourism tax on lodging, amusement, entertainment, and other tourism related businesses. City governments may impose up to a 2% local option sales tax and up to a 1% gross receipts tax. The Tax Foundation estimates local option taxes average 1.83% in South Dakota.

- **Iowa** imposes a 6% statewide sales and use tax. Iowa exempts food for home consumption and prescription medications from sales and use tax. Also, Iowa exempts residential purchases of electricity, natural gas and other heating fuels. City and county governments may impose up to a 1% local option sales tax. There is no local option use tax. This means in most cases construction materials brought into Iowa from other states are not subject to the local option sales tax. For purchases to which local option sales tax applies the average rate in 2014 equals 0.78% according to the Tax Foundation. In addition the state imposes a 5% lodging tax and local governments may impose up to a 7% lodging tax.

- **Illinois** imposes a 6.25% statewide sales and use tax. Illinois taxes food for home consumption and prescription medications at a rate of only 1%. City and county governments may impose local option retailer's sales tax on businesses located within the jurisdiction at rates up to 3.75%. The Tax Foundation estimates the average local sales tax rate for Illinois equals 1.91%. Illinois imposes a statewide 6% lodging tax on 94% of gross room rental receipts. Municipalities may also impose lodging taxes. The highest local rates appear to be in Chicago at 10% and Galesburg at 9%. It appears that many of the smaller southern Illinois counties through which the pipeline will pass do not impose local lodging taxes. For the southern Illinois counties that have a lodging tax the rate averages about 6%.

Table 17 summarizes the estimated sales, use, gross receipts, and lodging taxes that will be owed to the four states as a result of the construction of the Dakota Access Pipeline and other supporting infrastructure. These estimates reflect taxes on purchases directly associated with construction of the pipeline and purchases associated with indirect and induced purchases arising from the pipeline's construction. The table presents the estimates for state and local taxes separately.

The estimated total amount of these taxes the will be generated by construction of the pipeline equals $127.9 million. The state and local shares equal $118.0 Million and $9.9 Million. Due to differences in the laws of the four states the tax burdens vary. For South Dakota the ratio of these taxes to the direct investment amount equals 4.7%. For North Dakota, Iowa, and Illinois the tax to investment ratios equal 2.5%, 3.4%, and 3.8%, respectively.

Table 17. Construction Stage Sales, Use, Gross Receipts, and Lodging Taxes ($ Million)

State	State	Local	Total
North Dakota	$32.88	$1.71	$34.59
South Dakota	$35.60	$2.93	$38.53
Iowa	$33.09	$2.24	$35.33
Illinois	$16.44	$2.98	$19.42
Total	$118.00	$9.86	$127.86

Source: Strategic Economics Group

4.3.2 Individual Income Tax

Illinois, Iowa, and North Dakota impose individual income taxes, but South Dakota does not impose this tax. Generally, individual income taxes are owed in the state where the income is earned. But some states have reciprocal agreements with border states, which means the state of residence has first claim on the tax and the work state only receives tax payments if the work state tax liability is higher than that of the residence state. Then the different between the two states' tax liabilities is owed to the work state.

Iowa and North Dakota have graduated rate structures, while the Illinois tax is imposed at a flat rate. Major features of the individual income tax structures for these three states are described below.

- **North Dakota's** individual income tax has a graduated structure consisting of five income brackets with marginal rates going from 1.22% to 3.22%. The top marginal rate applies to taxable income over $405,100 in 2014. Different tax brackets apply to single, married joint, married-separate, and head-of-household filers. North Dakota has reciprocal agreements with Minnesota and Montana.

- **Iowa's** individual income tax has a graduated structure consisting of nine income brackets with marginal rates going from 0.36% to 8.98%. The top marginal rate applies at a fairly low taxable income level ($68,175 in 2014). Iowa marginal tax rates may appear high, but this is because of the large number of credits, deductions, exclusions, and exemptions allowed. For example, Iowa is one of only three states that allow a 100% deduction for federal income tax payments. There is no marriage penalty associated with Iowa's tax. Iowa has a reciprocal agreement with Illinois.

- **Illinois** currently imposes individual income at a rate of 5%, but in 2015 the rate is scheduled to decrease to 3.75%. The definition of income for the Illinois tax is the same as for federal income tax. Illinois has reciprocal agreements with Iowa, Kentucky, Michigan, and Wisconsin. Illinois offers very few adjustments to income, such as credits, deductions, exclusions, and exemptions, compared to other states. This mean a high share of gross income is taxable.

Table 18 presents individual income tax liability estimates for wage and salary income and for proprietors' income. Tax liability estimates for these two sources of income are based on estimates of wage and salary income and proprietors' income derived from IMPLAN models developed for each state.

The estimates for taxes associated with wage and salary income involved a four step process. First, for each state the total wage and salary income estimates were divided by the total job creation estimates derived by the IMPLAN models by economic sector. Second, these average wage and salary income amounts were multiplied by taxable income percentages derived from U.S. Internal Revenue Service Statistics of Income data for each state. Third, the average tax amounts were derived by applying the state specific marginal tax rates to the average taxable income amounts. Last, the average tax liability estimates were multiplied by the estimated number of jobs created in each economic sector and then summed over all sectors.

The IMPLAN models provide estimates of proprietors' income for each state. The tax liability estimates for proprietors' income assume all of this income represents incremental growth over existing income. As such the tax liability is computed at the marginal tax rate that applies to the average level of proprietors' income for the state.

Table 18. Construction Stage Individual Income Tax ($Million)

State	Wage & Salary Income	Proprietors' Income	Total
North Dakota	$4.16	$1.74	$5.90
South Dakota	$0.00	$0.00	$0.00
Iowa	$7.98	$6.59	$14.57
Illinois	$5.81	$1.89	$7.68
Total	$17.95	$10.20	$28.15

Source: Strategic Economics Group

Additional income taxes may be generated from construction of the Dakota Access Pipeline. In at least some of the states, easement payments made to land owners may be treated as ordinary income. Also, some of the businesses involved in the construction of the pipeline and some businesses that provide goods and services to workers that received income as a result of the construction of the pipeline may be organized as C-corporations. Since corporate income tax marginal rates are greater than individual income tax rates in the three states with income taxes, the above estimates likely somewhat underestimate the state tax impacts. Finally, the above estimates do not reflect economic interactions among the four states arising from the project.

5.0 Operations and Maintenance Impact Analysis Results

5.1 The Operations and Maintenance Stage Inputs

The operations and maintenance stage consists of the on-going activities that will begin near the end of 2016. These activities will require some purchases of materials and equipment and the hiring of a relatively small pool of labor. Dakota Access, LLC provided expenditure estimates by major category (i.e., construction, pipe, valves, fittings, bends, etc.), which Strategic Economics Group entered into an additional set of IMPLAN models built to describe the industrial purchasing relationships similar to the pipeline construction projects. While the expenditures will be divided between project employees and contracted work, the impact on the economy will be the same.

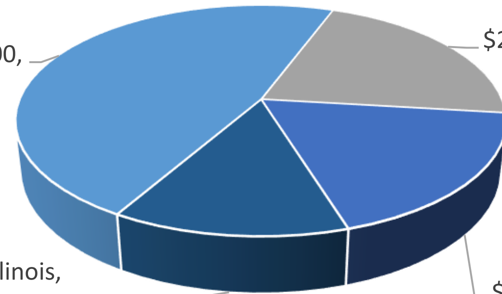
Table 19 shows the values of the spending inputs estimated by Dakota Access, LLC for each state by the appropriate spending categories. Operations and maintenance spending inputs will amount to nearly $13 Million each year for the region with 48% being spent in North Dakota, 21% in South Dakota, 18% in Iowa and 13% in Illinois (shown in Figure 9).

Table 19. IMPLAN Operations & Maintenance Stage Inputs for the Pipeline

Component	IMPLAN Sector	North Dakota	South Dakota	Iowa	Illinois	Region
DAPL Employees						
Number of Workers		27	12	8	6	53
Materials & Equipment ($Millions)	417	$3.45	$1.56	$1.18	$0.81	$6.99
Contracted Work						
Number of Workers		16	7	7	5	36
Materials & Equipment ($Millions)	417	$2.70	$1.20	$1.20	$0.90	$6.00
Total Operations & Maintenance						
Number of Workers		43	19	15	11	89
Materials & Equipment ($Millions)	417	$6.15	$2.76	$2.38	$1.71	$12.99

Source: Dakota Access, LLC

Figure 9. Operations & Maintenance Input Spending on the Dakota Access Pipeline



Source: Strategic Economics Group

5.2 The Operations and Maintenance Stage Outputs

Tables 20, 21 and 22 summarize the impacts of the operations and maintenance spending on each of the four states in the region. Also, they show the impact, separately calculated, on the entire four-state region. The impact on the region is greater than the sum of the state impacts within the region (by about 1.16 times). Just as in the construction stage, the reason for this is that spending leakages are greater at the state level compared to the region as a whole.

Table 20. Production Resulting from Operations of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$6.148	$0.792	$1.979	$8.920
South Dakota	$2.759	$0.432	$1.025	$4.217
Iowa	$2.378	$0.373	$0.916	$3.667
Illinois	$1.705	$0.399	$0.985	$3.090
Region	$12.991	$2.976	$7.164	$23.131

Source: Strategic Economics Group, IMPLAN Model

The estimated operations and maintenance spending inputs provided by Dakota Access, LLC are expected to generate an estimated $23.13 Million in additional output for the four-state region. The annual amount of additional production that is expected to occur in North Dakota is $8.92 Million, in South Dakota is $4.22 Million, in Iowa is $3.67 Million and in Illinois is $3.09 Million.

Table 21. Labor Income Resulting from Operations of the Project ($Millions)

Project Area	Direct	Indirect	Induced	Total
North Dakota	$3.478	$0.275	$0.669	$4.422
South Dakota	$1.469	$0.141	$0.339	$1.950
Iowa	$1.250	$0.127	$0.296	$1.673
Illinois	$0.995	$0.154	$0.359	$1.508
Region	$7.358	$1.114	$2.535	$11.007

Source: Strategic Economics Group, IMPLAN Model

Table 22. Employment from Operations of the Project (Jobs)

Project Area	Direct	Indirect	Induced	Total
North Dakota	43	6	17	66
South Dakota	19	7	6	32
Iowa	15	5	5	25
Illinois	11	2	7	20
Region	89	18	53	160

Source: Strategic Economics Group, IMPLAN Model

Table 22 shows that the employment impact of the pipeline's operations and maintenance will be 160 jobs per year for the region. Some workers may be employed for less than 40 hours per week and some workers may work a considerable amount of overtime.

Table 23 shows that about 56% of the annual jobs created in the region during the operations and maintenance stage will be machinery and equipment repair jobs. Just like Table 13, displayed for the construction stage, this table also shows the broad range of job titles directly or indirectly associated with the this stage of the pipeline project.

Table 23. Top Employment Sectors During the Operations & Maintenance Phase of the Pipeline

IMPLAN Sector	Description	Direct	Indirect	Induced	Total	Share
	Total	89	18	53	160	100%
417	Commercial and industrial machinery and equipment repair and maintenance	89	0	0	89	56%
413	Food services and drinking places	0	1	6	7	5%
382	Employment services	0	2	1	3	2%
397	Private hospitals	0	0	3	3	2%
360	Real estate establishments	0	1	2	3	2%
394	Offices of physicians, dentists, and other health practitioners	0	0	3	3	2%
319	Wholesale trade businesses	0	1	2	3	2%
398	Nursing and residential care facilities	0	0	2	2	1%
329	Retail Stores - General merchandise	0	0	2	2	1%
324	Retail Stores - Food and beverage	0	0	2	2	1%
	All Others	0	12	31	43	31%

Source: Strategic Economics Group, IMPLAN Model

Table 24 shows a comparison of the employment impacts (annual jobs), labor income impacts and output impacts. It also illustrates how the size of the analysis area affects the degree of leakages, the multipliers and the magnitude of the numbers.

Table 24. Comparison of Operations Impact on the Region and States

Impact Type	Employment	Labor Income ($Millions)	Output ($Millions)
Region			
Direct Effect	89	$7.358	$12.991
Indirect Effect	18	$1.114	$2.976
Induced Effect	53	$2.535	$7.164
Total Effect	160	$11.007	$23.131
North Dakota			
Direct Effect	43	$3.478	$6.148
Indirect Effect	6	$0.275	$0.792
Induced Effect	17	$0.669	$1.979
Total Effect	66	$4.422	$8.920
South Dakota			
Direct Effect	19	$1.469	$2.759
Indirect Effect	3	$0.141	$0.432
Induced Effect	9	$0.339	$1.025
Total Effect	31	$1.950	$4.217
Iowa			
Direct Effect	15	$1.250	$2.378
Indirect Effect	3	$0.127	$0.373
Induced Effect	8	$0.296	$0.916
Total Effect	25	$1.673	$3.667
Illinois			
Direct Effect	11	$0.995	$1.705
Indirect Effect	2	$0.154	$0.399
Induced Effect	7	$0.359	$0.985
Total Effect	20	$1.508	$3.090

Source: Strategic Economics Group, IMPLAN Model

5.3 Fiscal Impacts of Pipeline Operations and Maintenance

The operation and maintenance of the Dakota Access Pipeline will result in increases in state and local sales and use tax, state income tax, and local property tax collections in the four states through which it passes. All four of the states impose sales and use taxes, but not all in the same way. Illinois, Iowa, and North Dakota impose state individual income taxes. Local governments in Iowa, North Dakota, and South Dakota impose property taxes on all pipeline infrastructure. In Illinois property tax only applies to pipeline infrastructure that is above ground.

5.3.1 Sales, Use, and Gross Receipts Taxes

The basic features of sales, use, and gross receipts taxes for the four states are described in section 4.3.1. The only major difference between how these taxes apply to construction and to operation and maintenance activities occurs in Iowa. In Iowa only materials are subject to tax for new construction, but for maintenance and repair activities both materials and labor are subject to taxation.

Table 25 summarizes estimates the annual amounts of state and local sales, use, and gross receipts taxes that will be generated as a result of pipeline operation and maintenance activities and the indirect and induced expenditures arising from these activities.

Table 25. Annual Operations Sales, Use, and Gross Receipts Taxes ($Million)

State	State Tax	Local Tax	Total
North Dakota	$0.113	$0.045	$0.158
South Dakota	$0.135	$0.062	$0.197
Iowa	$0.163	$0.027	$0.190
Illinois	$0.038	$0.012	$0.050
Total	$0.449	$0.146	$0.595

Source: Strategic Economics Group

As these estimates show the amount of ongoing sales, use, and gross receipt tax receipts generated by the operation and maintenance of the Dakota Access Pipeline will likely average only about $0.6 million per year. This is because once the pipeline is placed in operation expenditures on taxable material and service purchases will be small unless significant repairs and upgrading of the pipeline or pumping station infrastructure are required. Such major expenditures are not anticipated for a considerable period of time after the pipeline goes into operation.

5.3.2 Individual Income Tax

The major features of the individual income taxes of Illinois, Iowa, and North Dakota are described in section 4.3.2. Estimates of the amounts of income tax that will be owed to these states on wages and salaries paid to workers hired for the operation and maintenance of the pipeline were made using two approaches. The income tax estimates for the workers that will be directly employed by Dakota Access or its contractors follow the same four step procedure used for all of the workers engaged both directly and indirectly in the construction of the pipeline.

For the additional wage and salary income that will result from indirect and induced expenditures arising from pipeline operations and maintenance taxes were computed by simply applying marginal tax rates assumed to be most appropriate. This second approach reflects the assumption that the income associated with indirect and induced activities represents incremental additions on top of other income.

All of the estimated growth in proprietors' income derived from the state IMPLAN models is assumed to be incremental income. Therefore, the margin tax rate applied to this income reflects the average proprietor's income for the state. The marginal tax rates used for these estimates are 3.75% for Illinois, 7.92% for Iowa, and 3.13% for North Dakota.

Table 26 presents annual estimates of additional individual income tax that Illinois, Iowa, and North Dakota may expect to collect as a result of the future operation and maintenance of the Dakota Access Pipeline. Because the future costs of hiring workers to operate and maintain the pipeline will be relatively low, these activities are not expected to generate much additional income tax revenue for these states. South Dakota will derive no additional revenue from this source because it does not impose an individual income tax.

One potential source of additional individual income tax revenue involves tax payments by the pipeline's owners. Because both the Dakota Access Pipeline and its parent, Energy Transfer Partners, are organized as "pass-through" entities, individuals with ownership interests in either entity may owe additional individual income tax. However, these potential additional tax revenues cannot be estimated at this time.

Table 26. Annual Operations Individual Income Tax ($Million)

State	Wage & Salary Income	Proprietors' Income	Total
North Dakota	$0.043	$0.041	$0.084
South Dakota	$0.000	$0.000	$0.000
Iowa	$0.043	$0.042	$0.085
Illinois	$0.022	$0.023	$0.045
Total	$0.108	$0.106	$0.214

Source: Strategic Economics Group

5.3.3 Property Tax

Property taxes represent the largest source of ongoing tax payments that will be received by governments in Iowa, North Dakota, and South Dakota. Because Illinois exempts pipeline infrastructure below ground from property tax, this is not expected to be a significant source of additional tax revenue for local governments.

Although Iowa, North Dakota, and South Dakota all impose property tax on pipeline infrastructure, the manner in which pipelines are assessed and taxes levied varies among the three states. The main features of the administration of the property tax systems of the three states as they apply to pipelines are described below:

- In **<u>North Dakota</u>** the state's Department of Revenue centrally assesses pipelines. The department computes a unitary assessed value for the entire pipeline company and then North Dakota's share of the unitary value is computed by taking the ratio of the value located in the state to the total value. For pipelines that have been in existence for more than three years valuations are determined by averaging the results of three approaches – replacement cost,

cost adjusted for economic obsolescence, and income. However, during the first three years of a new pipeline's existence the valuation is determined giving precedence to the replacement cost approach. By statute the assessed value for pipelines equals 50% of the total valuation. Also, by statute the taxable value for pipelines equals 10% of assessed value. Local governments set the tax levy rates. For FY 2013 and FY 2014 a 12% credit against taxes was in place. No decision has been made regarding extension of the credit. For FY 2012 the average tax levy equaled 19.98% of taxable value or 2.00% of assessed value.

- In **South Dakota** the state Department of Revenue centrally assesses pipeline property. The department uses three methods to determine the property's value – cost approach, market approach, and income approach. However, by necessity the cost approach takes precedence during the first few years of a new pipeline's existence. Within the state assessed valuations for each jurisdiction are based on the value of assets located within the jurisdiction rather than being determined by pipeline mileage located within each jurisdiction. This means the value of a pump station will be allocated to the jurisdiction where it is located rather than spread over all jurisdictions where the pipeline is located. The taxable value of pipeline property equals 85% of the total assessed value. For FY 2012 the average tax levy equaled 2.08% of taxable value.

- In **Iowa** the state Department of Revenue centrally assesses pipeline property. Pipelines are valued as a unit using three approaches – original cost less depreciation, income, and stock and debt. Valuing pipelines as a unit means the entire value of the operating property both inside and outside Iowa is taken into consideration and then Iowa's share of the total value of the property is determined. All assets, including pump stations, are included in the unit value. Iowa's share of the unit value is computed as a weighted average of the ratios of Iowa's share of gross operating property value to the total value and barrel miles of product transported through Iowa to the total for the entire pipeline. In Iowa pipelines are subject to tax on 100% of their assessed value. The levy rates are set by local governments. For assessment year 2013 the average tax levy for pipelines equaled 2.82% of assessed value.

- In **Illinois** most pipeline property is exempt from tax. Only property located above ground is taxable. The assessed value of taxable property in Illinois is set by statute at 33-1/3% of market value. The average tax rate for industrial property for 2012 equaled 2.80% of fair market value.

The estimation of the amounts of property tax the proposed pipeline will generate presents a dilemma due to the different methods used to estimate pipeline valuations. For the three states that impose property tax on all pipeline assets the preferred valuation method is the income approach. However, because income can fluctuate from year-to-year and reliable income data will not be available for several years after the pipeline goes into operation early year valuations by default rely on the cost method. In order a derive reasonable estimates of property taxes that the proposed pipeline will likely generate both construction cost based and income based estimates are presented below for the years 2017 through 2021.

The cost based assessed value estimates reflect construction costs for each of the three states and reflect statutory valuation language for each state. North Dakota and South Dakota have both indicated that assessments based on these cost may be somewhat high, but no written guidance was provided on the amounts by which cost based valuations may be reduced. Iowa did not provide any verbal or written guidance. Effective tax rates were derived using either published pipeline valuation and tax levy statistics or data provided by the state revenue departments.

Table 27 summarizes the cost based property tax estimates for the years 2017 through 2021. The estimates assume the value of the property will depreciate by 2% per year following the initial year of operation. The effect tax rates applied for each state are: North Dakota (2.00%), South Dakota (2.08%), Iowa (2.82%), and Illinois (2.80%).

Table 27. Annual Cost-Based Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$13.775	$13.494	$13.213	$12.931	$12.650
South Dakota	$14.200	$13.910	$13.621	$13.331	$13.041
Iowa	$28.766	$28.179	$27.592	$27.005	$26.418
Illinois	$0.851	$0.834	$0.817	$0.799	$0.782
Total	$57.592	$56.417	$55.242	$54.066	$52.891

Source: Strategic Economics Group

Table 28 summarizes the income based property tax estimates for the years 2017 through 2021. These estimates incorporate the following assumptions:

- The value of the pipeline will depreciate at a rate of 2% per year,
- The debt share of financing equals 62.4% of total cost,
- The interest rate paid on borrowed funds equals 6.5% per year,
- Beginning with the third year assessed values are computed using 3-year moving averages of company financial results,
- Assessed values assume a 9.5% capitalization rate, and
- The effective tax rates are the same as used in the cost based estimates.

One significance difference between the estimates derived by the two methods is the growth trends. The cost-based estimate reflects a reduction in the value of the pipeline over time due to straight line depreciation relative to a fixed amount of initial investment. The income-based approach incorporates revenue growth each of the first five years of the pipeline’s operation. Similar to what is done by the states in computing assessed values for pipelines and other commercial property, Table 29 presents averages of the two estimation methods.

Table 28. Annual Income-Based Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$12.475	$12.706	$12.939	$13.430	$13.898
South Dakota	$12.860	$13.099	$13.339	$13.845	$14.327
Iowa	$26.052	$26.535	$27.021	$28.047	$29.023
Illinois	$0.642	$0.654	$0.666	$0.692	$0.716
Total	$52.029	$52.994	$53.965	$56.014	$57.964

Source: Strategic Economics Group

Table 29. Annual Property Tax Liabilities, 2017 - 2021 ($ Million)

State	2017	2018	2019	2020	2021
North Dakota	$13.125	$13.100	$13.076	$13.181	$13.274
South Dakota	$13.530	$13.505	$13.480	$13.588	$13.684
Iowa	$27.409	$27.357	$27.307	$27.526	$27.721
Illinois	$0.747	$0.744	$0.742	$0.746	$0.749
Total	$54.811	$54.706	$54.604	$55.040	$55.428

Source: Strategic Economics Group

There exist a variety of factors that may result in actual tax liabilities being either higher or lower than the estimates presented in Table 29. Some state revenue departments have indicated they may discount assessments based on the cost approach the first few years until several years of actual income data become available in order to not overvalue the property or to cause significant year-to-year variation in assessed values for the property. Neither approach incorporates any factor that recognizes that oil production from the Bakken area will likely only be maintained at peak levels for a short period of time supporting a shorter depreciable life. Some states may allow an adjustment to income to reflect such “economic obsolescence” on top of normal depreciation.

6.0 Transportation Issues that Impact the Regional Economy

A large share of Bakken oil is currently being transported by railroad and it is affecting the farm economy in Montana, Minnesota and the Dakotas. A Reuters story in May focused on the cause: "U.S. rail shipments of crude oil have surged 44-fold since 2008, much of them crisscrossing the heart of the High Plains wheat belt from North Dakota's Bakken oil fields to coastal refiners. Trains carry two-thirds of 1 million barrels of crude produced each day from the Bakken, where pipelines are scarce."[14]

In Tacoma, Washington, the destination for much of that oil, an editorial in the News Tribune reported that "about three trains of Bakken crude oil move through Pierce County every week. Each train consists of 90 to 120 tank cars; each car carries about 28,000 gallons. The amount could more than double by 2020."[15]

As a result: "the delays have contributed to an accumulation of huge stocks of grain, with North Dakota's corn stocks hitting a record of more than 192 million bushels on March 1 and wheat stocks at their largest in three years, government data showed."[16]

In early August, Shales Play Media reported that "the price to transport a bushel of wheat to the west coast ten years ago was about a dollar a bushel. Today that cost has nearly tripled. Market fluctuations and an increase in oil price over the past few years have driven the price up some, but competition from oil trains has been the main driver of the increased freight rates." And "the high wages paid by oil companies also forces elevator operators to increase their wages so that they can retain employees, further increasing freight prices."[17]

Minnesota Public Radio reported in March that "train delays have been chronic all winter at Agassiz Valley and across the Midwest. Engines are running five to 10 days late, creating an increasingly costly backup. Farmers can't haul grain from their farm storage to the elevator because the grain can't move to market."[18] Not only were farmers and grain elevators impacted, but also producers like General Mills, whose supply of grains were bottlenecked and whose commodity costs were rising.

In May, North Dakota U.S. Senator Heidi Heitkamp asked North Dakota State University (NDSU) to examine the impact that rail delays were having on the state's agricultural industry.[19] The assignment landed on the desk of NDSU crop economist and marketing specialist Frayne Olson. Olson applied an innovative method for preparing an estimate of the impact using changes in the basis of the three major commodities: corn, soybeans and hard red spring wheat.

---

[14] Plume, Karl, "Trains for grain scarce on the U.S. Plains", Reuters New Service, May 14, 2014.
[15] Cronin, Mike, "Crops shouldn't take a back seat to oil shipments", The News Tribune, August 6, 2014
[16] *Ibid*.
[17] Deede, John, "Balancing oil and agriculture". Bakken.com, Shale Plays Media, August 1, 2014.
[18] Gunderson, Dan, "Farmers, elevators fume at costly train delays; oil trains to blame". March 26, 2014.
[19] Olson, Frayne, "Effects of 2013/14 rail transportation problems on North Dakota farm income",

Olson compared the basis from terminals to nearby markets for the agricultural commodities and compared current levels to a reference period to determine the revenue loss to North Dakota farmers.

According to Olson, "there has been an approximately $66.6 million dollar loss in North Dakota farm level revenue for crops that were sold from January through April, 2014." He projected "the potential for an additional $95.4 million dollars in lost farm revenue, from the sale of on-farm grain stocks, if crop basis levels remain at current levels."[20]

Olson compared the historical basis levels to a base year (2009-2010). The basis is the difference between the cash price at the local terminals and elevators and the future contracts prices at nearby markets. He then estimated how much of the difference could be due to the inventory buildups that resulted from rail delays or higher rail costs.[21]

Olson's report was cited on September 4, 2014 by North Dakota Governor Jack Dalrymple addressing the National Surface Transportation Board in Fargo regarding the rail situation. Governor Dalrymple told the members of the Board that corn, soybeans and wheat acres are at record levels in the Dakotas and Minnesota, but there's no place to move it. In North Dakota alone, more than 15 percent of the 2013 grain is still in storage.

The Associated Press coverage of the hearings indicated that "farmers and some politicians believe that increased crude oil and freight shipments from North Dakota's western oil fields are largely the cause of shipping delays."[22] A representative of the railroads denied that they favor one sector over another.

On September 12, 2014, the University withdrew the Olson report as an official publication. NDSU Professor William Wilson was quoted as stating that the conclusions in the Olson study was done too hastily and was "probably not appropriate or defendable".[23] However, Wilson said, "There was nothing radically wrong with the study, but this is a study that should have taken six or 12 months. It's a serious question, it's a serious issue, and it's probably deserving of a serious study."[24] Two weeks later, additional farm price and income data substantiated the Olson conclusions.

On September 25, 2014, Professor Olson indicated that he still stands by the conclusions of his study, given the assumptions and the timing.[25] The issues of rail delays, the buildup of grain inventories at terminals, erratic farm prices and farm revenue losses are complex. According to Professor Olson, the issue is driven by the rail infrastructure.

[20] Olson, Frayne, "Effects of 2013/14 rail transportation problems on North Dakota farm Income."
[21] Knutson, Jonathan, "NDSU Economist defends withdrawn rail impact study." Inforum, September 21, 2014.
[22] Kolpack, Dave, "Officials ask federal board to help on rail delays." Associated Press, September 4, 2014.
[23] Kolpack, Dave, "NDSU withdraws study cited by public officials in hearings on the impacts of rail delays on ag." Daily Reporter, September 12, 2014.
[24] Ibid.
[25] Telephone conversation with Dr. Frayne Olson, September 25, 2014.

The rail system in Montana and the Dakotas is characterized by four factors:

1. a shortage of grain hopper rail cars
2. the lack of sufficient crews - drawn down during the recession years
3. competition for power units (engines) between the oil shippers and the grain producers
4. the limitation of track time in sparsely-populated states

While Bakken oil does not compete with the grain terminals for rail cars because grain hopper cars cannot be used to haul oil, they do compete for the limited number of rail crews, power units and track capacity. Two major rail carriers serve those states, Burlington Northern Santa Fe (BNSF) and Canadian Pacific (CP). Since the Olson study was released and hearings were held by the federal Surface Transportation Board, backlogs have been reduced.

"Dakota Mill & Grain, and the other shippers in the state — accustomed to timely arrivals of hopper cars — saw deliveries last winter fall behind, with rail car backlogs swelling to more than three months at their peak. The impact was immediate: Purchases were delayed because elevators ran out of room to store the commodity, leaving farmers to hold onto crops longer than expected. The cost to ship grain by rail soared, and farmers received less money."[26]

In the short run, rail carriers can hire more crews and in the intermediate term can order the purchase of more power units. However, the available track capacity will continue to be an infrastructure impediment.

"BNSF has been the most active in trying to relieve the problem, working towards adding railways and hiring more workers. However, it is unclear if additional rail capacity will be available this year. The huge backlog of shipments combined with what is expected to be a plentiful harvest in North Dakota makes another winter with strained rails seem likely."[27]

In July, 2014 University of Minnesota economist Edward Usset used the same methodology as Olson to estimate the impact of railroad service delays on farm income.[28] Usset employed the Basis-based analysis to identify the impact that the recent rail transportation bottleneck had on Minnesota grain farmers. Table 30 shows the comparable measures for the Olson and Usset studies.

While Olson estimated the loss to North Dakota grain farmers at $66.6 Million for the previous crop and $95.4 Million for the crop still on the ground, Usset estimated the same measures for Minnesota at $99.3 Million and $147.7 Million.

---

[26] Doering, Christopher, "Ag bracing for railroad delays as record harvest looms." www.Argusleader.com, September 15, 2014.
[27] Deede, John, "Crop shipments still stranded in North Dakota as oil-by-rail dominates", Bakken.com, August 26, 2014.
[28] Usset, Edward, "Minnesota Basis Analysis". University of Minnesota Center for Farm Financial Management, July 10, 2014.

Table 30. Farm Revenue Loss on Basis in 2014

Commodity	Location	
	North Dakota	Minnesota
Soybeans		
Est. Basis Difference ($/bu.)	$0.37	$0.405
Est. Farm Revenue Loss	$11,746,350	$18,830,000
Est. Farm loss On-Farm Inv.	$911,310	$23,895,000
Corn		
Est. Basis Difference ($/bu.)	$0.41	$0.37
Est. Farm Revenue Loss	$17,344,800	$72,000,000
Est. Farm loss On-Farm Inv.	$36,170,200	$122,100,000
Hard Red Spring Wheat		
Est. Basis Difference ($/bu.)	$0.81	$0.41
Est. Farm Revenue Loss	$37,544,813	$8,500,000
Est. Farm loss On-Farm Inv.	$58,274,438	$1,700,000
Total Farm Revenue Loss		
Previous Crop	$66,635,963	$99,330,000
On-Farm Inventory	$95,355,948	$147,695,000

Source: Frayne Olson, North Dakota State University, Edward Usset, University of Minnesota.

Even in western Iowa, farmer-owned cooperatives have begun to feel the pressure. In a Des Moines Register story, “the Corn Belt was pummeled by a brutal winter, and competing demands among coal, oil, grain and other commodities for space on the country's clogged rail network left railroads such as Canadian Pacific Railway and BNSF Railway struggling to ferry cars around the region.”[29] Author Doering wrote, “West Central [a farmer-owned cooperative] – accustomed to waiting a few days to receive hopper cars - had to wait a week, with delays extending to more than six weeks.” The cost to lease a rail car this year nearly doubled to more than $12,500. This will likely get worse with the 2014 bumper crop of corn and soybeans.

In Minnesota, the Star Tribune reported in August that, “the Canadian Pacific Railway, one of two key railroads that serve Minnesota farmers, isn’t making enough progress in shipping a huge backlog of grain.”[30] The USDA reported that, “Grain elevators in some locations, such as South Dakota and Minnesota, could run out of storage capacity during the upcoming harvest, requiring grain be stored on the ground and running the risk of spoiling. The projected size of the upcoming harvest creates a high potential for loss in the affected states.”[31]

[29] Doering, Christopher, “Farmers, ag businesses brace for rail delays” Des Moines Register, September 13, 2014
[30] Hughlett, Mike, “Grain shipments from Midwest remain slow.” StarTribune, August 11, 2014.
[31] *Ibid.*

Farmers and grain elevators in Illinois are watching the rail buildup of inventories this year. The Decatur newspaper reported in early September that, “the 2014 grain crop will exceed U.S. grain storage capacity by 694 million bushels. That is based on current USDA yield projections.” USDA Deputy Administrator Arthur Neal said, “South Dakota will not have any storage space for 20 percent of its 2014 corn, soybean and wheat crops.”[32]

According to the Neal, South Dakota isn't the only state with a storage shortage. Illinois is one of five other states where grain will be piled on the ground this fall because there is more than can be stored in grain bins either on the farm or at elevators. In fact, 3 percent of the Illinois crop will be in temporary storage on the ground, in a state that is a leader in having grain bins. Indiana and Missouri will be short of storage for 15 percent of their crops. Ohio, Michigan and Kentucky all will be putting 6 percent to 7 percent of their grain on the ground because of insufficient storage space.”

One solution to this growing problem is to build refineries near the oil fields, but that would only change the need from transporting crude oil to transporting processed oil. Another possible solution would be to expand the rail infrastructure. A third solution would be to build a pipeline to carry much of the Bakken oil to the refineries and free up rail system.

The Wahpeton, North Dakota Daily News story on September 9, 2012 pointed out that, “Some within the ag industry are calling for a pipeline to be built to take the stress off the overburdened rail lines. Last Thursday the Surface Transportation Board held a public hearing in Fargo to provide the opportunity for people and businesses to report on service problems within the U.S. rail network. The question of creating a pipeline has arisen repeatedly by agricultural officials hoping to lessen the severity of the backlog.”[33]

[32] Ellis, Stu, “Farmers’ loss is foreign market’s gain.” Herald and Review, September 17, 2014.
[33] Speidel, Karen, “Experts suggest a pipeline to relieve rail issues.” Daily News, September 19,2014

7.0 Transportation Cost, Accident Risk, and Other Considerations

7.1 Transportation Cost Differences between Pipeline and Railroad

The rapid pace at which oil production ramped up in North Dakota rising from only 10,297 barrels per day at the beginning of 2007 to over a million barrels per day by June 2014 has put a great strain on the state's transportation infrastructure.[34] Existing pipeline capacity equaled only 583,000 barrels per day at the end of 2013.[35] This has forced oil producers to rely on rail to handle over 60% of shipments out of the state.[36]

Also, only limited refinery capacity exists in North Dakota at the present time, and this is not likely to change for the foreseeable future. The Tesoro Mandan refinery located near Bismarck can process up to 60,000 barrels per day. Two new 20,000 barrels per day capacity refineries are planned at Trenton and Dakota Prairie, but these are intended to produce only diesel and kerosene to satisfy local demands.[37] Generally, the transportation of crude oil by pipeline is less expensive than by railroad on a per barrel mile basis. But market opportunities as well as cost and capacity constraints influence transportation choices made by oil producers in the Bakken region.

According to transportation cost information included in a February 2014 investors' presentation by Kodiak Oil & Gas, it costs $5 per barrel to transport crude oil from North Dakota to Cushing, OK by pipeline and from Cushing to the Gulf it cost another $4 per barrel via the Seaway pipeline. At the same time it cost between $10 and $12 per barrel to move oil by railroad from North Dakota to the Gulf. So, last February pipeline offered a $1 to $3 per barrel savings over railroad for this particular movement of oil.[38]

Other information included in this presentation shows that rail transport from North Dakota to Anacortes, WA costs $9 to $10 per barrel, from North Dakota to the East Coast cost $14 to $17 per barrel, and North Dakota to California cost between $13 and $15 per barrel. Beyond the shipping costs oil movements by railroad incur additional costs associated with terminal charges ($2 per barrel), tank car leases ($2 per barrel), and shrinkage ($1 per barrel).[39]

---

[34] North Dakota Industrial Commission, Oil and Gas Division, historical monthly oil production statistics (accessed on October 17, 2014 at https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp)
[35] North Dakota Pipeline Authority, US Williston Basin Crude Oil Export Options (accessed on October 17, 2014 at http://northdakotapipelines.com/datastatistics/)
[36] Energy Information Administration, "Rail deliveries of U.S. oil to increase in 2014" (August 28, 2014).
[37] Energy Information Administration, "Rising North Dakota oil production and demand spur two new refineries" (March 27, 2013).
[38] Kodiak Oil & Gas, Investor presentation (February 2014), p. 15; Callum Turcan, "Is a major derailment looming for our nation's railroads," The Motley Fool (April 12, 2014)
[39] Sandy Fielden, "Crude loves rock'n'rail – Brent, WTI and the impact on Bakken netbacks," RBN Energy (May 5, 2013).

Truck transportation plays a limited but important role in moving crude oil from production areas to rail terminals. During 2013 trucks handled about 64% of this gathering function, while pipelines handled the remaining 36%. These truck movements cost about $3 per barrel compared to $2 per barrel for pipeline.[40]

One reason railroads became an attractive transportation alternative for North Dakota oil producers has to do with differences in the prices of West Texas Intermediate (WTI) and Brent crude. Due to transportation bottlenecks at Cushing, OK a large differential existed between the Brent and WTI prices from the beginning of 2011 through the first quarter of 2013.[41] For example, during all of 2012 the differential equaled $17.61 per barrel and reached as high as $24.87 per barrel during October of that year. Nationwide railroad carloads of crude oil jumped from 65,751 during 2011 to 233,698 (a 255.4% increase) during 2012 and to 407,761 (another 74.4% increase) during 2013.[42]

From December 2009 to January 2013 inventories of crude stored at Cushing, OK rose from 34.5 million barrels to 51.9 million barrels. Over the same period the differential between Brent and WTI (Brent minus WTI price) crude went from -$1.48 per barrel to $23.19 per barrel. Since peaking Cushing, OK crude inventories have dropped to about 21 million barrels at the end of October 2014, and the Brent to WTI price differential has dropped to around $5 per barrel.[43]

One major reason for the changes is the completion of the repurposing of the Seaway crude pipeline from Cushing to Freeport, Texas. Previously this pipeline moved oil into Cushing. Now it moves oil away from Cushing. This repurposed pipeline went into service in June 2012 with a capacity of 150,000 barrels per day. Following pumping station additions and modifications the capacity increased to 400,000 barrels per day at the beginning of 2013. Further improvements will raise capacity to about 850,000 barrels per day.[44] Another pipeline project by TransCanada (Gulf Coast Pipeline) will add up to an additional 830,000 barrels per day of capacity for moving crude from Cushing, OK to Nederland, Texas.[45] These improvements should reduce the likelihood of future shipping bottlenecks at Cushing and minimize this as a factor for growth in the Brent – WTI price differential.

When the Brent – WTI price differential falls below $5 per barrel, East and West Coast refineries served

---

[40] Sandy Fielden, "Crude loves rock'n'rail – Brent, WTI and the Impact on Bakken netbacks," RBN Energy (May 5, 2013)

[41] Cushing, OK serves as the pricing location for West Texas Intermediate (WTI) crude. This is because Cushing hosts that largest amount of oil storage facilities in the county totaling 46.3 million barrels. For this reason Cushing is a major transportation hub for oil shipments, particularly for pipelines.

[42] Association of American Railroads, "Moving crude oil by rail," (September 2014), p. 4.

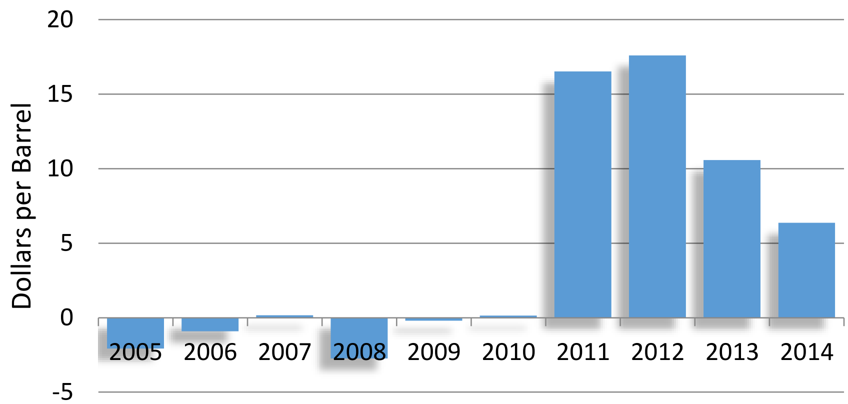
[43] Brent and WTI prices are from the Federal Reserve Bank of St. Louis FRED Economic data internet site accessed November 9, 2014 (http://research.stlouisfed.org/fred2/).; Cushing, OK crude oil inventory data are from the Energy Information Administration Internet site accessed November 9, 2014 (http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPC0_SAX_YCUOK_MBBL&f=W).

[44] "About Seaway," accessed on October 18,2014 (http://www.seawaypipeline.com/)

[45] TransCanada, "About Gulf Coast Pipeline Project," accessed November 9, 2014 (http://www.gulf-coast-pipeline.com/about/the-projects/)

by railroad become less attractive to Bakken oil producers than do Gulf Coast refineries served by pipeline.[46] Figure 10 shows the historical Brent – WTI price differential from 2005 through 2014 year-to-date.

Figure 10. Historical Brent-to-WTI Crude Oil Price Differentials



Source: Energy Information Administration, Strategic Economics Group

7.2 Pipeline and Railroad Accident Risk

Both pipelines and railroads have experienced major accidents involving large spills of crude oil in recent years. The most damaging pipeline accident in recent years occurred in Marshall, MI during July 2010 when a 30-inch pipeline owned by Enbridge Energy ruptured spilling 843,000 gallons of heavy crude (diluted bitumen). Cleanup costs associated with this spill totaled approximately $1 Billion.[47]
The most spectacular of the railroad accidents involving crude oil occurred on July 6, 2013 on Lac-Megantic, Quebec. This accident involved 72 tanks cars each loaded with 30,000 gallons of Bakken crude oil. The accident claimed 47 lives and destroyed 30 buildings. The cleanup from this accident is expected to take 5 years.[48]

In spite of some catastrophic accidents both pipelines and railroads generally have good records carrying hazardous materials. The Association of American Railroads on its Internet site states that 99.997% of hazardous materials shipments reach their destinations without incident.[49] Similarly, the American

[46] Sandy Fielden, "Crude Loves Rock'n'Rail – Brent, WTI and the Impact on Bakken Netbacks," (http://rbnenergy.com/taxonomy/term/107/feed).
[47] Rosemary Parker, "Enbridge oil cleanup on Kalamazoo Rover finished, all sections of the river open for public use," MLive.com (October 9, 2014).
[48] Wikipedia, "Lac-Megantic derailment" accessed October 19, 2014 (http://en.wikipedia.org/wiki/Lac-M%C3%A9gantic_derailment).
[49] Association of American Railroads, Internet site accessed on October 19, 2014 (https://www.aar.org/safety/Pages/default.aspx).

Pipeline Institute states that during 2013 99.999% of the 14 billion barrels of crude oil and petroleum products transported reached their destinations safely.[50] Accident rates involving crude oil have increased as domestic oil production has increased in recent years. But relative to the amount of product being moved, safety has improved.

Comparing the two modes of transportation, pipelines appear to be the safer mode. For example, statistics revealed by the U.S. Pipeline and Hazardous Materials Safety Administration shows that during 2013 the number of gallons of oil spilled by railroads exceeded the 800,000 gallons spilled during all the years from 1975 to 2010 in the railroad industry.[51] Federal regulators have proposed new standards for railroad tank cars to make them less likely to rupture in an accident. These regulations would raise railroad rates for crude oil movements from 2.2% to 3.6%.[52]

For pipelines the U.S. Pipeline and Hazardous Materials Safety Administration reports that during 2013 there were 401 reported incidents that involved 119,290 barrels of hazardous liquids and caused property damage totaling $266.7 million and resulted in one fatality and 5 injuries. Based on Federal Energy Regulatory Commission annual statistical reports hazardous liquid pipelines carried 8.1 Billion barrels of crude oil and 6.5 Billion barrels of petroleum products during 2013 and collected $15.7 billion in operating revenues on these shipments. Over the past five years (2009 to 2013) the number of pipeline incidents involving hazardous liquids equaled 361 resulting in spills averaging 81,971 barrels and damages of $348.3 Million. So, pipeline accidents involved a very small amount of the product moved.

Comparing accidents for pipelines and railroads finds that accident rates for both are low. With a few notable exceptions the average spill amounts for each incident are small. However, when catastrophic failures occur for pipelines the size of the spill can be large. However, monitoring equipment installed on newer pipelines makes the detection of leaks sooner than for older facilities. On the other hand, because railroads pass through cities and catastrophic accidents generally happen due to derailments while trains are in motion, property damage as well as fatality and injury counts are much greater than those that occur for pipeline accidents.

7.3 Other Economic Impacts

Beyond the localized impacts in areas where the extraction of oil has dramatically increased, the growth in domestic oil production is having significant impacts on the nation's overall economy. Since 2005 average monthly crude oil imports have dropped by 85.4 million barrels (27.7%). During 2005 crude oil imports averaged 308.0 Million barrel per month. Through the first seven months of 2014 the average

---

[50] American Pipeline Institute, Internet site accessed October 19, 2014 (http://www.pipeline101.com/are-pipelines-safe/what-is-the-safety-record).
[51] "US railroad oil spills in 2013 surpassed previous four decades combined," RT.com (January 23,2014).
[52] Tom Bokowy, "DOT impact on crude by rail," Cost & Capital (July 2014), p. 4.

was down to 222.6 Million barrels per month.[53]

As the volume of oil imports has declined so has the flow of dollars out of the United States to pay for oil. Comparing the first eight months of 2011 and 2014 the cost of imported oil has dropped from $220.7 Billion to $171.7 Billion, which equals a decrease of $49.0 Billion (22.2%). This decrease has positive spillover impacts on the value of the dollar, domestic purchases of other goods and services, and on the rate of inflation.[54]

Increased pipeline capacity in the Bakken area of North Dakota will provide support for these positive trends associated with the growth of domestic oil production. For example, over the past year the average price of a gallon of regular gasoline has dropped from $3.31 to $3.07, and the price is likely to drop further. This current year-over-year drop in price means households are saving about $33 billion per year on motor fuel purchases. Similarly, businesses are benefiting from a 29-cent per gallon drop in the price of diesel fuel, which translates to about an $11.2 billion savings nationwide.

As additional pipeline capacity comes online in North Dakota increased market options and lower transportation costs will mean about another 10-cents per gallon decrease in motor fuel and diesel prices. At current levels of motor fuel sales (135.6 Billion gallons/year) and diesel fuel sales (38.5 Billion gallons/year) the additional savings will equal about $17.4 Billion nationally per year. Drivers in all states will benefit. These potential annual savings to the four states through which the Dakota Access Pipeline will pass equal $84.6 Million for North Dakota, $67.1 Million for South Dakota, $230.8 Million for Iowa, and $613.2 Million for Illinois.

[53] Energy Information Administration
[54] U.S. Census Bureau

8.0 Brief Summary of Findings

8.1 Construction Stage

During the two-year construction stage of the project the four-state region will experience an increase in production and sales of more than $4.9 Billion, an increase in personal income more than $1.9 Billion and an increase of nearly 33,000 job-years. The fiscal impact on the four states will collectively be about $128 Million in sales, use, gross receipts and lodging taxes and an increase in income taxes of nearly $28 Million.

Table 31. Summary Economic & Fiscal Impact Measures - Construction Stage

Measure	Region	North Dakota	South Dakota	Iowa	Illinois
Economic Measures					
Production and Sales ($Millions)	$4,962.12	$1,052.86	$835.84	$1,088.74	$753.35
Income ($Millions)	$1,934.39	$450.35	$302.82	$390.34	$303.30
Employment (Job-Years)	32,721	7,688	7,137	7,623	5,009
Fiscal Measures					
Sales, Gross Receipts and Lodging Taxes ($Millions)	$127.86	$34.59	$38.53	$35.33	$19.42
Individual Income Taxes ($Millions)	$28.15	$5.90	$0.00	$14.57	$7.68
Property Taxes ($Millions)	$0.00	$0.00	$0.00	$0.00	$0.00

Source: Strategic Economics Group

8.2 Operations and Maintenance Stage

Once the pipeline is in operation, after 2016, the economic impact will be small. The total impact on the four-state region will be an increase in production and sales of about $140 Million, generating an increase in personal income of about $11 Million and 160 permanent operations and maintenance jobs. However, the pipeline will generate considerable ongoing tax revenues. North Dakota, South Dakota and Iowa will see an increase in local property taxes. During the first year of operation these revenues are estimated at $13.1 Million, $13.5 Million and $27.4 Million, respectively. Illinois will realize less than $1 million per year in additional property taxes because it does not tax most pipeline infrastructure. Collectively, the four states will see an increase each year in sales, use, gross receipts and lodging taxes of about $595,000 and $214,000 in income taxes.[55]

[55] Except South Dakota which does have an income tax.

Table 32. Summary Economic & Fiscal Impact Measures - Operations & Maintenance Stage

Measure	Region	North Dakota	South Dakota	Iowa	Illinois
Economic Measures					
Production and Sales ($Millions)	$140.28	$29.53	$53.63	$44.08	$13.05
Income ($Millions)	$11.01	$4.42	$1.95	$1.67	$1.51
Employment (Jobs)	160	66	31	25	20
Fiscal Measures					
Sales, Gross Receipts and Lodging Taxes	$595,000	$158,000	$197,000	$190,000	$50,000
Individual Income Taxes	$214,000	$84,000	$0	$85,000	$45,000
Property Taxes ($Millions)	$55.62	$13.37	$13.73	$27.68	$0.84

Source: Strategic Economics Group

8.3 Other Factors that Will Be Impacted By the Pipeline

Transportation issues have created a substantial need for this pipeline.

- Currently, a large share of oil from the Bakken area is transported to refineries by railroad, causing a bottleneck in the Dakotas and Minnesota for farmers who need the same tracks and engines to take their crops to markets. As a result farm commodities have exceeded the local storage capacity, causing grain and soybean storage prices to rise or farm income to fall.

- Railroad bottlenecks have also been reflected in a price reduction for Bakken oil to account for the added transportation cost.

- The transportation of crude oil by is generally less expensive by pipeline than by railroad. The cost of moving oil from the Bakken area of North Dakota to Gulf Coast refineries during 2013 cost between $1 and $3 per barrel less by pipeline than by railroad.

- Both pipelines and railroads have experienced some spectacular accidents in recent years. But overall the safety records of both modes of hazardous materials transportation are very good. Over the past five years pipeline spills have averaged only about 82,000 barrels per year while delivering an average of 13.7 Billion barrels per year of hazardous liquids.

- The growth of domestic oil production has exerted significant downward pressure on world oil prices. As of mid-October both Brent and WTI crude are trading at less than $90 per barrel.

- Since 2005 U.S. oil imports of oil have dropped by 27.7% and since 2011 U.S. expenditures on oil imports have dropped by 22.2%. These decreases are benefiting the country through reduced foreign trade deficits, a stronger dollar, and lower inflation.

- As additional pipeline capacity comes online in North Dakota increased market options and lower transportation costs will mean additional decreases in motor fuel and diesel prices.

Appendix 1 – Glossary of Terms

Term	Definition
Backward linkage	The interconnection of an industry to other industries from which it purchases its inputs in order to produce its output. An industry has significant backward linkages when its production of output requires substantial intermediate inputs from many other industries. (BEA)
Compensation of employees	Compensation of employees is the total remuneration, in cash or in kind, payable by enterprises to employees in return for work done by the latter during the accounting period. (SNA) See Employee Compensation.
Direct effects	It is a series of production changes or expenditures made by producers/consumers as a result of an activity or policy. Applying these initial changes to the multipliers in an IMPLAN model will then display how the region will respond, economically to these initial changes.
Employee Compensation	Employee Compensation in IMPLAN is the total payroll cost of the employee paid by the employer. This includes wage and salary, all benefits (e.g., health, retirement) and payroll taxes (both sides of social security, unemployment taxes, etc.)
Employment multipliers	I-O multipliers used to estimate the total number of jobs (both full-time and part-time) throughout the economy that are needed, directly and indirectly, to deliver $1 million of final demand for a specific commodity. (BEA)
Earnings multipliers	I-O ratios that measure earnings paid to households by employment throughout the economy, directly and indirectly, in connection with delivery of $1 million of final demand for a specific commodity. (BEA)
Excise taxes	Taxes that are levied by units of government on the manufacture, sale, or consumption of specific items, usually on a per-unit basis rather than a percentage basis. For example, cigarettes are taxed by the pack or carton, alcoholic beverages are taxed by the bottle, and gasoline is taxed by the gallon. Excise taxes are a type of commodity tax. (BEA)
Final Demand	The value of goods & services produced and sold to final users (institutions) during the calendar year. This value is also equivalent to the Direct Effect of the impact.
Forward linkage	The interconnection of an industry to other industries to which it sells its outputs. It is measured as the row sum of the direct requirements table (direct forward linkage) or as the row sum of the total requirements table (total forward linkage). An industry has significant forward linkages when a substantial amount of its output is used by other industries as intermediate inputs to their production. (BEA)

Term	Definition
Indirect business taxes (IBT)	In general terms, IBT can currently be considered the combination of excise, sales and property taxes, as well as, fees, fines, licenses and permits.
Indirect effects	The impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to value added.
Induced effects	The response by an economy to an initial change (direct effect) that occurs through re-spending of income received by a component of value added. IMPLAN's default multiplier recognizes that labor income (employee compensation and proprietor income components of value added) is not a leakage to the regional economy. This money is recirculated through the household spending patterns causing further local economic activity.
I-O analysis	A type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy. More particularly, it measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands. (BEA)
Jobs	A job in IMPLAN = the annual average of monthly jobs in that industry (this is the same definition used by QCEW, BLS, and BEA nationally). Thus, 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time.
Job-Year	Equals one full-time job lasting for one year.
Labor Income	All forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.
Multipliers	It is the ratio of Total Production to initial Direct Inputs. Multipliers may be constructed for output, employment, and every component of Value Added.
Multi-regional Analysis	A method for determining economic impacts in two or more regions caused by sales to Final Demand in one region.
Output	Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production = sales. For Retail and wholesale trade, output = gross margin and not gross sales.

Output multipliers	Derived from the I-O total requirements tables, the output multipliers show the amount of output required to satisfy a given level of final-use expenditures. For the commodity-by-commodity total requirements table, it is the production required both directly and indirectly of the commodity at the beginning of each row per dollar of delivery to final use of the commodity at the top of the column. For the industry-by-commodity total requirements table, it is the industry output required to deliver a dollar of a commodity to final users. For the industry-by-industry total requirements table, it is the industry output required to deliver a dollar of industry output to final users. (BEA)
Proprietor income	Proprietor income consists of payments received by self-employed individuals and unincorporated business owners. This income also includes the capital consumption allowance and is recorded on Federal Tax form 1040C.
Regional Purchase Coefficient	A Regional Purchase Coefficient (RPC) is the proportion of the total demand for a commodity by all users in the Study Area that is supplied by producers located within the Study Area. For example, if the RPC for the commodity fish is 0.8, then 80% of the demand by local fish processors, fish wholesalers, and other fish consumers are met by local fish producers. Conversely, 20% (1.0-RPC) of the demand for fish is satisfied by imports. (IMPLAN)
Trade Flow	The flow of goods & services between or within counties, or user-defined study areas within the U.S.
Value added	The difference between total output of an industry or establishment and the cost of its intermediate inputs.

Source: IMPLAN Group LLC

Appendix 2 – Detailed Tables for the Four-State Region

The first four tables identify the economic impacts of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the region. All dollar amounts are in 2016 dollars.

Table 2.1 Pipeline Construction Economic Impact on the Region

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	15,879	$1,016.83	$2,462.95
Indirect Effect	6,362	$419.47	$1,092.11
Induced Effect	10,481	$498.10	$1,407.07
Total Effect	32,721	$1,934.39	$4,962.12
Sector			
Agriculture	37	$3.20	$10.10
Mining	778	$76.25	$145.29
Construction	13,030	$786.49	$1,747.87
Manufacturing	1,455	$109.61	$688.92
TIPU	651	$43.78	$141.85
Trade	2,995	$135.17	$306.26
Service	13,593	$764.95	$1,896.17
Government	182	$14.94	$25.65
Total	32,721	$1,934.39	$4,962.12

Source: Strategic Economics Group, IMPLAN Model

Table 2.2 Impact on Employment of Pipeline Construction in the Region

Description	Direct	Indirect	Induced	Total
Total	15,879	6,362	10,481	32,721
Agriculture	0	6	31	37
Mining	700	72	5	778
Construction	12,856	108	67	13,030
Manufacturing	666	619	171	1,455
TIPU	0	350	301	651
Trade	0	708	2,287	2,995
Service	1,657	4,444	7,492	13,593
Government	0	55	127	182

Source: Strategic Economics Group, IMPLAN Model

Table 2.3 Impact on Labor Income of Pipeline Construction in the Region ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$1,016.83	$419.47	$498.10	$1,934.39
Agriculture	$0.00	$0.65	$2.55	$3.20
Mining	$71.12	$4.91	$0.22	$76.25
Construction	$774.78	$6.79	$4.93	$786.49
Manufacturing	$49.59	$46.88	$13.14	$109.61
TIPU	$0.00	$23.30	$20.48	$43.78
Trade	$0.00	$43.03	$92.14	$135.17
Service	$121.34	$289.50	$354.11	$764.95
Government	$0.00	$4.40	$10.53	$14.94

Source: Strategic Economics Group, IMPLAN Model

Table 2.4 Impact on Output of Pipeline Construction in the Region ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$2,462.95	$1,092.11	$1,407.07	$4,962.12
Agriculture	$0.00	$1.58	$8.52	$10.10
Mining	$128.09	$15.83	$1.38	$145.29
Construction	$1,724.53	$13.07	$10.27	$1,747.87
Manufacturing	$323.16	$265.42	$100.35	$688.92
TIPU	$0.00	$73.26	$68.60	$141.85
Trade	$0.00	$101.25	$205.01	$306.26
Service	$287.17	$614.51	$994.49	$1,896.17
Government	$0.00	$7.19	$18.46	$25.65

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 2.5 Pipeline Operations Economic Impact of the Region

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	89	$7.358	$12.991
Indirect Effect	18	$1.114	$2.976
Induced Effect	53	$2.535	$7.164
Total Effect	160	$11.007	$23.131
Sector			
Agriculture	0	$0.014	$0.047
Mining	0	$0.002	$0.010
Construction	1	$0.046	$0.093
Manufacturing	2	$0.162	$1.009
TIPU	3	$0.172	$0.564
Trade	13	$0.563	$1.274
Service	141	$9.962	$19.983
Government	1	$0.087	$0.150
Total	160	$11.007	$23.131

Source: Strategic Economics Group, IMPLAN Model

Table 2.6 Employment Impact of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	89	18	53	160
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	1
Manufacturing	0	1	1	2
TIPU	0	1	2	3
Trade	0	1	12	13
Service	89	14	38	141
Government	0	0	1	1

Source: Strategic Economics Group, IMPLAN Model

Table 2.7 Labor Income of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	$7,358,042	$1,114,003	$2,535,443	$11,007,488
Agriculture	$0	$1,012	$12,995	$14,007
Mining	$0	$626	$1,113	$1,739
Construction	$0	$21,327	$25,093	$46,420
Manufacturing	$0	$94,921	$66,890	$161,811
TIPU	$0	$67,257	$104,479	$171,736
Trade	$0	$93,473	$469,404	$562,878
Service	$7,358,042	$801,870	$1,801,750	$9,961,662
Government	$0	$33,516	$53,718	$87,235

Source: Strategic Economics Group, IMPLAN Model

Table 2.8 Output Impact of the Pipeline Operations in the Region

Description	Direct	Indirect	Induced	Total
Total	$12,990,999	$2,975,933	$7,164,021	$23,130,953
Agriculture	$0	$3,310	$43,305	$46,615
Mining	$0	$3,349	$7,010	$10,359
Construction	$0	$40,995	$52,314	$93,309
Manufacturing	$0	$498,281	$510,809	$1,009,090
TIPU	$0	$213,956	$350,275	$564,231
Trade	$0	$229,640	$1,044,842	$1,274,482
Service	$12,990,999	$1,930,791	$5,061,240	$19,983,030
Government	$0	$55,612	$94,226	$149,837

Source: Strategic Economics Group, IMPLAN Model

Appendix 3 - Detail Tables for North Dakota

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of North Dakota. All dollar amounts are in 2016 dollars.

Table 3.1 Pipeline Construction Economic Impact on North Dakota

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	4,565	$306.14	$655.93
Indirect Effect	1,157	$66.93	$168.20
Induced Effect	1,966	$77.27	$228.73
Total Effect	7,688	$450.35	$1,052.86
Sector			
Agriculture	6	$0.62	$1.39
Mining	212	$22.46	$39.58
Construction	3,828	$248.70	$509.95
Manufacturing	269	$17.18	$78.36
TIPU	105	$8.07	$24.21
Trade	663	$28.25	$66.26
Service	2,562	$122.58	$327.45
Government	44	$2.48	$5.65
Total	7,688	$450.35	$1,052.86

Source: Strategic Economics Group, IMPLAN Model

Table 3.2 Impact on Employment of Pipeline Construction in North Dakota

Description	Direct	Indirect	Induced	Total
Total	4,565	1,157	1,966	7,688
Agriculture	0	0	5	6
Mining	205	7	0	212
Construction	3,788	24	15	3,828
Manufacturing	179	78	12	269
TIPU	0	59	46	105
Trade	0	176	487	663
Service	393	800	1,369	2,562
Government	0	13	30	44

Source: Strategic Economics Group, IMPLAN Model

Table 3.3 Impact on Labor Income of Pipeline Construction in North Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$306.14	$66.93	$77.27	$450.35
Agriculture	$0.00	$0.04	$0.58	$0.62
Mining	$21.80	$0.64	$0.02	$22.46
Construction	$245.69	$1.68	$1.33	$248.70
Manufacturing	$11.84	$4.71	$0.63	$17.18
TIPU	$0.00	$4.67	$3.40	$8.07
Trade	$0.00	$9.60	$18.65	$28.25
Service	$26.81	$44.86	$50.91	$122.58
Government	$0.00	$0.73	$1.74	$2.48

Source: Strategic Economics Group, IMPLAN Model

Table 3.4 Impact on Output of Pipeline Construction in North Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$655.93	$168.20	$228.73	$1,052.86
Agriculture	$0.00	$0.12	$1.28	$1.39
Mining	$38.08	$1.44	$0.07	$39.58
Construction	$504.67	$2.95	$2.33	$509.95
Manufacturing	$51.53	$21.26	$5.57	$78.36
TIPU	$0.00	$13.32	$10.90	$24.21
Trade	$0.00	$23.35	$42.91	$66.26
Service	$61.66	$104.20	$161.59	$327.45
Government	$0.00	$1.57	$4.08	$5.65

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 3.5 Pipeline Operations Economic Impact on North Dakota

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	43	$3.478	$6.148
Indirect Effect	6	$0.275	$0.792
Induced Effect	17	$0.669	$1.979
Total Effect	66	$4.422	$8.920
Sector			
Agriculture	0	$0.005	$0.012
Mining	0	$0.000	$0.001
Construction	0	$0.024	$0.041
Manufacturing	0	$0.009	$0.069
TIPU	1	$0.051	$0.163
Trade	5	$0.201	$0.474
Service	59	$4.104	$8.098
Government	0	$0.028	$0.061
Total	66	$4.422	$8.920

Source: Strategic Economics Group, IMPLAN Model

Table 3.6 Employment Impact of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	43	6	17	66
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	1
Trade	0	1	4	5
Service	43	5	12	59
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 3.7 Labor Income of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	$3,478,018	$275,468	$668,639	$4,422,125
Agriculture	$0	$212	$4,998	$5,210
Mining	$0	$185	$171	$357
Construction	$0	$11,969	$11,550	$23,519
Manufacturing	$0	$3,840	$5,446	$9,287
TIPU	$0	$21,433	$29,487	$50,919
Trade	$0	$39,409	$161,590	$201,000
Service	$3,478,018	$185,785	$440,260	$4,104,063
Government	$0	$12,634	$15,136	$27,770

Source: Strategic Economics Group, IMPLAN Model

Table 3.8 Output Impact of the Pipeline Operations in North Dakota

Description	Direct	Indirect	Induced	Total
Total	$6,148,500	$792,352	$1,978,792	$8,919,644
Agriculture	$0	$619	$11,048	$11,668
Mining	$0	$497	$591	$1,088
Construction	$0	$21,082	$20,212	$41,294
Manufacturing	$0	$21,256	$48,136	$69,392
TIPU	$0	$68,794	$94,679	$163,473
Trade	$0	$101,581	$371,984	$473,566
Service	$6,148,500	$552,538	$1,396,700	$8,097,738
Government	$0	$25,983	$35,442	$61,425

Source: Strategic Economics Group, IMPLAN Model

Appendix 4 – Detail Tables for South Dakota

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of South Dakota. All dollar amounts are in 2016 dollars.

Table 4.1. Pipeline Construction Economic Impact on South Dakota

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	4,199	$182.65	$485.62
Indirect Effect	1,291	$58.59	$164.05
Induced Effect	1,646	$61.57	$186.17
Total Effect	7,137	$302.82	$835.84
Sector			
Agriculture	6	$0.79	$1.80
Mining	161	$4.20	$21.16
Construction	3,694	$163.71	$416.83
Manufacturing	135	$7.42	$41.26
TIPU	103	$5.82	$20.69
Trade	562	$21.61	$53.31
Service	2,425	$97.03	$275.90
Government	50	$2.23	$4.90
Total	7,137	$302.82	$835.84

Source: Strategic Economics Group, IMPLAN Model

Table 4.2 Impact on Employment of Pipeline Construction in South Dakota

Description	Direct	Indirect	Induced	Total
Total	4,199	1,291	1,646	7,137
Agriculture	0	2	4	6
Mining	147	14	1	161
Construction	3,656	25	14	3,694
Manufacturing	21	98	16	135
TIPU	0	64	39	103
Trade	0	173	389	562
Service	376	898	1,151	2,425
Government	0	17	33	50

Source: Strategic Economics Group, IMPLAN Model

Table 4.3 Impact on Labor Income of Pipeline Construction in South Dakota ()$Millions)

Description	Direct	Indirect	Induced	Total
Total	$182.65	$58.59	$61.57	$302.82
Agriculture	$0.00	$0.28	$0.51	$0.79
Mining	$3.53	$0.66	$0.01	$4.20
Construction	$161.73	$1.16	$0.82	$163.71
Manufacturing	$1.26	$5.31	$0.85	$7.42
TIPU	$0.00	$3.61	$2.22	$5.82
Trade	$0.00	$8.12	$13.48	$21.61
Service	$16.12	$38.65	$42.25	$97.03
Government	$0.00	$0.80	$1.43	$2.23

Source: Strategic Economics Group, IMPLAN Model

Table 4.4 Impact on Output of Pipeline Construction in South Dakota ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$485.62	$164.05	$186.17	$835.84
Agriculture	$0.00	$0.53	$1.26	$1.80
Mining	$18.36	$2.68	$0.11	$21.16
Construction	$412.71	$2.48	$1.64	$416.83
Manufacturing	$11.27	$24.37	$5.62	$41.26
TIPU	$0.00	$11.97	$8.72	$20.69
Trade	$0.00	$20.89	$32.41	$53.31
Service	$43.26	$99.50	$133.15	$275.90
Government	$0.00	$1.63	$3.26	$4.90

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 4.5 Pipeline Operations Economic Impact on South Dakota

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	19	$1.469	$2.759
Indirect Effect	3	$0.141	$0.432
Induced Effect	9	$0.339	$1.025
Total Effect	31	$1.950	$4.217
Sector			
Agriculture	0	$0.003	$0.007
Mining	0	$0.000	$0.001
Construction	0	$0.009	$0.019
Manufacturing	0	$0.009	$0.051
TIPU	0	$0.022	$0.086
Trade	2	$0.092	$0.229
Service	28	$1.799	$3.791
Government	0	$0.015	$0.032
Total	31	$1.950	$4.217

Source: Strategic Economics Group, IMPLAN Model

Table 4.6 Employment Impact of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	19	3	9	31
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	2	2
Service	19	3	6	28
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 4.7 Labor Income of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	$1,469,452	$141,228	$339,219	$1,949,899
Agriculture	$0	$213	$2,805	$3,018
Mining	$0	$52	$77	$129
Construction	$0	$4,543	$4,496	$9,039
Manufacturing	$0	$4,205	$4,692	$8,898
TIPU	$0	$10,132	$12,234	$22,367
Trade	$0	$17,953	$74,391	$92,344
Service	$1,469,452	$97,296	$232,640	$1,799,388
Government	$0	$6,833	$7,884	$14,717

Source: Strategic Economics Group, IMPLAN Model

Table 4.8 Output Impact of the Pipeline Operations in South Dakota

Description	Direct	Indirect	Induced	Total
Total	$2,759,000	$432,305	$1,025,303	$4,216,608
Agriculture	$0	$500	$6,954	$7,454
Mining	$0	$412	$619	$1,031
Construction	$0	$9,749	$9,038	$18,787
Manufacturing	$0	$20,368	$30,923	$51,290
TIPU	$0	$37,766	$48,280	$86,046
Trade	$0	$49,917	$178,998	$228,915
Service	$2,759,000	$300,058	$732,433	$3,791,491
Government	$0	$13,535	$18,058	$31,593

Source: Strategic Economics Group, IMPLAN Model

Appendix 5 – Detail Tables for Iowa

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of Iowa. All dollar amounts are in 2016 dollars.

Table 5.1 Pipeline Construction Economic Impact on Iowa

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	3,998	$229.82	$628.43
Indirect Effect	1,520	$79.46	$209.77
Induced Effect	2,104	$81.06	$250.54
Total Effect	7,623	$390.34	$1,088.74
Sector			
Agriculture	8	$0.63	$2.28
Mining	89	$3.77	$12.84
Construction	3,564	$206.80	$539.50
Manufacturing	185	$12.54	$76.26
TIPU	130	$7.50	$26.02
Trade	743	$28.66	$65.83
Service	2,866	$127.77	$360.51
Government	37	$2.66	$5.49
Total	7,623	$390.34	$1,088.74

Source: Strategic Economics Group, IMPLAN Model

Table 5.2 Impact on Employment of Pipeline Construction in Iowa

Description	Direct	Indirect	Induced	Total
Total	3,998	1,520	2,104	7,623
Agriculture	0	2	6	8
Mining	60	28	0	89
Construction	3,524	26	14	3,564
Manufacturing	39	121	25	185
TIPU	0	82	49	130
Trade	0	219	524	743
Service	374	1,030	1,461	2,866
Government	0	13	25	37

Source: Strategic Economics Group, IMPLAN Model

Table 5.3 Impact on Labor Income of Pipeline Construction in Iowa ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$229.82	$79.46	$81.06	$390.34
Agriculture	$0.00	$0.14	$0.49	$0.63
Mining	$2.07	$1.67	$0.02	$3.77
Construction	$204.45	$1.51	$0.85	$206.80
Manufacturing	$3.21	$7.80	$1.53	$12.54
TIPU	$0.00	$4.64	$2.87	$7.50
Trade	$0.00	$10.39	$18.27	$28.66
Service	$20.09	$52.39	$55.29	$127.77
Government	$0.00	$0.92	$1.73	$2.66

Source: Strategic Economics Group, IMPLAN Model

Table 5.4 Impact on Output of Pipeline Construction in Iowa ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$628.43	$209.77	$250.54	$1,088.74
Agriculture	$0.00	$0.42	$1.87	$2.28
Mining	$8.99	$3.78	$0.06	$12.84
Construction	$533.38	$3.50	$2.63	$539.50
Manufacturing	$26.84	$37.10	$12.32	$76.26
TIPU	$0.00	$15.36	$10.66	$26.02
Trade	$0.00	$24.92	$40.92	$65.83
Service	$59.22	$122.93	$178.36	$360.51
Government	$0.00	$1.77	$3.72	$5.49

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 5.5 Pipeline Operations Economic Impact on Iowa

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	15	$1.250	$2.378
Indirect Effect	3	$0.127	$0.373
Induced Effect	8	$0.296	$0.916
Total Effect	25	$1.673	$3.667
Sector			
Agriculture	0	$0.002	$0.007
Mining	0	$0.000	$0.000
Construction	0	$0.007	$0.018
Manufacturing	0	$0.012	$0.081
TIPU	0	$0.019	$0.069
Trade	2	$0.080	$0.184
Service	22	$1.542	$3.284
Government	0	$0.012	$0.024
Total	25	$1.673	$3.667

Source: Strategic Economics Group, IMPLAN Model

Table 5.6 Employment Impact of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	15	3	8	25
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	2	2
Service	15	2	5	22
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 5.7 Labor Income of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	$1,250,133	$126,574	$296,129	$1,672,836
Agriculture	$0	$128	$1,789	$1,917
Mining	$0	$61	$87	$148
Construction	$0	$3,606	$3,120	$6,726
Manufacturing	$0	$6,090	$5,600	$11,690
TIPU	$0	$8,818	$10,503	$19,320
Trade	$0	$12,927	$66,835	$79,763
Service	$1,250,133	$89,553	$201,841	$1,541,527
Government	$0	$5,391	$6,354	$11,745

Source: Strategic Economics Group, IMPLAN Model

Table 5.8 Output Impact of the Pipeline Operations in Iowa

Description	Direct	Indirect	Induced	Total
Total	$2,378,000	$373,384	$915,701	$3,667,085
Agriculture	$0	$458	$6,820	$7,278
Mining	$0	$148	$235	$384
Construction	$0	$8,316	$9,613	$17,929
Manufacturing	$0	$35,990	$45,022	$81,012
TIPU	$0	$30,158	$39,181	$69,338
Trade	$0	$33,773	$149,797	$183,570
Service	$2,378,000	$254,579	$651,356	$3,283,935
Government	$0	$9,961	$13,677	$23,638

Appendix 6 – Detail Tables for Illinois

The first four tables identify the economic impact of the Dakota Access Pipeline project spending during the two-year construction stage and shows the effect within the state of Illinois. All dollar amounts are in 2016 dollars.

Table 6.1 Pipeline Construction Economic Impact on Illinois

Description	Employment (Job Years)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	2,482	$157.79	$366.57
Indirect Effect	919	$64.47	$164.42
Induced Effect	1,608	$81.04	$222.36
Total Effect	5,009	$303.30	$753.35
Sector			
Agriculture	3	$0.25	$0.74
Mining	86	$4.66	$14.34
Construction	2,115	$131.46	$277.39
Manufacturing	158	$13.24	$91.79
TIPU	97	$6.65	$21.44
Trade	431	$20.20	$45.18
Service	2,094	$124.50	$298.70
Government	25	$2.34	$3.77
Total	5,009	$303.30	$753.35

Source: Strategic Economics Group, IMPLAN Model

Table 6.2 Impact on Employment of Pipeline Construction in Illinois

Description	Direct	Indirect	Induced	Total
Total	2,482	919	1,608	5,009
Agriculture	0	1	3	3
Mining	76	9	1	86
Construction	2,092	14	9	2,115
Manufacturing	48	85	24	158
TIPU	0	49	47	97
Trade	0	96	335	431
Service	266	657	1,170	2,094
Government	0	7	18	25

Source: Strategic Economics Group, IMPLAN Model

Table 6.3 Impact on Labor Income of Pipeline Construction in Illinois ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$157.79	$64.47	$81.04	$303.30
Agriculture	$0.00	$0.05	$0.20	$0.25
Mining	$4.01	$0.62	$0.03	$4.66
Construction	$129.81	$0.94	$0.71	$131.46
Manufacturing	$4.23	$6.96	$2.04	$13.24
TIPU	$0.00	$3.34	$3.31	$6.65
Trade	$0.00	$6.06	$14.14	$20.20
Service	$19.74	$45.86	$58.90	$124.50
Government	$0.00	$0.64	$1.70	$2.34

Source: Strategic Economics Group, IMPLAN Model

Table 6.4 Impact on Output of Pipeline Construction in Illinois ($Millions)

Description	Direct	Indirect	Induced	Total
Total	$366.57	$164.42	$222.36	$753.35
Agriculture	$0.00	$0.16	$0.58	$0.74
Mining	$11.59	$2.50	$0.25	$14.34
Construction	$274.43	$1.70	$1.26	$277.39
Manufacturing	$35.79	$40.49	$15.51	$91.79
TIPU	$0.00	$10.45	$10.99	$21.44
Trade	$0.00	$13.98	$31.19	$45.18
Service	$44.77	$94.16	$159.78	$298.70
Government	$0.00	$0.98	$2.79	$3.77

Source: Strategic Economics Group, IMPLAN Model

The next four tables identify the economic impact of the operations and maintenance of the pipeline after it has been put in service in 2016 and beyond. The dollars identified in these tables are also in 2016 dollars.

Table 6.5 Pipeline Operations Economic Impact on Illinois

Description	Employment (Jobs)	Labor Income ($Millions)	Output ($Millions)
Impact Type			
Direct Effect	11	$0.995	$1.705
Indirect Effect	2	$0.154	$0.399
Induced Effect	7	$0.359	$0.985
Total Effect	20	$1.508	$3.090
Sector			
Agriculture	0	$0.001	$0.003
Mining	0	$0.000	$0.002
Construction	0	$0.006	$0.010
Manufacturing	0	$0.022	$0.136
TIPU	0	$0.024	$0.077
Trade	2	$0.075	$0.168
Service	18	$1.369	$2.675
Government	0	$0.012	$0.019
Total	20	$1.508	$3.090

Source: Strategic Economics Group, IMPLAN Model

Table 6.6 Employment Impact of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	11	2	7	20
Agriculture	0	0	0	0
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	0	0	0	0
TIPU	0	0	0	0
Trade	0	0	1	2
Service	11	2	5	18
Government	0	0	0	0

Source: Strategic Economics Group, IMPLAN Model

Table 6.7 Labor Income of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	$995,394	$154,090	$359,010	$1,508,493
Agriculture	$0	$60	$891	$952
Mining	$0	$66	$126	$192
Construction	$0	$2,630	$3,161	$5,791
Manufacturing	$0	$13,019	$9,049	$22,068
TIPU	$0	$8,979	$14,700	$23,679
Trade	$0	$12,262	$62,698	$74,960
Service	$995,394	$112,686	$260,833	$1,368,913
Government	$0	$4,387	$7,551	$11,939

Source: Strategic Economics Group, IMPLAN Model

Table 6.8 Output Impact of the Pipeline Operations in Illinois

Description	Direct	Indirect	Induced	Total
Total	$1,705,500	$399,022	$985,350	$3,089,873
Agriculture	$0	$223	$2,587	$2,810
Mining	$0	$473	$1,097	$1,570
Construction	$0	$4,768	$5,571	$10,339
Manufacturing	$0	$67,156	$68,721	$135,876
TIPU	$0	$28,251	$48,843	$77,094
Trade	$0	$29,474	$138,362	$167,836
Service	$1,705,500	$261,739	$707,770	$2,675,009
Government	$0	$6,939	$12,400	$19,338

Source: Strategic Economics Group, IMPLAN Model

Appendix 7 - Description of the IMPLAN Model[56]

IMPLAN is a widely-accepted and utilized software model. At the heart of the model is an input-output dollar flow table. For a specified region, the input-output table accounts for all dollar flows between different sectors of the economy. Using this information, IMPLAN models the way a dollar injected into one sector is spent and re-spent in other sectors of the economy, generating waves of economic activity, or so-called "economic multiplier" effects.

The model uses national industry data and county-level economic data to generate a series of multipliers which in turn estimate the total economic implications of economic activity. At the heart of the model is a national input-output dollar flow table called the Social Accounting Matrix (SAM). Unlike other static input-output models, which just measure the purchasing relationships between industry and household sectors, SAM also measures the economic relationships between government, industry, and household sectors, allowing IMPLAN to model transfer payments such as unemployment insurance. Thus, for the specified region, the input-output table accounts for all the dollar flows between the different sectors within the economy.

For this study, Strategic Economics Group used the most recent IMPLAN datasets for North Dakota, South Dakota, Iowa, Illinois and the United States.

[56] IMPLAN Pro User's Guide, 2000

Appendix 8 - About the Strategic Economics Group Research Team

Strategic Economics Group (SEG) is the region's only locally-owned economic research consulting firm. It has served businesses and government clients in Iowa and the Midwest since 2001. The SEG team develops economic impact studies, fiscal impact estimates, cost-benefit models, management information systems and forensic projections.

Harvey Siegelman is the President of Strategic Economics Group. In 2001, Mr. Siegelman retired as Iowa's longest-serving State Economist (1982-2001). He was also Adjunct Professor of Economics at Drake University. Siegelman earned his Master of Arts in Economics degree from Wichita State University. Prior to his appointment as State Economist, he was a professor of economics at University of Wisconsin-Whitewater Campus, University of Findlay (Ohio) and visiting professor at Wichita State University.

Michael Lipsman is a Senior Economic Analyst with Strategic Economics Group. Lipsman has earned a Masters in Community and Regional Planning and a Doctorate in Economics from Iowa State University. Over the course of a 31 year professional career in Iowa State government he has worked as a transportation planner, senior legislative analyst, and tax research analyst. From 2000 to 2011 he managed the Tax Research and Program Analysis Section of the Iowa Department of Revenue.

Daniel Otto is a Senior Economic Analyst with Strategic Economics Group. Otto is Emeritus Professor of Economics at Iowa State University. He received his doctorate in economics from Virginia Polytechnic Institute in 1981 and joined Iowa State University that same year as an Associate Professor and Extension Economist. His research areas include Community and Regional Economic Modeling and Policy Analysis, Economic and Fiscal Impact Analysis and Project Evaluation.

Additional details and contact information can be found on their website: www.economicsgroup.com.

AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

CONTENTS

Appendices

A Tile Repair Drawings

Acronyms and Abbreviations

DAPL Dakota Access Pipeline, LLC (Project Sponsor)

EI/AI Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 Agricultural Mitigation Measures

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. Clearing Brush and Trees along the Easement

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. Topsoil Separation and Replacement

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

(1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

(2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake -** Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage -** If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company's environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. CONSTRUCTION IN WET CONDITIONS

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 COMPENSATION FOR DAMAGES

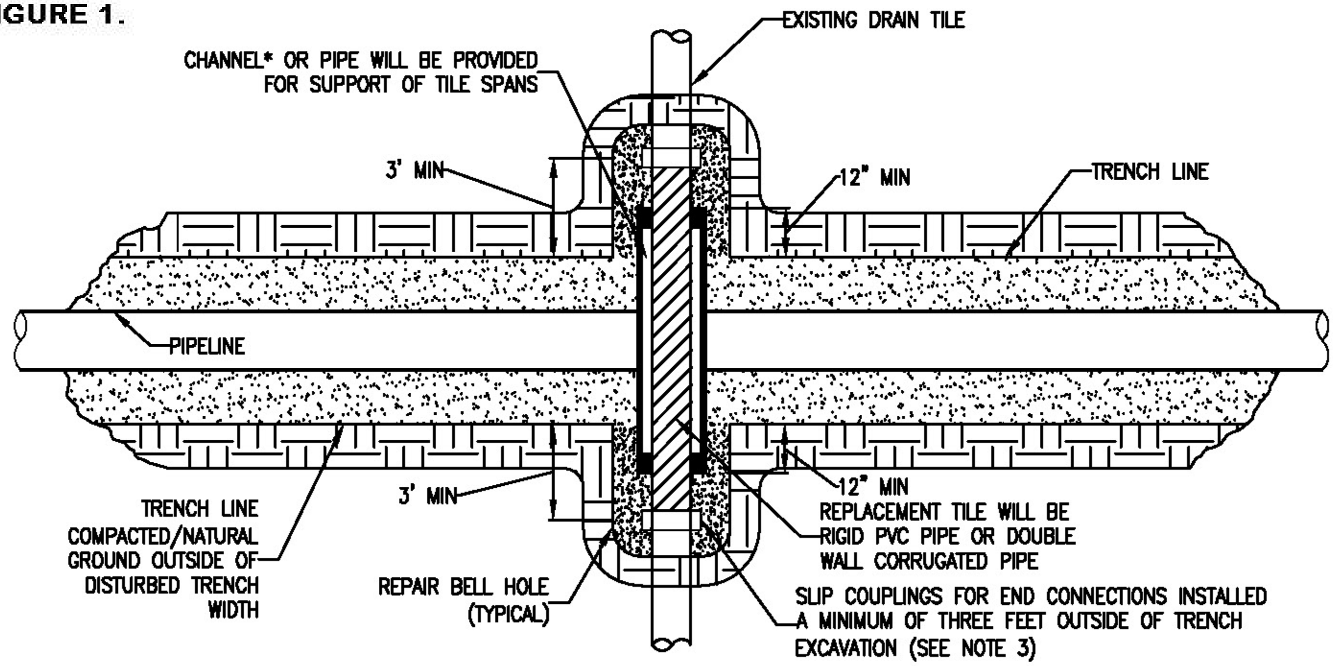
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

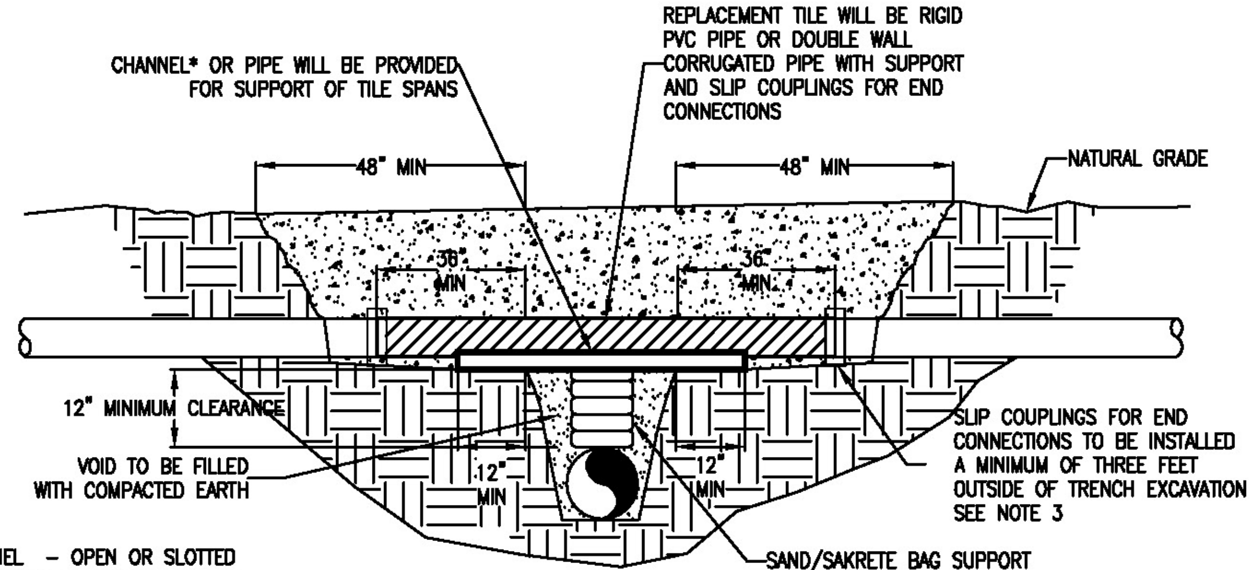
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

CROSS SECTION
N.T.S.

NOTE:

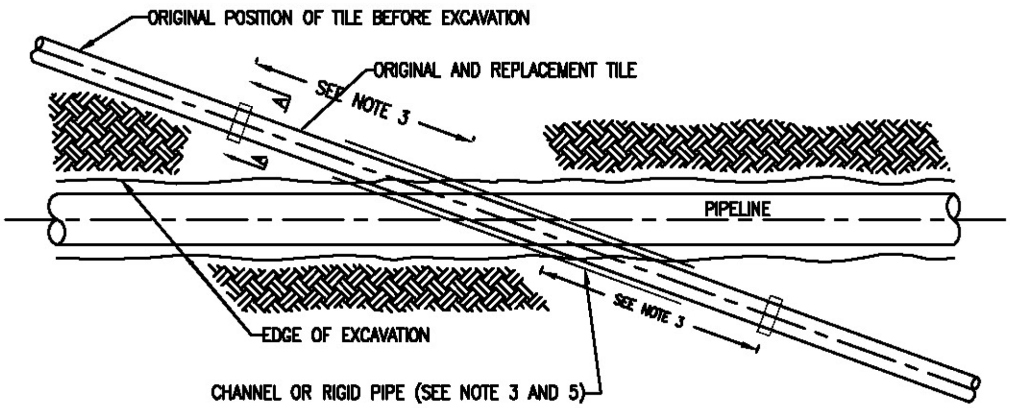
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.

2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.

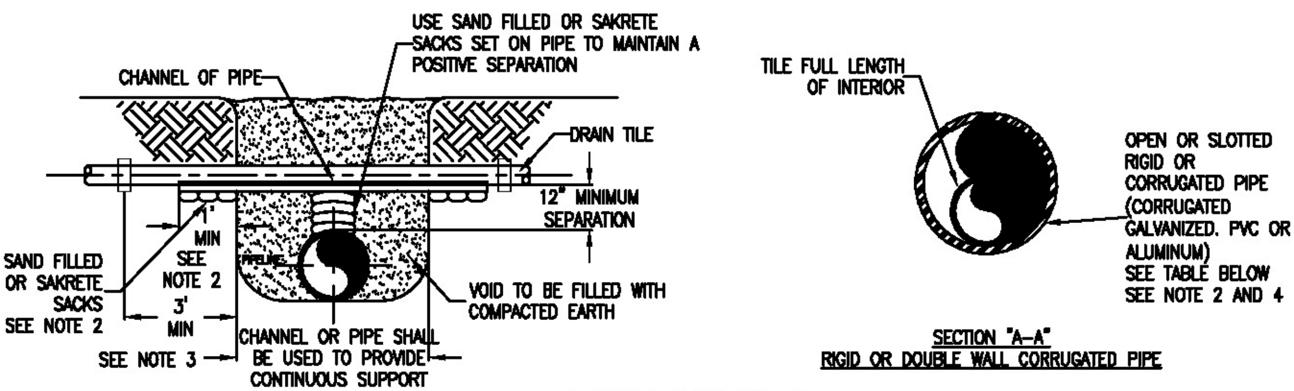
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW



END VIEWS

MINIMUM SUPPORT TABLE					
TILE SIZE	CHANNEL SIZE		PIPE SIZE		
3"	4" @ 5.4	#/ft	4"	STD. WT.	
4"-5"	5" @ 6.7	#/ft	6"	STD. WT.	
8"-9"	7" @ 9.8	#/ft	9"-10"	STD. WT.	
10"	10" @ 15.3	#/ft	12"	STD. WT.	

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.

2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED. PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).

3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.

4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.

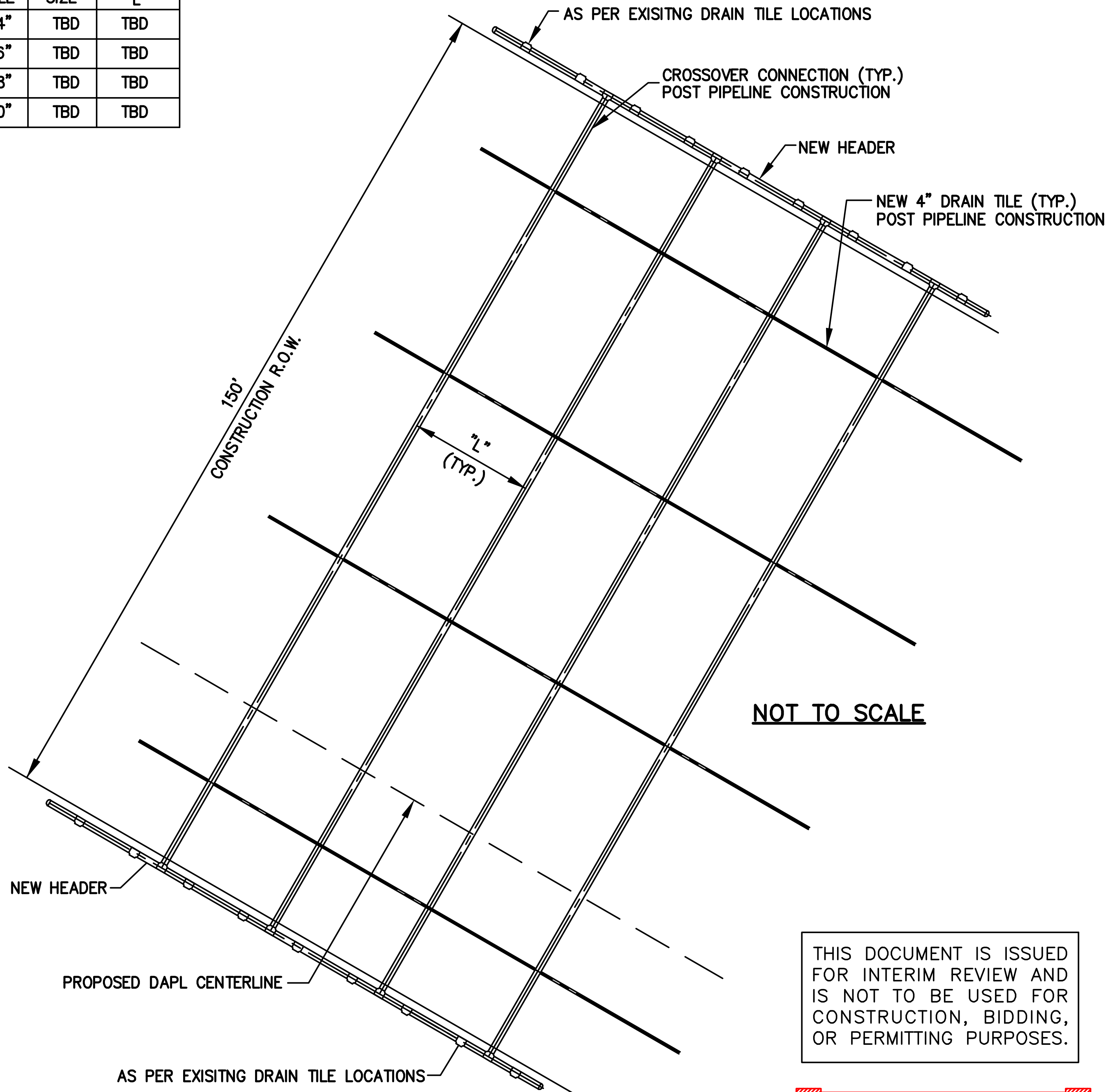
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.

6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.

7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



NOT TO SCALE

THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:

1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO.	REV.
CHECKED BY: DAH	DATE: 09/02/14	P12-49	A
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared By: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-2

As mentioned by commenters and intervenors in this case, the 10-K filed by Energy Transfer Partners, L.P. for the 2013 fiscal year states, "we cannot assure you that our current reserves are adequate to cover all future liabilities." Please explain why this should not be a concern to the public.

Response:

The language referred to in the South Dakota PUC question, is taken from one of the risk factors in the 2013 Energy Transfer Partners, L.P.10-K ("10-K"). That particular risk factor states that, given the nature of our business, there could be a potential impact to the company in the future from laws and regulations, particularly those related to environmental remediation. Similar to the other risks related to our business that are discussed in that section of the 10-K, this risk factor addresses the potential negative impacts that could occur in the future, regardless of whether those impacts are probable or remote or whether any associated potential liabilities can be reasonably estimated. It is simply stating that future events could occur, or information could come to light in the future, that could change what we need to reserve for those liabilities. It does not mean that we would not expect to have adequate liquidity to handle such obligations. This language in the 10-K is designed to warn and inform the various investors to make an informed decision when investing and to notify the investing public of the risks of investing into Energy Transfer and that with any investment into a publicly traded company, there is no way to guarantee the potential unknown or future liabilities and therefore there may or may not be adequate funds to cover those unknown or future liabilities, Please be assured that Energy Transfer Partners follows all applicable accounting and disclosure requirements for loss contingencies.

Prepared By: Jim Wright
Title: Deputy General Counsel
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2010

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-3

Does the surge tank that will be located at the pump station require an aboveground storage tank permit from the DENR?

Response:

No.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-4

Please provide the Company's analysis of the project's risk analysis to drinking water in Lincoln County, given the high water table.

Response:

Normal operation of the pipeline carries no risk to drinking water for humans or livestock. Analyses of risks due to leaks are currently being evaluated through spill modeling; appropriate mitigation measures will be implemented into the design and Facility Response Plan (FRP). The FRP will be filed prior to operation as required by state and federal law. The pipeline is being designed and will be operated to meet or exceed federal and industrial standards regardless of the depth to groundwater.

Please note that wellhead protection areas and source water zones were identified in consultation with the South Dakota Department of Environment and Natural Resources (SDDENR) and avoided during routing to further limit potential impacts to drinking water. None of these areas or zones were identified in Lincoln County.

Further, preconstruction activities include locating wells through data base searches, landowner contacts and physical surveys. The location of all wells within the survey corridor will be collected by global positioning system and excluded from the Project workspace.

Lastly, we are in discussions with water distribution companies to review processes for construction techniques where water distribution lines are encountered along the route. We expect those to include lower waterlines and install casing within the pipeline easement, maintaining a separation below pipeline, as required, at crossing locations.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-5

Outside of the single pumping station, does the applicant intend to construct any other buildings along the route? If so, where and for what purpose?

Response:

At each mainline valve where remote controlled communication equipment is proposed, a small data communications shed or building will be installed. These buildings are not intended to house staff or people, but rather to protect the sensitive equipment from the environmental elements. No utilities other than electricity are proposed with the shed or small building.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-6

Please provide a general description of any pipeline markers and cathodic protection facilities, including their proposed locations.

Response:

According to Part 195.410 buried pipeline markers "must be located at each public road crossing, at each railroad crossing, and in sufficient number along the remainder of each buried line so that its location is accurately known". Test Leads will be installed with some of those pipeline markers. Cathodic protections facilities will be located as required along the pipeline, typical at road crossing and pipeline facilities.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-7

Many commenters have expressed concern for a lack of decommissioning bonding or plan. Please explain why this should not be a concern to the public.

Response:

Energy Transfer and their partners are investing more than $3.8 Billion to serve the producers who have signed contracts and who will rely upon this pipeline to transport their product from the Bakken region. This is not a short term investment and there are no foreseeable plans for decommissioning. With proper design and operation, the longevity of a pipeline project can well exceed a century. Essentially all production in the Bakken would have to cease before this pipeline would be obsolete as pipelines are the cheapest and safest way to transport product from the Bakken. Should production in the Bakken region decline or the market tighten, this economical solution of pipeline transportation becomes even more important to producers to monetize their investment. With the value of this asset, and its value to the US economy, it is unreasonable to predict that it will not be utilized for the foreseeable future. When appropriate, decommissioning would take place according to prevailing rules and regulations making a decommissioning plan developed today obsolete.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-8

If landowners are unaware of existing easements that DAPL easements violate, is the landowner liable for violation of the original easement?

Response:

In no event would a landowner be liable for any of DAPL's actions or if DAPL violated an easement term or a third party easement on private property. DAPL specifically indemnifies that landowner from any and all liability as it relates to actions caused by DAPL. If a landowner violated DAPL's rights under its easements or a third party land right, knowingly or not, they would be liable for any damages to DAPL or the third party for their negligence, just like anyone else in any other land situation where one person has a prescriptive or express right in land via ownership, easement, grant or any other form or legal land rights pursuant to state law.

Prepared By: Joey Mahmoud
Title: Vice President - Engineering
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2710

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-9

Per comments provided by Nancy Stofferahn in the docket, please provide any correspondence with Nortec Seeds regarding routing conflicts as a result of their plans to expand facilities. Does the company believe the proposed route threatens the economic integrity of Nortec Seeds? If so, what has been done or could be done to mitigate any such negative economic impact?

Response:

Dakota Access representatives have called or met with the owners of Nortec Seeds eleven times over a period of several months (November 10, 2014 – March 5, 2015) in an effort to obtain survey permission to determine the impact, if any, of the pipeline route with respect to Nortec's property or potential planned expansions; however, survey permission has been expressly and repeatedly denied. Dakota Access is not in possession of information regarding Nortec Seeds' current economic integrity nor any plans or details relative to a business expansion. The route is currently greater than 700 feet north of the Nortec Seed shed referenced in the letter and the route extends in a north northwesterly direction thus providing additional distance between the remainder of the route and the existing structures on this property. With respect to any planned expansions, the permanent easement would only prohibit permanent structures from being constructed within the fifty foot wide permanent easement, thus providing approximately 650 feet of possible expansion for structures after installation of the pipeline (550 prior to pipeline construction).

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-10

Per comments provided by Matthew Anderson in the docket, please address his concern that the AIMP "leaves many exceptions for Dakota Access not to repair drainage tile back to its original condition."

Response:

A discussion of the temporary and permanent repair of drain tiles is addressed in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan and provided again below. A revised copy of the Plan is attached to this filing.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

   (1) All damaged, broken, or cracked tile will be removed.

   (2) Only unobstructed tile will be used for replacement.

   (3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

   (4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

   (5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

   (6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

consult with the landowner concerning the landowner's plans for these future actions.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-11

Per comments provided by John Peterson in the docket, please address his concern that red bellied dace, sticklebacks, and river otters may be affected by the project.

Response:

Based on review of aerial photography and topographic mapping, there are two waterbodies present on the subject property; an unnamed tributary of the Big Sioux River and a secondary tributary. The Dakota Access route maintains a distance of approximately 500 feet to the unnamed tributary and only crosses the secondary tributary.

Dakota Access conducted environmental surveys within a 400-foot corridor centered on the pipeline across the subject property in April 2015. Based on the field data the secondary tributary that is crossed has no defined channel or ordinary high water mark at the crossing location and was recorded as an emergent wetland; however was documented as channelized and defined elsewhere within the survey corridor and was dry at the time of survey. The proposed crossing location is not suitable habitat for the fish species referenced in the letter. While it is possible for river otters from the Big Sioux River to utilize this area for intermittent foraging, this species is highly mobile, would avoid the area during construction, and adverse impacts cannot be reasonably assumed.

As provided in their initial application, Dakota Access will comply with the U.S. Army Corps of Engineers Nationwide Permit 12 conditions for crossing the wetland on this subject property. Dakota Access will implement best management practices to mitigate for potential construction related impacts associated with stormwater runoff and sedimentation off the right-of-way or into to the tributaries. Additionally, Dakota Access will implement the Spill Prevention Control and Countermeasure Plan to protect sensitive resources from inadvertent releases during construction activities.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-12

In case of erosion, should the pipeline become shallow at any point, will the company be responsible for the costs of adding to the ground cover?

Response:

Yes, DAPL is responsible for the costs of any maintenance to ensure adequate ground cover over it pipeline. If the loss of soil is intentional caused by the action of a third party, DAPL may have the right to seek relief in court to seek fair compensation or remediation of the direct action that caused the soil loss. However for any natural erosion, DAPL would be responsible to provide replacement cover or to lower the line pursuant to Federal standards for cover pursuant to 49 CFR Part 195.

Prepared By: Monica Howard
Title: Director – Environmental Science
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
March 19, 2015 Interrogatory Request No. 1
Request Numbers: 1-1thru1-13

Interrogatory 1-13

Describe Applicant's plan to restore drainage tile to working condition following construction.

Response:

As answered in response to Interrogatory 1-10 herein, Dakota Access has outlined their proposed procedures for temporary and permanent repair of drain tiles in Sections 6f. and 6k. the Agriculture Impact Mitigation Plan. A revised copy of the Plan is attached to this filing.

Prepared By: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

AGRICULTURAL IMPACT MITIGATION PLAN

Dakota Access Pipeline Project (DAPL)

Final Draft

State of South Dakota

Energy Transfer

September 2014

Revised April 2015 in response to PUC Data Request

CONTENTS

Appendices

Acronyms and Abbreviations

DAPL	Dakota Access Pipeline, LLC (Project Sponsor)
EI/AI	Environmental Inspector/Agricultural Inspector

1 INTRODUCTION

Dakota Access Pipeline, LLC (DAPL) is planning a new 30-inch pipeline to transport crude oil from the Bakken Shale region of North Dakota to Illinois. The eastern terminus of the pipeline will connect with an existing pipeline that will transport the crude oil to the Gulf Coast for processing.

The South Dakota section of the pipeline comprises a 277-mile corridor that will run from north central South Dakota to southeast South Dakota. The proposed pipeline will enter South Dakota in Campbell County and diagonally traverse the state, exiting at the crossing of the Big Sioux River in Lincoln County, South Dakota.

The purpose of this document is to present the proposed measures for minimizing impacts to and restoring agricultural lands during and after pipeline construction.

2 PLAN LIMITATIONS

Mitigation measures identified in this plan apply only to agricultural land and do not apply to urban land, road and railroad right-of-way, interstate natural gas pipelines, mined and disturbed land not used for agriculture. The identified mitigation measures will be implemented as long as they do not conflict with federal, state, and local permits, approvals and regulations.

3 SEQUENCE OF CONSTRUCTION EVENTS AND SCHEDULE

Pipeline construction is anticipated to commence January of 2016 following the receipt of required permits and approvals. Pipeline construction will take approximately 9 months to complete.

The sequence of events for pipeline construction will begin with advance notification of landowners and governmental agencies. Following notification, activities will be undertaken in the following sequence:

- Complete final surveys, stake centerline and workspace;
- Access road installation;
- Grubbing and clearing of the construction corridor;
- Installation of stormwater and erosion control measures;
- Placement of pipe and other supplies along the construction corridor;
- Pipeline welding and bending where necessary
- Excavation of the pipeline trench;
- Temporary repairs to tile lines, if encountered;
- Placement of the pipeline with the trench;
- Permanent repairs to tile lines damaged during construction activities;
- Backfill of the trench and rough grading,
- Hydrostatic testing of the pipeline;
- Final grading and restoration;

- Revegetation and post restoration monitoring; and
- Removal of erosion control measures.

4 POINTS OF CONTACT

Each landowner will be provided the name, telephone number, email address, and mailing address of the DAPL landowner representative two weeks prior to construction. This DAPL representative will be the primary contact person for the landowner throughout construction for easement issues. Landowner representatives will be assigned to that geographic area and be responsible for the liaison activities on behalf of DAPL.

In addition to the landowner representative, a team of experienced Environmental and/or Agricultural Inspectors (EIs/AIs), will be involved in project construction, the initial restoration, and the post-construction monitoring and follow-up restoration. For agriculture construction related issues, the name and telephone number of the EI/AI will also be provided as a secondary contact during construction.

5 DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland or pasture and land in government set-aside programs.
Cropland	Land actively managed for growing row crops, small grains or hay.
Drainage Structures or Underground Improvements	Any permanent structure used for draining agricultural lands, including tile systems and buried terrace outlets.
Easements	The agreement(s) and/or interest in privately owned Agricultural Land held by DAPL by virtue of which it has the right to construct, operate and maintain the pipeline together with such other rights and obligations as may be set forth in such agreement.
Environmental Construction Plan (ECP)	Document to present basic environmental construction techniques will be implemented to protect the environment and to minimize potential effects of pipeline and related facilities construction and maintenance.
Pipeline	Any pipe, pipes, or pipelines used for the transportation or transmission of any solid, liquid, or gaseous substance, except water, in

	intrastate or interstate commerce.
Landowner	Person listed on the tax assessment rolls as responsible for the payment of real estate taxes imposed on the property.
Non-Agricultural Land	Any land that is not “Agricultural Land” as defined above.
Pipeline Construction	A substantial disturbance to agricultural land associated with installation, replacement, removal, operation or maintenance of a pipeline.
Soil Conservation Practices	Any land conservation practice recognized by federal or state soil conservation agencies including, but not limited to, grasslands and grassed waterways, hay land planting, pasture, and tree plantings.
Soil Conservation Structures	Any permanent structure recognized by federal or state soil conservation agencies including but not limited to toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.
Right-of-Way (ROW)	Includes the permanent and temporary easements that DAPL acquires for the purpose of constructing and operating the Pipeline.
Tenant	Any person lawfully residing on or in possession of the land, which makes up the "Right-of-Way" (ROW) as defined in this Plan.
Tile	Any artificial subsurface drainage system including clay and concrete, tile, vitrified sewer tile, corrugated plastic tubing and stone drains.
Till	Till is to loosen the soil in preparation for planting or seeding by plowing, chiseling, disking, or similar means. Agricultural land planted using no-till planting practices is also considered tilled.
Topsoil	The upper part of the soil which is the most favorable material for plant growth and which can ordinarily be distinguished from subsoil by its higher organic content and darker color.
Surface Drains	Any surface drainage system such as shallow surface field drains, grassed waterways, open

	ditches, or any other constructed facilities for the conveyance of surface water.

6 AGRICULTURAL MITIGATION MEASURES

The following describes how DAPL proposes to minimize and repair impacts to agricultural lands.

a. CLEARING BRUSH AND TREES ALONG THE EASEMENT

DAPL will be responsible for negotiating compensation related to cutting of any brush and timber for construction of the pipeline with the landowner. Options for removal include: the landowner harvesting any marketable timber/vegetation, the contractor cutting and windrowing along the ROW for Landowner's use, chipped, burned, or hauled off for proper disposal. Unless otherwise restricted by federal, state or local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but are not limited to, burning, chipping, or removal from the property and be approved by the DAPL representative and coordinated with the landowner prior to implementation.

Unless otherwise restricted by federal, state of local regulations and to the extent that the requests are deemed reasonable, DAPL will follow Landowner's easement agreement regarding the removal of tree stumps and disposal of trees, brush, and stumps of no value to the landowner. Methods of disposal can include, but not limited to burning, chipping or completed removal from the property and be approved by the DAPL Chief Inspector & Lead Environmental Inspector prior to implementation.

b. TOPSOIL SEPARATION AND REPLACEMENT

Topsoil and subsoil excavated for pipeline installation will be separated and segregated in separate stockpiles, and returned to the excavation in reverse order to restore the site to pre-construction condition. The depth of the topsoil to be stripped will be a maximum depth of 12 inches or actual depth of top soil if less than 12 inches or as agreed upon with the landowner. Upon request from the landowner, DAPL will measure topsoil depth at selected locations before and after construction.

The stored topsoil and subsoil will have sufficient separation to prevent mixing during the storage period. Topsoil will not be used to construct field entrances or drives, will not be stored or stockpiled at locations that will be used as a traveled way by construction, or be removed from the property, without the written consent of the landowner. Drainage gaps in the topsoil and subsoil piles will be left to avoid blocking drainage across the right of way.

Topsoil will not be removed where the pipeline is installed by plowing, jacking, boring, or other methods that do not require the opening of a trench.

The topsoil will be replaced so the upper portion of the pipeline excavation and the crowned surface, and the cover layer of the area used for subsoil storage, contains only the topsoil originally removed.

In most areas, ditch-line crowns will be installed to allow for and counter-act ditch settling. In the event the landowner will not allow a ditch-line crown, DAPL may have to regrade the right of way in subsequent growing season. In this situation, DAPL may regrade the construction right of way and till down to 12 inches to manipulate the soil such that the original contours and elevation are restored. The depth of the replaced topsoil will conform as nearly as possible to the depth removed. Where excavations are made for road, stream, drainage ditch, or other crossings, the original depth of topsoil will be replaced as nearly as possible.

c. Prevention of Erosion

DAPL will follow best management practices and industry standards for erosion and sedimentation control during construction and post-construction. DAPL will develop a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will detail the project specific stormwater and soil erosion prevention measures. In addition to the SWPPP stipulations, all of the regulations and conditions associated with the required South Dakota DNR NPDES permit will require the Contractor's full compliance. An approved SWPPP and South Dakota DNR NPDES permit will be required before any earth disturbing construction activities can take place.

d. Aboveground Facilities

The location for any aboveground structures will be selected in coordination with respective landowners. If use of agricultural land use is appropriate and/or necessary, aboveground structures will be located in a manner to minimize interference with agricultural operations. Compensation for aboveground structures will be negotiated as part of landowner compensation.

e. Pumping Water from Open Trenches

Trench and/or pit dewatering is necessary due to accumulation of precipitation and/or groundwater in open trenches; the Contractor will locate discharges within the Project ROW whenever feasible to avoid potential impacts to adjacent areas. Should a discharge need to occur outside of the ROW, prior landowner approval will be obtained and the area will be restored to pre-construction conditions. Pumping will occur in a manner that will avoid damaging adjacent agricultural land, crops, and/or pasture. Erosion and sedimentation control measures will be implemented and may include the use of dewatering structures, splash plates, sediment bags, haybales, and silt fence. The removal and disposal of trench water will comply with applicable drainage laws and local ordinances relating to such activities as well as provisions of the federal Clean Water Act.

Prior to initiating dewatering activities, the EI must check the water discharge situation to ensure that the best management practices are applied in such a way to avoid erosion and sedimentation offsite.

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event.

a. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:

   (1) Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to soak into the ground as compared to clay soils.

   (2) Ground Surface - The topography in the area that would influence the surface flow of the discharged water.

(3) Adjustable Discharge Rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may soak into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area)

(4) Discharge Outfall - The amount of hose and number/size of pumps needed to attempt to discharge water at a location, which drains away from waterbodies or wetlands.

b. **Pump Intake -** Use floating suction hose or other similar measures to prevent sediment from being sucked from bottom of trench.

c. **Overwhelming Existing Drainage -** If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream.

d. **Filtering Mechanism**

(1) All dewatering discharges will be directed through a filtering device as indicated below.

i) Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a geotextile filter bag. Geotextile bags need to be sized appropriately for the discharge flow and suspended sediment particle size.

ii) Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate. A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.

iii) Alternative dewatering methods (e.g., use of water cannons) may be approved by DAPL on a site-specific basis.

f. Temporary and Permanent Repair of Drain Tiles

The following methods for repair of drain tiles are proposed:

a. **Movement of Drain Tiles before Construction**: DAPL will install, or compensate the landowner to install, with landowner consent, parallel tile drains along the proposed right-of-way in advance of pipeline construction to maintain the drainage of the field tile drain system. After construction, the parallel tile drains will be connected across the pipeline right-of-way to facilitate a re-united overall tile drain system in the agricultural field.

b. **Pipeline Clearance from Drain Tile:** Where underground drain tile is encountered within in the project profile, the pipeline will be installed in such a manner that the permanent tile repair can be installed with at least 24 inches of clearance from the pipeline or as agreed upon with landowner.

c. **Temporary Repair:** The following standards will be used to determine if temporary repair of agricultural drainage tile lines encountered during pipeline construction is required.

(1) Any underground drain tile damaged, cut, or removed and found to be flowing or which subsequently begins to flow will be temporarily repaired as soon as practicable, and the repair will be maintained as necessary to allow for its proper function during construction of the pipeline. The temporary repairs will be maintained in good condition until permanent repairs are made.

(2) If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within ten days of the time the damage occurred.

(3) Temporary repair is not required if the angle between the trench and the tile lines places the tile end points too far apart for temporary repair to be practical.

(4) If temporary repair of the line is not made, the upstream exposed tile line will not be obstructed but will nonetheless be screened or otherwise protected to prevent the entry of foreign materials and small animals into the tile line system, and the downstream tile line entrance will be capped or filtered to prevent entry of mud or foreign material into the line if the water level rises in the trench.

d. **Marking:** Any underground drain tile damaged, cut, or removed will be marked by placing a highly visible flag in the trench spoil bank directly over or opposite such tile. This marker will not be removed until the tile has been permanently repaired.

e. **Permanent Repairs:** Tile disturbed or damaged by pipeline construction will be repaired to its original or better condition. Permanent repairs will be completed as soon as is practical after the pipeline is installed in the trench and prior to backfilling of the trench over the tile line. Permanent repair and replacement of damaged drain tile will be performed in accordance with the following requirements:

(1) All damaged, broken, or cracked tile will be removed.

(2) Only unobstructed tile will be used for replacement.

(3) The tile furnished for replacement purposes will be of a quality, size and flow capacity at least equal to that of the tile being replaced.

(4) Tile will be replaced so that its original gradient and alignment are restored, except where relocation or rerouting is required for angled crossings. Tile lines at a sharp angle to the trench will be repaired in the manner shown in Appendix A.

(5) The replaced tile will be firmly supported to prevent loss of gradient or alignment due to soil settlement. The method used will be comparable to that shown in Appendix A.

(6) Before completing permanent tile repairs, all tile lines will be examined visually, by probing, or by other appropriate means on both sides of the trench within any work area to check for tile that might have been damaged by construction equipment. If tile lines are found to be damaged, they must be repaired to operate as well after construction as before construction began.

f. **Inspection:** Prior to backfilling of the applicable trench area, each permanent tile repair will be inspected for compliance by the DAPL Tile Inspector.

g. **Backfilling:** The backfill surrounding the permanently repaired drain tile will be completed at the time of the repair and in a manner that ensures that any further backfilling will not damage or misalign the repaired section of the tile line.

h. **Subsurface Drainage:** Subsequent to pipeline construction and permanent repair, if it becomes apparent the tile line in the area disturbed by construction is not functioning correctly or that the land adjacent to the pipeline is not draining properly, which can reasonably be attributed to the pipeline construction, DAPL will make further repairs or install additional tile as necessary to restore subsurface drainage.

g. Removal of Rocks and Debris from the Right-of-Way

Excess rocks will be removed from the right-of-way. On completion, the topsoil in the easement area will be free of all rocks larger than three inches in average diameter that are not native to the topsoil prior to excavation, and similar to adjacent soil not disturbed by construction. The top 24 inches of the trench backfill will not contain rocks in any greater concentration or size than exist in the adjacent natural soils. Consolidated rock removed by blasting or mechanical means shall not be placed in the backfill above the natural bedrock profile or above the frost line. In addition, DAPL will examine areas adjacent to the easement and along access roads and will remove any large rocks or debris that may have rolled or blown from the right-of-way or fallen from vehicles.

Rock that cannot remain in or be used as backfill will be disposed of at locations and in a manner mutually satisfactory to the company’s environmental inspector and the landowner. All debris attributable to the pipeline construction and related activities will be removed and disposed of properly; such debris includes spilled oil, grease, fuel, or other petroleum or chemical products. Such products and any contaminated soil will be removed for proper disposal or treated by appropriate in situ remediation.

h. Restoration after Soil Compaction and Rutting

Agricultural land compacted by heavy project equipment, including off right-of-way access roads, will be deep tilled to alleviate soil compaction upon completion of construction on the property. In areas where topsoil was removed, tillage will precede replacement of topsoil. At least three passes with the deep tillage equipment shall be made. Tillage shall be at least 18 inches deep in land used for crop production and 12 inches deep on other lands,(except where shallow tile systems are encountered), and shall be performed under soil moisture conditions which permits effective working of the soil. If agreed in advance, this tillage may be performed by the landowners or tenants using their own equipment.

Rutted land will be graded and tilled until restored as near as practical to its preconstruction condition. On lands where topsoil was removed, rutting will be remedied before topsoil is replaced.

i. Restoration of Terraces, Waterways and other Erosion Control Structures

Existing soil conservation practices and structures damaged by pipeline construction, such as surface drains, embankments and terraces, grass waterways will be restored to pre-construction elevation, grade and condition. Any drain lines or flow diversion devices impacted by pipeline construction will be repaired or modified as needed. Soil used to repair embankments intended to retain water shall be well compacted. Disturbed vegetation will be reestablished, including a cover crop when appropriate. Restoration of terraces will be in accordance with Standard Drawings in Appendix A.

j. Revegetation of Untilled Land

Agricultural land not in row crop or small grain production at the time of construction, such as hay fields and land in conservation or set-aside programs, will be reseeded following completion of deep tillage and replacement of the topsoil. The seed mix used will restore the original or a comparable ground cover unless otherwise requested by the landowner.

Land that is normally used for crops that will not be planted due to pipeline construction will be seeded with an appropriate cover crop following replacement of the topsoil and completion of deep tillage, unless otherwise agreed to with the landowner. Cover crop seeding may be delayed if construction is completed too late in the year for a cover crop to establish and in such instances is not required if the landowner or tenant proposed to till the land the following year.

k. Future Drain Tiles and Soil Conservation Structure Installation

At locations where future drain tile or soil conservation practices and structures are made known to DAPL in writing prior to securing the easement on the property, the pipeline will be installed at a depth that will permit proper clearance between the pipeline and the proposed tile installation, or allow for proper installation of the conservation practices. DAPL will consult with the landowner concerning the landowner's plans for these future actions.

l. Restoration of Land Slope and Contour

The slope, contour, grade, and drainage pattern of the disturbed area will be restored as nearly as possible to its preconstruction condition. However, the trench may be crowned to allow for anticipated settlement of the backfill. DAPL will remediate areas of excessive or insufficient settlement in the trench area where it visibly affects land contour or alters surface drainage. Disturbed areas where erosion causes excessive rills or channels or areas of heavy sediment deposition, will be regraded as needed. On steep slopes, methods such as sediment barriers, slope breakers, or mulching will be used as necessary to control erosion until vegetation can be reestablished.

m. Siting and Restoration of Areas Used for Field Entrances and Temporary Roads

The location of temporary roads to be used for construction purposes will be negotiated with the landowner and the Tenant. The temporary roads will be designed to not impede proper drainage and will be built to minimize soil erosion on or near the temporary roads.

Post construction and restoration temporary field entrances or access roads will be removed and the land made suitable for its previous use, in agreement with the landowner. Areas affected will be regraded and deep tilled as required. If by agreement or at landowner request, and approved by local public road authorities, a field entrance or road is left in place, it will be left in a graded and serviceable condition.

n. Construction in Wet Conditions

Construction in wet soil conditions will not commence or continue at times when or locations where the passage of heavy construction equipment may cause rutting to the extent that the topsoil and subsoil are mixed, or underground drainage structures may be damaged. To facilitate construction in soft soils, DAPL may elect to remove and stockpile the topsoil from the traveled way, install mats or padding, or use other methods.

7 Compensation for Damages

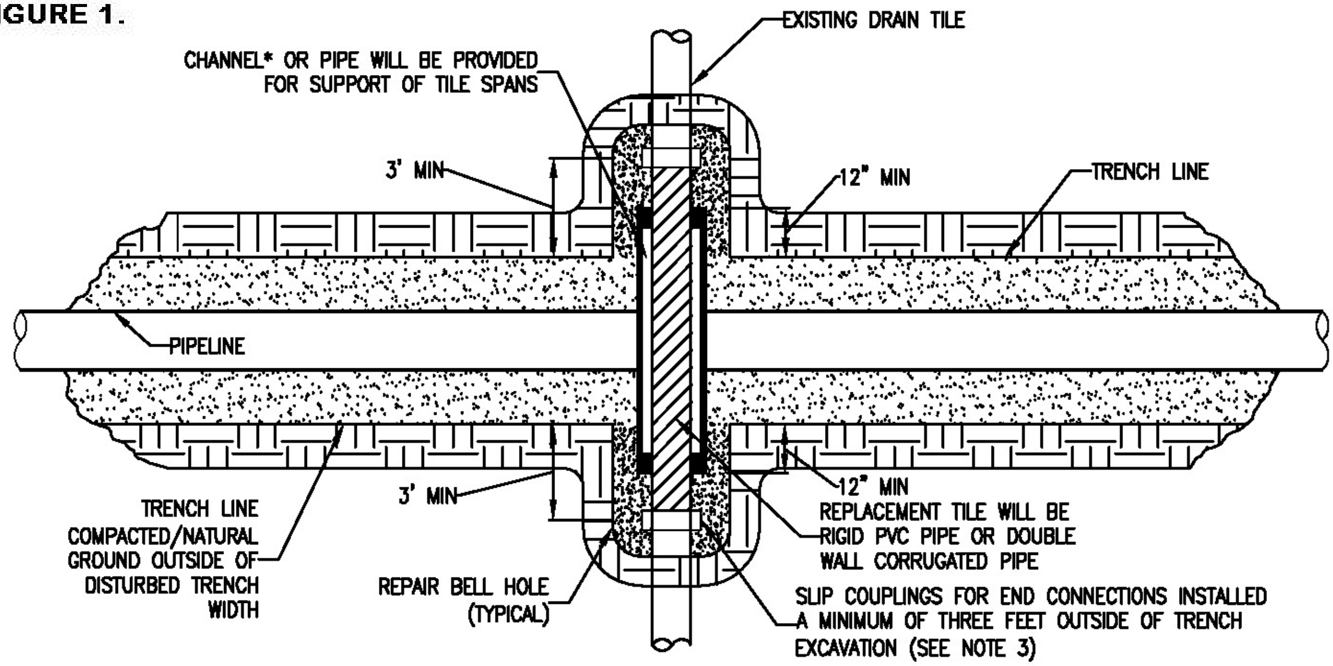
DAPL will be responsible for compensating the landowner for damages during construction. For crops, value of the loss will be established based on current crop values in the area of the impact per South Dakota Department of Agriculture statistics. DAPL will also compensate the landowner for loss of use of agricultural land, if attributable to pipeline construction. Supplemental soil sampling, testing and additional restoration activities to restore agricultural land to its pre-construction conditions will be undertaken by DAPL upon request of the landowner.

DAPL will also be responsible to compensate landowners for other physical property damage attributable to pipeline construction, such as fences, driveways and other structures.

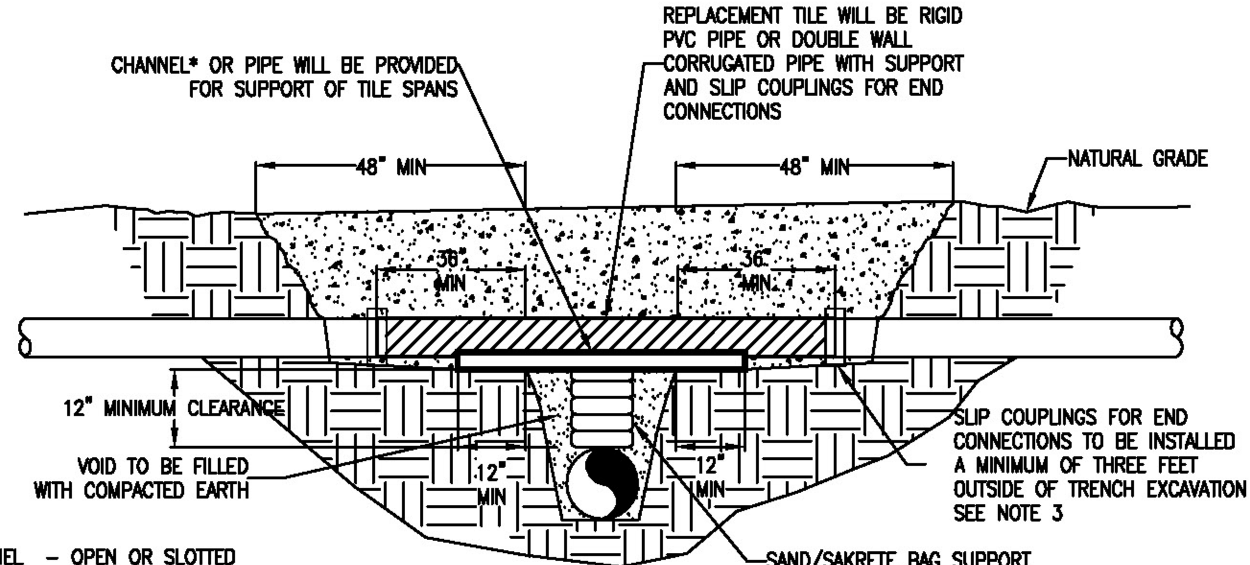
Appendix A

Tile Repair Drawings

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

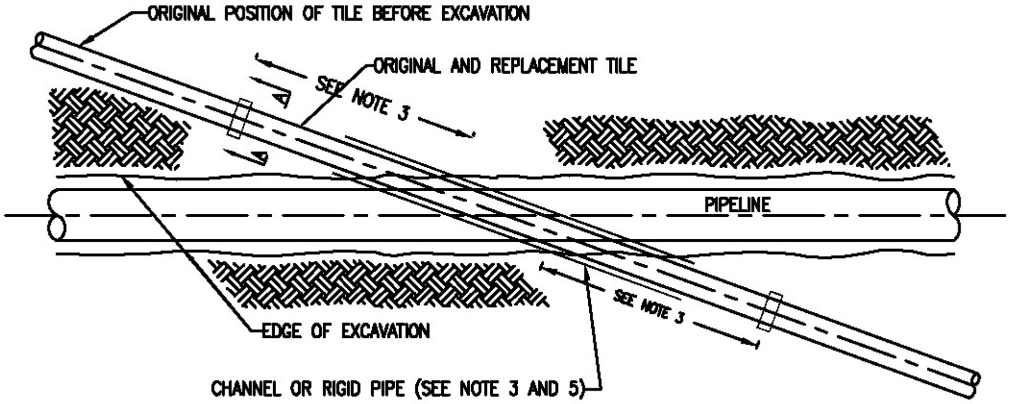
CROSS SECTION
N.T.S.

NOTE:

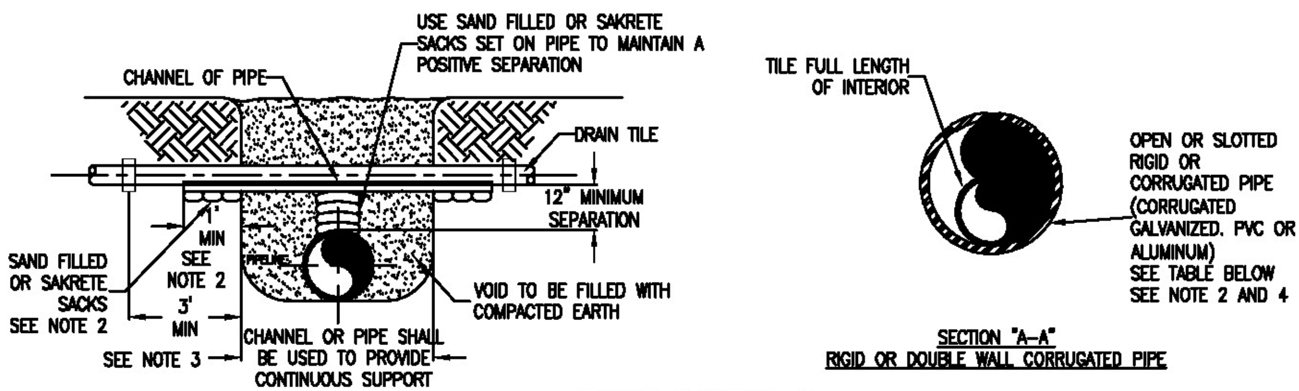
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW



END VIEWS

MINIMUM SUPPORT TABLE					
TILE SIZE	CHANNEL SIZE		PIPE SIZE		
3"	4" @ 5.4	#/ft	4"	STD. WT.	
4"-5"	5" @ 6.7	#/ft	6"	STD. WT.	
8"-9"	7" @ 9.8	#/ft	9"-10"	STD. WT.	
10"	10" @ 15.3	#/ft	12"	STD. WT.	

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.

2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED. PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAKRETE, OR SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).

3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.

4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.

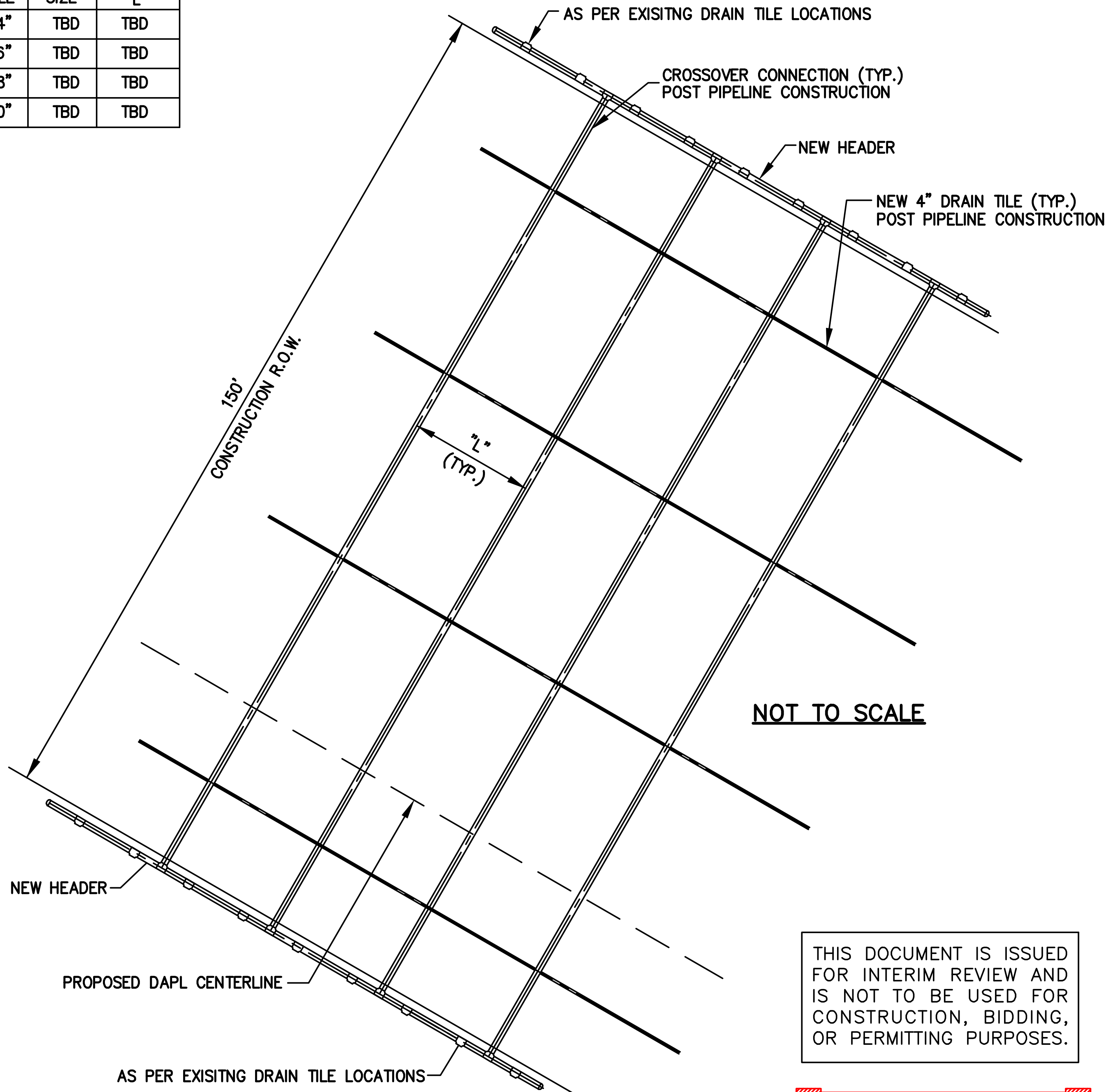
5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.

6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.

7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

DRAIN TILE	HEADER SIZE	SPACING "L"
4"	TBD	TBD
6"	TBD	TBD
8"	TBD	TBD
10"	TBD	TBD



THIS DOCUMENT IS ISSUED FOR INTERIM REVIEW AND IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ISSUED FOR REVIEW
09/02/14

NOTES:
1. HEADERS WILL BE CONNECTED TO EXISTING DRAIN TILE PRE-CONSTRUCTION.
2. CROSSOVER PIPING WILL BE INSTALLED POST PIPELINE INSTALLATION.

REV.	DATE	BY	DESCRIPTION	CHK.
A	9/2/14	DAH	ISSUED FOR REVIEW	

PROJECT NO. 10395700

DAPL/ETCOP

TYPICAL DRAIN TILE HEADER SYSTEM

DRAWN BY: DAH	DATE: 09/02/14	DWG. NO.	REV.
CHECKED BY: DAH	DATE: 09/02/14	P12-49	A
SCALE: N.T.S.	APP.:		

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-1

State the name, current address, and telephone number of the person or persons answering these interrogatories.

Response:

See the individual responses for the information requested.

Prepared by: Stephen Veatch
Title: Senior Director - Certificates
Address: 1300 Main St. Houston, TX 77002
Telephone Number: 713-989-2024

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-2

Briefly explain the status of any civil actions pending in South Dakota Circuit Court(s) regarding the Dakota Access Pipeline. Does Dakota Access anticipate the Circuit Courts(s) will take action prior to the date of the evidentiary hearing in this proceeding?

Response:

Dakota Access was denied survey access by property owners on various tracts of land along the route. As a result, Dakota Access requested the Circuit Court in relevant counties to enter an Order permitting access to property for the purpose of conducting necessary surveys. Dakota Access anticipates the Circuit Court will take action prior to the evidentiary hearing. Please advise if Staff would like additional information including property owner name, Circuit Court file numbers or any additional level of detail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-3

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 3: Are shipping contracts take or pay contracts? In addition to oil fields production forecasts, refining capacity, and shipping contracts, are there any other assurances DAPL can provide to the public that the pipeline will be utilized over the near-term and mid-term?

Response:

The term used in the Shipper's contract is a "transportation and deficiency" contract. This term is synonymous with a "take or pay" contract, except the former is typically used in relation to the utilization of capacity and the latter typically relates to the receipt of the commodity. In summary, a "transportation and deficiency" contract is one under which the committed shipper agrees to pay the carrier for the availability of transportation service, even during periods when that transportation service is not actually utilized by the committed shipper. In addition to the applicable fees paid by the committed shipper for volumes actually transported in a month, the committed shipper pays a "deficiency payment" to the carrier for the volume of crude petroleum not transported within the committed shipper's committed volume of pipeline capacity. In terms of utilization in the near-term and mid-term, 100% of the committed shippers of Dakota Access have entered a transportation and deficiency contract with a term of 5 years or greater, and 98.6% of the committed shipper volume is under transportation and deficiency contracts with a term of 7 years or greater. Additionally, North Dakota has very limited refining capacity within the state; accordingly, the crude oil production in North Dakota must be transported to reach markets where it can be sold.

Prepared by: Damon Daniels
Title: Vice President – Commercial Operations
Address: 1300 Main Street Houston, Texas 77002
Telephone Number: 713-989-7920

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-4

Referring to DAPL's Response to Staff's March 18, 2015, Data Request No. 33: Specifically address the claims made by land owners that the notice they received contained either an incorrect name or address and how DAPL performed a Quality Assurance/Quality Control check to verify all landowners properly received notice according to SDCL 49-41B-5.2.

Response: The list of landowners entitled to notice, was generated through tax records kept by each local county government office. Notice letters were sent to landowner addresses on file. Two Hundred Eighty Three (283) letters were returned undeliverable based on the name and address on record with the local government office. The returned letters were all cross-checked against the tax record generated list. None of the letters were returned due to a printing error.

In addition to the letters, DAPL published notice per South Dakota code and provided notice to all county auditor offices.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota AccessAddress: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-5

Regarding the pump station in Spink County, please provide any known concerns from neighboring residences. Further, please identify any reasonable measures that DAPL plans to implement in order to mitigate concerns such as noise levels and viewshed deterioration that the pump station may cause.

Response: Neighboring residents have voiced noise level concerns. The pumps will be fully enclosed in buildings designed for noise abatement. Noise levels will be reduced to 55 dBA at the pump station property line. Dakota Access will add landscaping and/or paint highly visible components at the pump station to blend in with the landscape as a measure to minimize visual impacts.

Prepared by: Chris Srubar
Title: Engineer
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-2879

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-6

Please provide references to any specific sections of the Application, any responses to discovery requests, and any other evidence that DAPL intends to use for demonstrating the Applicant meets the burden of proof to establish that "[t]he proposed facility will comply with all applicable laws and rules." [SDCL 49-41B-22(1)]

Response:

From Federal Pipeline Safety regulations to local county ordinances, Dakota Access is subject to all applicable rules and regulations. Every part of the pipeline's construction and operation is regulated by overlapping levels of government regulation. Table 5.0-1 in the Application lists the various government agencies or bodies which regulate or permit the process during the construction process and beyond. Dakota Access will comply with all rules and regulations of all listed agency or government body. In addition, Dakota Access is subject to all South Dakota Codified laws just as any other business in the State of South Dakota.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-7

In section 14.5 of the Application, page 13, it is identified that DAPL has retained an agricultural consultant to develop specific mitigation measures for work in shallow Natric soils. Please provide the name of the agricultural consultant that DAPL references.

Response:

Aaron DeJoia
DURAROOT ENVIRONMENTAL CONSULTING
4626 WCR 65 • Keenesburg, CO 80643

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-8

In section 16.3 of the Application it is identified that final results of field surveys and input from resource agencies were pending at the time the application was submitted. Please provide an update on the field surveys and agency consultation that has occurred since the application was filed. Moreover, please provide a copy of any finalized filed surveys and mitigation/protection measures to be implemented to protect sensitive, threatened, and endangered species.

Response: Field surveys are complete for all tracts with granted survey access. The only federally listed species potentially encountered along the project in South Dakota is the Topeka shiner at select locations. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

The Class III cultural resource survey report was submitted to the South Dakota State Historic Preservation office on June 5, 2015.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-9

In section 17.1.1 of the Application it is stated that: "To minimize impacts to aquatic resources, appropriate remedial measures will be implemented to meet federal and state standards designed to ensure protection of aquatic biota." Please provide a discussion on the federal and state standards the project will need to meet and the Applicant's plan to implement the appropriate remedial measures to meet the standards.

Response: With respect to aquatic resources, the project will comply with all applicable sections of the Clean Water Act and South Dakota Codified Law regarding water quality. Dakota Access has submitted a verification request to the USACE for authorization under the Nationwide 12 permit. Dakota Access will comply with all conditions defined in the Nationwide 12 permit and issued verifications, including conditions required by the SD Department of Environment and Natural Resources 401 water quality certification that has been issued for Nationwide permit 12 to minimize impacts to aquatic resources.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-10

In section 17.4 and 17.4.1 of the Application, on page 30, it is identified that "pending final results of field surveys and input from resource agencies, appropriate mitigation and protection measures will be implemented to minimize potential impacts [to the Topeka shiner]." Please provide the status of final surveys and consultation with resource agencies. Also please provide results of any completed surveys and agency coordination that specifies the mitigation and protection measures deemed to be appropriate to protect the Topeka shiner.

Response: This is addressed in the response to interrogatory 2-8. The USACE and USFWS indicated that the Topeka shiner may be present at select locations along the project route in South Dakota. Dakota Access intends to HDD some of these streams and will comply with the Programmatic Biological Opinion for select Nationwide Permits in South Dakota for the Topeka shiner (October 2014) where the streams would be open cut; this has been communicated with the USACE regarding our submitted Nationwide Permit 12 Preconstruction Notifications that are pending verification.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-11

Please identify each parcel of property to be impacted by the pipeline that is owned by the State of South Dakota.

Response: See Interrogatory No. 2-11 Attachement No. 1

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-12

Please explain how any State of South Dakota owned land falls within the predictive model used to identify cultural resources and historic properties.

Response: The Project crosses one parcel of state owned property. The parcel was identified as having a high and moderate probability for cultural resources. The predictive model was based on environmental factors and known cultural resources to predict the likely locations of unidentified cultural resources.

Surveys have been completed at this tract; one archaeological site was encountered and the alignment was shifted to avoid the site. Survey results were included in the cultural resource reporting which in currently under review with the SD SHPO. No impacts to cultural resources are expected to impacted on this tract.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-13

Has Dakota Access applied for, or received, a permit from the State Archeologist to conduct filed investigations on State of South Dakota owned land? If answered in the affirmative, please provide a copy of the permit from the State Archeologist. If answered in the negative, will Dakota Access be filing for a permit from the State Archeologist in order to conduct field investigations on State of South Dakota owned land?

Response: A State Permit was obtained for this survey and is attached as SD PUC Interrogatory 2-13 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186
:

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-14

Please provide any information or reports on Dakota Access's efforts made to identify cultural and historic sites sensitive to Native American Tribes along the project route.

Response: **Dakota Access has not conducted any Traditional Cultural Properties (TCP) studies for the Project nor have they been requested. The cultural resource survey protocol was developed by Dakota Access in compliance with the applicable South Dakota and federal standards and was reviewed and approved by the SHPO prior to initiating field surveys. Dakota Access' surveys documented some potentially eligible sites for listing in the National Register of Historic Places. These sites have been largely avoided through route modifications and consultation is ongoing with the SHPO. Lead federal agencies (the USACE and USFWS in this case) are responsible for conducting government to government tribal consultations as they deem necessary in regard to their respective federal actions on the Project.**

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-15

In response to interrogatory 59 in DRA's first request for discovery, DAPL identifies that there will be three mainline construction spreads. In the revised application, DAPL identifies there will be two large construction spreads. Please clarify the number of construction spreads, and construction jobs associated with those spreads, that will occur during the construction phase in South Dakota.

Response:

Dakota Access plans to have three pipeline construction Spreads in South Dakota. Spread 5 (~124 Miles) will be entirely in South Dakota. Spread 4 (~ 127 Miles) will be in South Dakota and extend into Iowa to the southeast and Spread 6 will be in South Dakota and extend into North Dakota to the northwest.

Each pipeline construction spread will include approximately 700 to 1,000 persons per spread.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-16

Please provide an update on consultation with the U.S. Fish and Wildlife Service. Has the agency provided Dakota Access with a biological opinion? If so, please provide a copy of the biological opinion and any mitigation measures or recommendations issued by the U.S. Fish and Wildlife Service for the Dakota Access Pipeline. If not, please identify when Dakota Access expects to receive the biological opinion.

Response: Please see responses to 2-8 and 2-10 above.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-17

Describe any measures DAPL will take to ensure that the source water for hydrostatic testing does not exceed water quality standards, such that the discharge of such water could result in a violation of hydrostatic testwater discharge quality limits.

Response: In accordance with required permits, Dakota Access will test source water prior to withdrawal and will take appropriate measures to ensure that discharges comply with applicable permit thresholds.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-18

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 3 it states: "When used from this point forward in this Plan, "EI" will refer to the responsible person, whether it is the EI, CI, Health, Safety and Environmental (HSE) Coordinator, or Project Manager or other responsible person." Please provide a consistent definition of "EI" across the project plans and defined roles and responsibilities between the EI, the contractor, and other members of the construction team.

Response: Dakota Access has revised the Draft Stormwater Pollution Prevention Plan and it addresses this request. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-19

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," please clarify the following apparent discrepancy: On page 3 it is identified that "The Project's EI is responsible for determining the schedule and placement of BMPs." Although DAPL's SWPPP leaves this to the EI's discretion, the South Dakota General Permit states that the plan must comply with Section 3.9 as follows:

3.9 Erosion Control and Stabilization

The permittee shall stabilize disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. All other exceptions shall be approved on an individual basis by the Secretary.

Response: The EI's determination will meet or exceed (less time) than that stated in the South Dakota General Permit. The revised draft Stormwater Pollution Prevention Plan clarifies this. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-20

Referring to Exhibit D1, titled "Draft Stormwater Pollution Prevention Plan," on page 4 it states: "The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented." Please provide a description of front-end grading and topsoil/subsoil storage.

Response: Appropriate descriptions have been incorporated into the attached revised Draft Stormwater Pollution Prevention Plan. See SD PUC Interrogatory No. 2-18 – Attachment No. 1.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

As outlined in Section 14.7– Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity and safety of the pipeline, which may include realignment or specialized construction techniques.

Response:

See SD PUC Interrogatory No. 2-21 – Attachment No. 1

Prepared by: Mark Miller/Craig Erdman
Title: Group Leader-Principal/Senior Engineering Geologists
Address: 3050 S. Delaware Springfield, MO 65804
Telephone Number: 417-831-9700

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Interrogatory Request No. 2
Request Numbers: 2-1 through 2-22

Interrogatory 2-22

Referring to the excerpt from the Application provided below, as found on page 16 of the application, please confirm that the need for water appropriations permits for the use of surface and groundwater has been addressed in the application.

15.3 SURFACE WATER AND GROUNDWATER

Dakota Access may utilize surface waters as a water source for hydrostatic testing. Exact locations of the hydrostatic testing and discharge sites will be determined by the selected contractor, additional information on testing and discharge areas is provided in Hydrology Section 15.5– Discharge Water. Additional information on surface waters within the Project area is included in Sections 17.0– Effect on Aquatic Ecosystems and 20.0– Water Quality.

15.4 AQUIFERS

Dakota Access anticipates utilizing surface water for hydrostatic testing purposes. Groundwater is not currently proposed for use during construction and operation of the Project.

Response: Groundwater appropriations have not been addressed in the application as no use of groundwater is proposed. Dakota Access will obtain the necessary permits required for utilization of surface waters, as identified in Table 5.0-1 of the application.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-1

Please provide copies interrogatories from other parties served upon Applicant and Applicant's answers as they become available.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-2

Please provide copies of responses of other parties to Applicant's interrogatories and requests for production of documents, as well as any related follow-up contacts or demands when they are received.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-3

Please produce any document requested in, or used in DAPL's response to, any of the interrogatories submitted above.

Response:

Due to the volume of materials, a drop box link will be provided via e-mail.

Prepared by: May Adam Law Firm
Title: Lead Counsel for Dakota Access
Address: 503 South Pierre Street Pierre, SD 57501
Telephone Number: 605-224-8803

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-4

In section 23.6 of the application, it is identified that an Unanticipated Discovery Plan will be submitted to SHPO for approval. Please produce the Unanticipated Discovery Plan and any communications received from SHPO approving the plan.

Response: **Dakota Access has submitted the draft unanticipated discovery plan to the SHPO for review; no response has been received to date. See SD PUC Request 2-4 – Attachment No. 1**

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-5

Please provide record of any consultation with SHPO by Dakota Access or any other governmental agency for review and comment on activities regarding jurisdictional cultural resources as identified in Table 5.0-1 of the application.

Response: Copies of email correspondence from Dakota Access to the SHPO is included in SD PUC Request 2-5 – Attachment No. 1. Dakota Access has not been privy to any copies of consultations by other agencies to the SHPO to date.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-6

Referring to DAPL's Response to Staff's March 19, 2015, Interrogatory 1-5: As stated in the revised Application, DAPL identifies all valves will have remote actuators and, thus, a communications shed adjacent to the valves. If any valve locations were changed since filing of the Application please provide the most current design drawings for the pipeline that shows the location of motor operated valves, manually operated valves, check valves, cathodic protection test sites, pig launchers/receivers, and pump station. Please provide this information as a map and GIS shapefile if changes were made since the shapefiles produced in response to Staff's first interrogatories.

Response:

See SD PUC Request 2-6 Attachment No. 1 are maps of requested motor operated valves, pig launcher/receivers, and pump stations. At this time DAPL does not have any check or manual valves. Test leads will be located at road/railroad crossings, along fences, and generally at least one every mile.

Prepared by: Jack Edwards
Title: Project Manager
Address: 11103 Aurora Ave. Urbandale, IA 50322
Telephone Number: 844-708-2639

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-7

In section 16.3 of the Application it is stated that: "Early coordination and informal consultation with the USFWS, the South Dakota Natural Heritage Program (SDNHP), and South Dakota Game, Fish and Parks (SDGFP) was initiated in 2014." Please provide any official correspondences that document the consultation completed.

Response: There is little record of official correspondence regarding early coordination and informal consultation with the agencies, as it largely consisted of phone calls and emails. All of the agencies identified were contacted in May and June 2014 with respect to data gathering for performing a desktop analysis of the Dakota Access Project. A South Dakota interagency agency meeting was held the last week in June in Pierre, SD where Dakota Access representatives first introduced the project and discussed regulatory requirements, schedules, etc; representative(s) from the SHPO's office and South Dakota Game, Fish and Parks were in attendance.

Correspondence between Dakota Access and the USFWS-SD field office consisted of phone calls and emails to discuss listed species and respective habitats, and permit coordination.

Dakota Access followed-up with the SHPO office in August to get approval on the proposed cultural resource survey protocols (copy of email correspondence is provided in response to 2-5 above), and routinely in 2014 to perform Class 1 literature reviews as were needed on route adjustments.

Early coordination with the SDNHP and SD Game, Fish and Parks Department consisted of phone calls and emails to discuss listed species and occurrence data to utilize during surveys and habitat assessments. The Department confirmed that no formal authorization from SDNHP and the SD Game Fish and Parks Department is required for the project.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

Request 2-8

In section 23.6 of the Application it is identified that reports detailing the comprehensive cultural resource filed investigations will be prepared that include recommendations for additional investigations to determine NHRP eligibility and/or avoidance measures. Please provide a copy of any report produced in accordance with this section of the application and any correspondence showing the reports were filed with SHPO for review.

Response: A Class III report for all survey activities performed in 2014 and 2015 was submitted to the SHPO on June 5, 2015; no comments have been received to date. A Class III report for all areas under jurisdiction of the USFWS easements in SD was provided to the USFWS Region 6 archeologist (May 7 for all but one tract that remained to be surveyed and an addendum for the outstanding tract on June 2); no comments on the reports have been received to date. This documentation was supplied in response to the Yankton Sioux response previously.

Prepared by: Monica Howard
Title: Director – Environmental Sciences
Address: 1300 Main Street Houston, TX 77002
Telephone Number: 713-989-7186

Dakota Access, LLC
Docket No. HP14-002

Response to South Dakota Public Utilities Commission
May 29, 2015, Request for Production of Documents No. 2
Request Numbers: 2-1 through 2-9

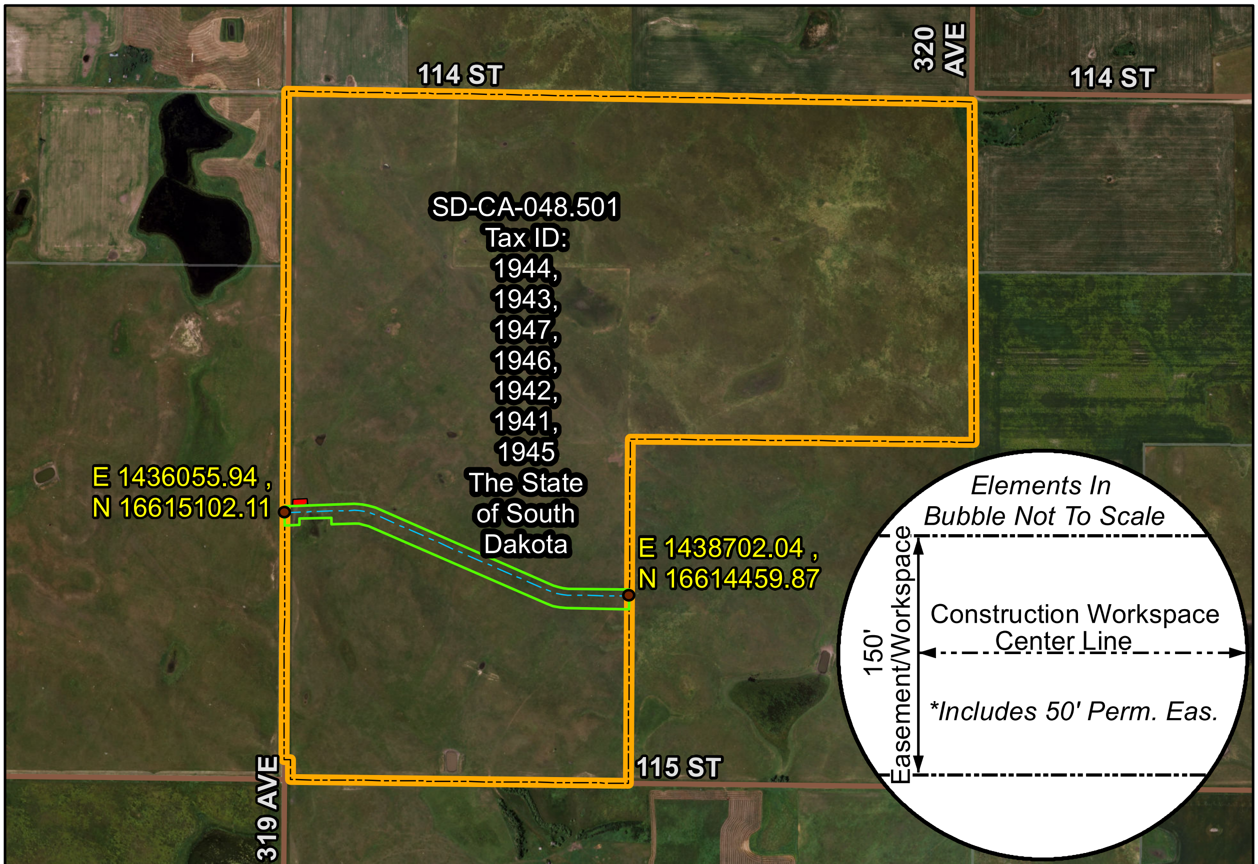
Request 2-9

Within the application, DAPL uses language such as "in the unlikely event of spill" (see pages 7, 26, 41, and 47 of application). Please provide a risk assessment, or other similar analysis, that shows the potential volumes, frequencies, and probabilities of spill events along the South Dakota portion of the proposed pipeline that supports the use of language identifying spills are unlikely.

Response: The spill model is currently under development and a draft version is being finalized. The spill model will allow the worst case discharge to be identified for the pipeline, which by definition, is highly improbable.

Prepared by: Todd Stamm
Title: Vice President – Pipeline Operations
Address: One Flour Daniel Drive Sugar Land, TX 77478
Telephone Number: 281-637-6581

Exhibit A
CAMPBELL COUNTY, SD
S16-R74W-T126N



ROW Length: 2778.03 Ft. = 168.37 Rods
Proposed Permanent Easement: 3.19 AC
Temp Easement/ Workspace: 6.1 AC
Add Temp Easement/ Workspace: 0.13 AC

Linear/Areal Calc = NAD 1983 UTM Zone 14N

Feet
0 1,000 2,000

Tract No.: SD-CA-048.501

DAKOTA ACCESS, LLC

Proposed Pipeline Easement Across:
The State of South Dakota

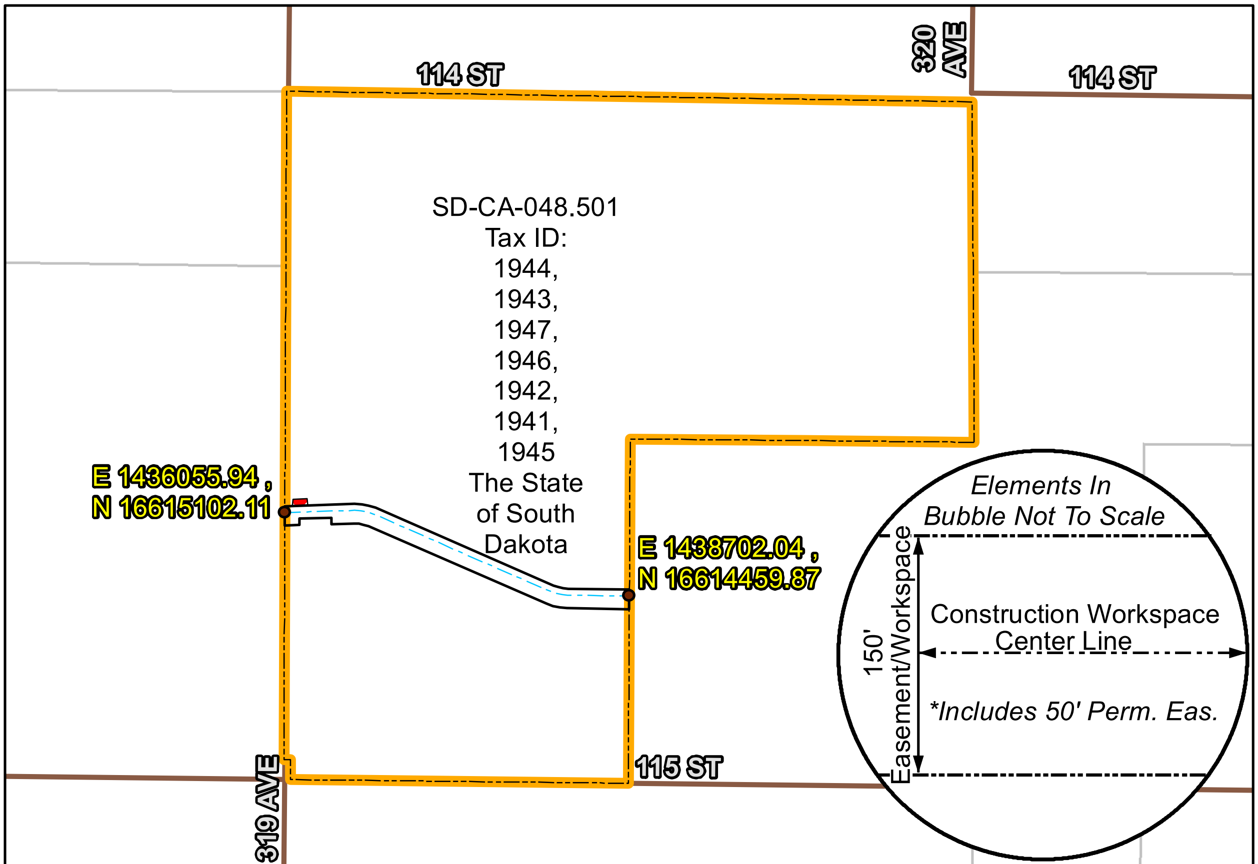
Entry/Exit
Centerline
Easement/Workspace
Property Boundaries
Additional Temporary Easement - Workspace
Adjacent Property Boundaries

Grantor hereby agrees that Grantee shall have the right to and is hereby authorized, with or without the joinder of Grantor, to file Exhibit A-1 by affidavit, to amend this Agreement to include such new Exhibit A-1 or to attach such new Exhibit A-1 to this Agreement, and to record or re-record such affidavit, amendment, or Agreement with the new Exhibit A-1. Grantee shall provide Grantor with a copy of the recorded affidavit, amendment or re-recorded Agreement.

____
Landowner Initials

Exhibit A

CAMPBELL COUNTY, SD
S16-R74W-T126N



ROW Length: 2778.03 Ft. = 168.37 Rods
Proposed Permanent Easement: 3.19 AC
Temp Easement/ Workspace: 6.1 AC
Add Temp Easement/ Workspace: 0.13 AC

Linear/Areal Calc = NAD 1983 UTM Zone 14N

Feet
0 1,000 2,000

Tract No.: SD-CA-048.501

N

DAKOTA ACCESS, LLC

Proposed Pipeline Easement Across:
The State of South Dakota

Entry/Exit
Centerline
Easement/Workspace
Property Boundaries
Additional Temporary Easement - Workspace
Adjacent Property Boundaries

Grantor hereby agrees that Grantee shall have the right to and is hereby authorized, with or without the joinder of Grantor, to file Exhibit A-1 by affidavit, to amend this Agreement to include such new Exhibit A-1 or to attach such new Exhibit A-1 to this Agreement, and to record or re-record such affidavit, amendment, or Agreement with the new Exhibit A-1. Grantee shall provide Grantor with a copy of the recorded affidavit, amendment or re-recorded Agreement.

____
Landowner Initials

SOUTH DAKOTA
STATE HISTORICAL SOCIETY
DEPARTMENT OF TOURISM

December 10, 2014

Beth McCord
Gray & Pape, Inc.
5807 North Post Road
Indianapolis, IN 46216

RE: Request for State Permit under the Archaeological Exploration Act (SDCL1-20) and the Cemetery and Burial Records Act (SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota

Dear Beth:

We have received your application for a Permit Under the Archaeological Exploration Act (39SDCL 1-20) and the Cemeteries and Burial Records Act (39SDCL 34-27) for the 2014 Dakota Access Project (DAPL), Campbell County, South Dakota on lands administered by the State of South Dakota. Please consider this you're your notice to proceed under SDCL1-120) and SDCL 34-27). Upon completion, please send a draft copy of the report for review addressed to myself (digital copy is acceptable) and a final hard copy report for our library.

This portion of South Dakota is archaeologically rich, most likely do to the net erosion in the area which reveals sites more abundantly that other locations in the state. Should you have any problems in the field please feel free to call on my personal cell 605-484-8341.

Stipulations: **1.** Culturally diagnostic artifacts recovered on state land will be collected, placed in a labeled bag and sent to me personally for curation. Do to the time constraint and my personal interest in this region of the state this will not require a curation agreement.
2. The identification of human remains are to be reported to law enforcement and this office.

Thank you for your continued support in the identification and protection of the cultural resources of South Dakota.

Sincerely,

Michael Fosha
Assistant State Archaeologist

Enclosure: SDCL 1-10 and SDCL 34-27 permit fee.

ARCHAEOLOGICAL RESEARCH CENTER
PO BOX 1257, 57709 • 217 KANSAS CITY ST, 57701 • RAPID CITY • SD • P {605 • 394 • 1936} • HISTORY.SD.GOV
DEPARTMENT OF TOURISM {TOURISM.SD.GOV}

DAKOTA ACCESS PIPELINE (DAPL) PROJECT
&
ENERGY TRANSFER CRUDE OIL PIPELINE (ETCOP) PROJECT

Stormwater Pollution Prevention Plan

DAKOTA ACCESS, LLC

June 2015

REV	DATE	DESCRIPTION	ORIG	CHK	APPR
A	8-26-2014	Issued for Review	JCD	JW	DJ
B	09-11-2014	Issued for Approval	JCD	JW	DJ
C	06-15-2015	Issued for Approval	JRF	MH	

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 Introduction

Dakota Access, LLC and Energy Transfer Crude Oil Company, LLC (COMPANY) will implement this Stormwater Pollution Prevention Plan (SWPPP) during construction of the Dakota Access Pipeline (DAPL) Project and the Energy Transfer Crude Oil Pipeline (ETCOP) Project (Project). The primary purpose of the SWPPP is to minimize the impacts of stormwater runoff during Project construction activities through the implementation of Best Management Practices (BMP).

1.1 Responsibility for Implementation

The Environmental Inspectors (EI) are responsible for directing, and inspecting efforts regarding implementation of the SWPPP and will fulfill the responsibilities as described herein. As stated in the construction contract or as otherwise agreed, once selected, the Construction Contractor (Contractor) will be responsible for all or part of the implementation of the SWPPP as described herein.

2.0 Site Description

2.1 Project Name, Location, and Purpose

Project Name: Dakota Access Pipeline (DAPL) Project and Energy Transfer Crude Oil Pipeline (ETCOP) Project.

Project Purpose: ETC's primary objective for the proposed Project is to allow for transport of approximately 400,000BPD of crude oil between Stanley, ND and Nederland, TX. The crude oil transported will provide supplemental crude oil supply for markets in the United States. In addition, the proposed project will open railroad transport for other products produced locally that otherwise would not be accessible to other markets.

Project Location: The DAPL and ETCOP projects consist of a Gathering Area, a Mainline Transmission Pipeline, and the Conversion of an existing natural gas transmission line to crude oil. The Gathering System commences at Stanley, North Dakota and ends at Johnson Corner, North Dakota. There are six proposed pump stations along the Gathering System, namely Stanley, Ramberg, Epping, Trenton, Watford City, and Johnson Corner. The Mainline Transmission Pipeline begins at Johnson Corner, North Dakota and ends southeast of the proposed Illinois Patoka Custody Transfer and Metering Station. Approximately 992 miles of mainline make up the DAPL project. The ETCOP project begins at the Patoka Custody Transfer and Metering Station and consists of approximately 24 miles of new Mainline Transmission Pipeline. This will eventually tie into the future expansion of 757 miles of conversion pipeline that extends from Johnsonville, Illinois to Nederland, Texas.

There will be tanks constructed at the six pump stations along the Gathering System. There will be one 50,000 barrel tank at Stanley, one 200,000 barrel tank and one 100,000 barrel tank at Ramberg, one 100,000 barrel tank at Epping, one 100,000 barrel tank at Trenton, two 100,000 barrel tanks at Watford City, and one 200,000 barrel tank at Johnson Corner.

There will be mainline valve sites on both sides of major water body and major highway crossings for isolation in the event of emergency shutdown. In addition to the mainline valves, multiple pump stations and one custody transfer metering station will also be installed along the Mainline Transmission Pipeline. The proposed custody transfer station will be located near Patoka, Illinois.

Launcher and Receiver traps will also be installed along the Mainline Transmission Pipeline at locations less than 100 miles apart.

A proposed rail yard and rail loading facility will also potentially be integrated into the DAPL project. The location of the rail yard will be on the east side of Historical Route 66 and on the west side of Niemanville Trail / Co Rd 225E in Litchfield, Illinois.

2.2 Nature of the Construction Activity

ETC proposes to install the new pipeline within a variable-width construction right-of-way (ROW). Actual workspace width will depend on site engineering and available workspace constraints. In general, the pipeline will be constructed using an approximate 150-foot-wide construction ROW, which includes a new proposed 50-foot-wide permanent easement and 100-foot-wide temporary easement. The temporary easement will be allowed to revert to its original land use following construction. All pump stations and mainline valve sites to be constructed will be located on tracts of sufficient size to accommodate all aboveground appurtenances along the ROW.

2.3 Sequence of Major Soil Disturbing Events

The following represents a typical sequence of major soil-disturbing events during the Project:

- Installation of stabilized construction entrances and surface water (including wetlands) protection BMPs.
- Clearing of the Project ROW area as necessary. This may include clearing of brush and trees to create ROW needed for temporary workspace, soil storage, construction activities, and areas needed for access to particular construction sites within the Project area.
- Topsoil removal and storage.
- Grading of the Project ROW as necessary. Areas of the ROW, including temporary workspace may be graded to allow the safe passage of equipment and meet the bending limitations of the pipe.
- Installation of additional BMPs for erosion and stormwater management, as needed.
- Pipe stringing, bending, welding, and testing.
- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth).
- Installation of pipe in ditch.
- Tie-ins of the sections of pipeline which will be welded together in the ditch.
- Backfilling the ditch line (excavated soil will be used to cover the pipe).
- Hydrostatic testing of the pipeline as necessary.
- Removal of temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.0 Controls

This section describes controls used to prevent or control stormwater pollution. The COMPANY BMPs are based on the current best accepted practices endorsed by the American Gas Association, Gas Research Institute, Association of Pipeline Contractors, EPA, and USACE. Appendix A contains diagrams showing typical installation of BMPs.

The Project's EI is responsible for determining the schedule and coordinating with the Contractor for placement of BMPs. The Contractor will stabilized disturbed portions of the site as soon as possible with appropriate BMPs, but in no case more than 14 days after construction activity has temporarily or permanently ceased on any portion of the site. An exception to this effluent limit is allowed if earth-disturbing activities will be resumed within 21 days. See Section 3.1.3 for more details regarding the BMPs installation timeframes. This plan will be updated by the Contractor, EI, and/or CI to identify the location and schedule of planned or installed controls as the need for these controls is determined.

The following represents a typical sequence of major soil-disturbing events during the Project and the control measures that will be implemented.

- Clearing of the Project area as necessary. This may include clearing of brush and trees in the ROW, in areas adjacent to the ROW needed for soil storage, and/or in areas needed for access to particular construction sites within the Project area. The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to any soil-disturbing activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Topsoil Removal and Storage. To minimize potential impacts on soil productivity, topsoil will be segregated during trench excavation in agricultural land, unsaturated wetlands, and if applicable, other areas where soil productivity is an important consideration. Unless otherwise requested by the landowner, topsoil will be removed to a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil in accordance with figures provided in Appendix A. After the trench is backfilled, topsoil will be returned to its approximate original location in the soil horizon.

- Grading of the Project area as necessary. Grading of the ROW may be necessary in areas where a level or tiered workspace is required to facilitate a safe working environment. Areas where grading occurs will be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable following construction. On steep slopes, or wherever erosion potential is high, temporary erosion control measures such as temporary slope breakers, silt fencing, and hay/straw bales will be implemented by the Contractor. Additional BMPs for erosion and stormwater management will be installed as needed based on existing site conditions.

- Excavation of ditch (trackhoes or similar equipment will be used to excavate the ditch to the required depth). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to excavation activities, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Backfilling the ditch line (excavated soil will be used to cover the pipe). The Contractor will implement such measures as temporary slope breakers, silt fencing, and hay/straw bales prior to backfilling, and will install additional BMPs for erosion and stormwater management, as needed based on existing site conditions.

- Performing cleanup and stabilization. This phase will begin after backfilling and will continue throughout the remainder of the Project's construction. This phase will include minor grading to level small areas, and revegetation. Project areas to be stabilized by vegetation will be seeded and mulched.
- The Contractor will remove temporary erosion/sediment controls when other construction activity is completed and final stabilization is achieved.

3.1 Erosion and Sediment Controls

3.1.1 Short and Long Term Goals and Criteria (as applicable)

(a) The construction phase erosion and sediment controls are designed to retain sediment on-site to the greatest extent practicable.

(b) Control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicate that a control has been installed and/or used inappropriately and/or incorrectly, the control shall be replaced and/or modified as needed.

(c) If sediment escapes the Project area, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impact (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

(d) Sediment must be removed from sediment traps when capacity has been reduced by 50 percent.

(e) Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

3.1.2 Temporary Erosion Control Measures

The following temporary erosion and sediment controls will be utilized as necessary:

Temporary Slope Breakers: Temporary slope breakers (water bars/terraces) will be installed as necessary (at the EI's discretion) diagonally across the ROW on slopes to control erosion by reducing and shortening the velocity, length and concentration of runoff according to the figures provided in Appendix A. These breakers will divert water to a well-vegetated area. If a vegetated area is not available, erosion control barriers will be installed to filter the runoff at the outlet of the slope breakers and off of the construction ROW. Silt fence, hay/straw bales, or sandbags may be used in place of temporary slope breakers at the discretion of the EI.

Natural vegetation acts as an effective filter medium for silt removal from surface runoff. Its use as a sediment barrier results in less disturbance to the land than other methods. In areas where natural vegetation is not present or does not constitute a suitable barrier, temporary sediment and/or erosion control barriers will be installed. Temporary sediment barriers, typically hay/straw bale filters or silt fences, dissipate the energy of flowing water to allow settlement of sediment from surface water runoff.

Silt Fence/Hay/Straw Bales: Silt fences and hay/straw bales will be installed in accordance with figures provided in Appendix A. The silt fences and/or hay/straw bales will be installed as necessary to prevent erosion and sediment laden runoff from stormwater discharges. These measures will remain in place until permanent revegetation measures have been judged successful.

Silt fence and hay bale structures are also used to control erosion and sedimentation for hydrostatic test water discharges. Bale filters are effective for small rills that can be spanned by one or two bales. Bales are constructed of hay (or straw) that is securely bound to form a berm, which is held in place by two stakes driven through each bale. The first stake is driven at an angle toward the previously positioned bale, and the second stake is driven perpendicular to ground surface. The bindings of the bales will be horizontal. Filter fabric fences (silt fences) perform the same function as hay bale berms, but have the advantage of ease of installation, versatility, and light weight.

A silt fence is a geotextile fabric with fence posts spaced no more than 10 feet apart. Both silt fences and hay/straw bales will be installed according to the manufacturer's instructions where site conditions allow. Otherwise, the silt fence will be imbedded in the ground a minimum of 6 inches. Where two sections are joined, they will be overlapped a minimum of 6 inches. Accumulated sediment will be removed regularly and the silt fencing inspected to ensure the bottom of the silt fence remains imbedded in the ground. A sufficient stockpile of silt fence will be maintained on-site for emergency use.

Hay bales may be left in place. These barriers are required after the initial disturbance of the soil and are typically installed at the following locations:

- At the outlet of a temporary slope breaker when vegetation is not enough to control erosion.
- Along banks of waterbodies between the graded ROW and the waterbody after clearing.
- Downslope of any stockpiled soil in the vicinity of waterbodies and wetlands.
- At the base of slopes adjacent to road crossings where vegetation has been disturbed.
- At sideslope and downslope boundaries of the construction where runoff is not otherwise directed by temporary slope breakers.
- In the ROW at boundaries between wetlands and adjacent disturbed upland areas to prevent flow of sediment into the wetland where runoff is not otherwise directed by a temporary slope breaker.
- At the edge of the ROW to prevent siltation of ponds, wetlands, or other waterbodies adjacent to the downslope of the ROW or as necessary to contain spoil and sediment within the ROW.
- For hydrostatic test water discharges, the water should be released directly into the silt fence/hay bale structures in conjunction with other approved velocity dissipating devices.

Temporary Trench Plugs: Temporary trench plugs prevent water diversion from waterbodies or drainage tiles into upland portions of the pipeline trench during construction and prevent silt-laden stormwater from flowing down the trench into waterbodies. The EI or CI will determine the need for and spacing of trench plugs. Otherwise, the Contractor will install hard trench plugs (undisturbed soil) on either side of waterbody crossings or drain tiles. Topsoil will not be used for trench plugs.

3.1.3 Stabilization Practices

The stabilization measures of the pipeline ROW incorporate permanent erosion and sedimentation measures. However, in the event that final restoration cannot be implemented immediately post-construction, temporary erosion and sedimentation control measures will be employed as specified by the Contractor until the weather is suitable for final cleanup.

For pipeline construction in areas with sloping terrain, COMPANY will use permanent trench plugs for soil stabilization.

3.1.3.1 Upland Areas

Temporary Stabilization:

- Temporary stabilization measures will be initiated as soon as practicable in portions of the ROW where construction activities have temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day is precluded by weather, stabilization measures will be initiated as soon as machinery is able to access the ROW. If activities resume within 21 days from when the activities ceased, stabilization measures do not have to be initiated by the 14th day following cessation of the activity. These guidelines are based on National Pollutant Discharge Elimination System (NPDES) requirements and may be modified based on state-specific PDES regulations.
- In the event that construction is completed more than 30 days before the seeding season for perennial vegetation, areas adjacent to waterbodies will be mulched with 3 tons/acre of straw, or its equivalent, to a minimum of 100 feet on either side of the waterbody. These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.
- Temporary sediment barriers may be removed from an area when that area is successfully revegetated (i.e., if the ROW surface condition is similar to adjacent undisturbed lands). These guidelines are based on NPDES requirements and may be modified based on state-specific PDES regulations.

Permanent Stabilization:

- Erosion and sedimentation control practices (installation of structures, revegetation, and maintenance practices) will be implemented to minimize the potential for soil erosion or sedimentation of streams and to restore the ROW and any other disturbed areas. Final grading will be completed within 10 days of construction completion (including the installation of permanent erosion control measures in the areas of steep slopes only), weather permitting. Construction debris will be removed from the ROW and the ROW will be graded so that the soil is left in proper condition for planting.
- The ROW on off-road sections will be graded to preconstruction contours, as practical, with a small crown of soil left over the ditch to compensate for settling, as approved by the CM, EI, and/or CI. Openings will be left in the completed crown to restore lateral surface drainage to preconstruction patterns.
- Where topsoil has been segregated, the topsoil will be spread back along the ROW in an even layer.
- Fences that were cut and replaced by gaps during construction will be repaired to at least their equivalent state during preconstruction activities.

- Permanent slope breakers will be constructed after final grading and prior to seeding in accordance with the applicable regulations to replace temporary barriers at pedestrian, trail, road, waterbody, and wetland crossings.

3.1.3.2 Revegetation and Seeding

Seed, fertilizer, and agricultural lime application will be accomplished at the following rates and mixtures unless otherwise instructed by applicable permits or land managing agency requirements:

- Seed Mixture: German Foxtail Millet "hulled" at a rate of 20 pounds per acre, with "hulled" Bermuda grass at a rate of 10 pounds per acre.
- Fertilizer: 5-19-19 at a rate of 300 pounds per acre.
- Agricultural Lime: at a rate of 2,000 pounds per acre.
- Final revegetation standards that will be used by COMPANY for stabilization of the ROW will be determined through discussions with the individual state and local agencies and through the permit process.
- The ROW will be seeded after final grading in accordance with recommended seeding dates, weather and soil conditions permitting.
- Turf, ornamental shrubs, and other landscaping materials will be restored in accordance with landowner agreements. Selection is based on adaptation of plants to the soils and climate, ease of establishment, suitability for specific use, longevity or ability to re-seed, maintenance required, aesthetic values, and landowner agreement. Personnel familiar with local horticultural and turf establishment practices must perform the restoration work.
- Where broadcast or hydro seeding is to be done, the seedbed will be prepared as necessary to ensure sites for seeds to lodge and germinate.
- Where hand broadcast seeding is used, the seed will be applied at one-half the rate in each of two separate passes.
- The seedbed will be prepared to a depth of 3 to 4 inches using appropriate equipment to provide a firm, smooth seedbed that is free of debris.
- The Project area should be seeded as deemed appropriate by the CM and/or EI. If seeding cannot be done soon after final grading, temporary erosion and sediment controls will be used and seeding of permanent cover will be done at the beginning of the next seeding season. Meanwhile, temporary stabilization measures will be implemented as appropriate.
- Slopes steeper than 3:1 will be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.
- Seed will be purchased in accordance with the Pure Live Seed (PLS) specifications for seed mixes and used within 12 months of testing.
- Legume seed will be treated with an inoculant specific to the species. The manufacturer's recommended inoculant rates will be used.
- The seed will be uniformly applied and covered 0.5 to 1 inch deep, depending on seed size. A seed drill equipped with cultipacker is preferred, but broadcast or hydro seeding can be used at double the recommended seeding rates. Where broadcast seeding is used, the seedbed will be firmed with a cultipacker, roller, or similar method after seeding.

- Other alternative seed mixes specifically requested by the landowner or land-managing agency may be used.
- Areas that are seeded after the recommended seeding date should be mulched if permitted.

3.1.3.3 Wetland Restoration

- COMPANY's approach to wetland mitigation and restoration involves a combination of impact minimization during construction, substrate and hydrology restoration, and vegetation establishment involving successful natural processes as a key component.
- The construction workspace for the Project will be been designed to limit impacts to wetlands.
- During the restoration phase, segregated topsoil will be replaced over the trenchline and wetland contours and drainage patterns will be restored to approximate original condition. Surface rocks and boulders that had been windrowed during the construction phase will be distributed in a natural pre-construction configuration in the temporary work areas. Following restoration of the substrate, wetlands will typically be seeded with annual ryegrass or other seed mixture as directed by regulatory agencies.

3.1.3.4 Riparian Areas

Riparian areas are defined as "on or pertaining to the bank of a natural course of water" (stream, pond, lake, or wetland). The EPA defines "riparian areas" as areas adjacent to streams and lakes where the high water table creates distinct soil and vegetative characteristics from the adjacent uplands.

- Following installation of the pipeline, stream banks and riparian areas will be re-contoured and stabilized. Banks will typically be stabilized with an herbaceous mixture and erosion control fabric such as jute netting. Rock riprap may be used to stabilize particularly erosive or unstable areas at the recommendation/approval of the state agencies and by the USACE.

3.1.4 Other Surface Applications

Other surface applications will be applied as outlined below unless otherwise instructed by applicable permits or land managing agency requirements:

(a) Mulch: After seeding, mulch may be applied by the Contractor as determined necessary by the EI at a rate of approximately 2 tons/acre on the entire ROW except on wetlands, lawns, agricultural crop areas, and areas where hydro-mulch is used. Mulching before seeding may be done if construction or restoration activity is interrupted for an extended period, such as when seeding cannot be completed due to seeding period restrictions. Except for site-specific locations that may be identified during construction, mulch before seeding if final cleanup (including final grading and installation of permanent erosion controls in the areas of steep slopes) is not completed in an area within approximately 10 days after construction completion.

If mulching occurs before seeding, the Contractor shall increase mulch application on slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre. Up to 1 ton/acre of wood chips may be added to mulch if areas are top-dressed with 11 pounds/acre available nitrogen (at least 50 percent of which is slow release).

If a mulch blower is used, the strands will not be shredded to less than 8 inches in length to allow anchoring. The mulch will be anchored immediately after placement to minimize loss by wind and water. When anchoring by mechanical means, the Contractor shall use a mulch-anchoring tool to properly crimp the mulch to a depth of 2 to 3 inches. When anchoring with liquid mulch binders, the Contractor shall use the rates recommended by the manufacturer. The Contractor shall not use liquid mulch binders within 100 feet of wetlands or waterbodies.

(b)Matting/Netting: Matting or netting consists of jute, wood excelsior, or similar materials, and will be installed by the Contractor to anchor mulch and stabilize the surface of the soil during the critical period of vegetative establishment, where directed by the EI.

Matting or netting will be applied to critical, sensitive areas (e.g., steep slopes, banks of waterbodies, bar ditches) as specified by the EI. On waterbody banks, the matting or netting will be installed at the time of the final bank re-contouring. In the event that erosion control fabric is not readily available, the Contractor will temporarily use mulch anchored via crimping (or some other means) or hydromulch until the erosion control fabric material becomes available. Matting or netting will be anchored with pegs or staples as recommended by the manufacturer.

3.2 Stormwater Management

Stormwater management will be conducted through stormwater flow attenuation, velocity dissipation devices, and water filtration. COMPANY's construction procedures describe the criteria for placement and use of stormwater control methods/devices. The EI will have the authority to determine the location of these controls.

If herbicides or pesticides are to be used for vegetation maintenance, the applications of those substances will be in accordance with applicable landowner and land management or state agency specifications. COMPANY will not use herbicides or pesticides in or within 100 feet of any waterbody except as specified by the appropriate land management or state agency.

3.3 Other Controls

3.3.1 Waste Materials

(a) Trash, litter, and debris will be collected for off-site disposal; it will not be discarded along the ROW. Refuse will be disposed of according to state and local regulations.

(b) Solid waste that contains (or at any time contained) oil, grease, solvents, or other petroleum products, falls within the scope of the oil and hazardous substances control, cleanup, and disposal procedures of COMPANY's Spill Prevention Control and Countermeasures (SPCC) plan. This material shall be segregated for handling and disposal as hazardous waste under the provisions of the plan.

3.3.2 Offsite Vehicle Tracking

(a) A stabilized construction entrance will be used, if appropriate, to reduce vehicle tracking of soil and sediments. Access to the ROW will normally be from existing public roads. Attempts will be made to locate roadway crossings/access points to ensure that safe and accessible conditions exist throughout the construction phase. Use of 50-foot-long crushed stone access pads, sweeping, culvert installation, matting, and other forms of rutting protection may be used subject to local permit conditions. Periodic sweeping and scraping will remove sediment tracked onto public roads. If crushed stone access pads are used in active agricultural areas, the stone will be placed on a synthetic fabric to facilitate later removal.

(b) The stabilized construction entrances will be installed before clearing and grading. Once other construction activities permanently cease in an area, that area will be stabilized by reseeding and/or mulching as needed. Once revegetation has been judged successful, temporary erosion/sediment control structures will be removed.

4.0 Maintenance

Erosion and sediment control measures and other protective measures identified in this SWPPP must be maintained in effective operating condition. If site inspections required by Section 5 of this SWPPP identify erosion control devices that are not operating properly, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of erosion controls. If maintenance prior to the next anticipated storm event is impractical, maintenance must be scheduled and accomplished as soon as practicable. Temporary sediment barriers will remain in place until permanent revegetation measures have been judged successful.

5.0 Inspections

The EI will inspect disturbed areas of the Project area that have not been finally stabilized (including areas used for storage of materials that are exposed to precipitation, staging areas, temporary contractor yards, access roads, structural control measures, and locations where vehicles enter or exit the site). The Project area should be considered stabilized when construction activity ceases and a uniform vegetative cover (see below) has been established.

Areas that are not revegetated should be considered to have achieved final stabilization when they have a permanent cover that will prevent erosion of soil by wind or water. At that time, activity under this plan, including inspections, will cease. Inspections shall be conducted as follows and/or in accordance with the applicable National or State-Specific Pollution Discharge Elimination System guidelines:

- Conduct **daily inspections and following any storm event of 0.5 inch of precipitation or greater**, except those portions of the site that have been finally or temporarily stabilized, for which inspections will be conducted at least weekly. Inspections should continue until disturbed areas are completely stabilized (for areas to be revegetated, this means that perennial vegetation cover has reached a uniform cover of at least 70 percent of the preconstruction cover).

- **Inspect control measures** daily in areas of active construction or equipment operation and on a weekly basis in areas with no construction. Inspect within 24 hours of the end of a storm event that is 0.5 inch of rainfall or greater. Control measures will be maintained in good working order; if repair is necessary, it should be initiated within 24 hours of report.

- **Inspect disturbed** areas for evidence of or potential for pollutants entering the drainage system. Sediment from silt fences should be removed regularly and the fence inspected to ensure that the bottom of the fence remains imbedded in ground. Damaged hay/straw bales will be replaced with new bales as necessary.

- **Inspect material storage areas** where materials are exposed to precipitation for evidence of potential for pollutants entering the drainage system.

- **Inspect vehicle entrances** for evidence of off-site sediment tracking.
- **Inspect discharge points**, if accessible, to determine if erosion control measures are effective in preventing significant impacts to receiving waters. If these points are inaccessible, inspectors should inspect nearby downstream locations.
- **Inspect vegetation** after the first and second growing season after seeding to determine the success of revegetation. Wetland revegetation is considered successful if at least 80 percent of the total cover is native species and the level of diversity of the native species present after construction is at least 50 percent of the level originally found in the wetland. Restoration shall be considered successful if the ROW surface condition is similar to adjacent undisturbed lands.
- **Complete an inspection report** of each inspection. Inspection forms and form instructions provided in Appendix C provide additional guidance.

See Section 7 for additional detail on requirements for construction activity and inspection documentation and record keeping.

6.0 Plan Modification

This plan may need to be modified and/or updated based on information and experience gathered during actual construction activities (e.g., include or modify BMPs designed to correct problems, etc.). If changes to the design, construction, or maintenance that can have significant effect on the potential for discharging pollutants in stormwater at the site occur, this plan should be modified accordingly by the Contractor, EI, and/or CI. In addition, if the plan proves to be ineffective in controlling pollutants, any necessary modifications to the application of the practices presented in this plan should be made by the Contractor, EI, and/or CI in order to prevent the discharge of pollutants into stormwater.

7.0 Required Reports, Documentation, and Record Keeping

7.1 Records Retention

All permit-related documents will be retained as part of the SWPPP for at least three years from the date that the site is finally stabilized as required by COMPANY's document retention policies. The following documentation will be kept on file at the construction site:

- A copy of this SWPPP and referenced attachment(s)
- Inspection reports
- Log of construction and BMP installation/maintenance activities and/or construction alignment sheets/construction plans showing the placement of BMPs.
- Notice of Intent and Notice of Termination (if applicable)

7.2 Inspection Reports

A separate report will be developed for each inspection. Inspection reports will identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report will contain a certification that the facility is in compliance with this SWPPP. In addition, inspection reports should:

- Summarize the scope of the inspection.

- Provide the name(s), title(s), and qualifications of personnel making the inspection.
- Indicate the date(s) of the inspection.
- Provide weather information and a description of any discharges occurring at the time of the inspection.
- Provide weather information for the period since the last inspection (or since commencement of construction activity if first inspection), including:
    - A best-estimate of the beginning of each storm event
    - Duration of each storm event
    - Approximate amount of rainfall for each storm event (in inches)
    - If any discharges occurred
- Indicate the location(s) of discharges of sediment or other pollutants from the site.
- Indicate the location(s) of BMPs that need to be maintained.
- Indicate the location(s) of BMPs that failed to operate as designed or proved inadequate for that particular location and plans for correction of the problem (including implementation dates of corrective action).
- Indicate location(s) where additional BMPs are needed that did not exist at the time of inspection.

7.3 Log of Construction and BMP Installation and Maintenance Activities

In addition to inspection and maintenance reports, keep a record of construction activity on the site with this SWPPP. In particular, keep record of the following:

- The dates when major grading activities occur in a particular area.
- The date when construction activities cease in an area, temporarily or permanently.
- The date when an area is stabilized, temporarily or permanently.
- Erosion control maintenance activities.

8.0 SWPPP Certification

8.1 Company's Certification

I certify under penalty of law that this document and its appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: ______________________________________ Date:____________________

Print Name: ______________________________________

Title: ______________________________________

Company: ______________________________________

8.2 Contractor's/Subcontractor's Certification

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: ______________________________ Date:____________________

Print Name: ______________________________

Title: ______________________________

Company: ______________________________

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: ______________________________ Date:____________________

Print Name: ______________________________

Title: ______________________________

Company: ______________________________

I certify under penalty of law that I understand the terms and conditions of the governing PDES permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signed: ______________________________ Date:____________________

Print Name: ______________________________

Title: ______________________________

Company: ______________________________

APPENDIX A

BEST MANAGEMENT PRACTICES FIGURES

APPENDIX B

SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN

APPENDIX C

INSPECTION FORMS AND INSTRUCTIONS

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Signature of Inspector: ______________________________________

Printed Name of Inspector: ______________________________________

Title of Inspector: ______________________________________

Qualifications of Inspector: ______________________________________

Date: ______________________________________

Current Weather Information:______________________________________

Weather Information Since Last Inspection: ______________________________________

Beginning Date/Time of Last Storm Event:_________________________________

Duration of Last Storm Event:_____________________________________

Amount of Rainfall: ______________________________________Inches

Discharges Since Last Inspection/Storm Event:____________________________________

NOTE: Inspection documents are to be maintained for a minimum of 3 years.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

<u>Earth Dikes/Berms</u>

Is the dike stabilized? ____

____

Is there evidence of washout or over-topping? ______________________________

____

If water is present in the drainage ports, does it:

- Have a sheen on it? ____________________
- Have an acceptable TDS? ____________________
- Show excessive turbidity? ____________________

Maintenance required for Earthen Dike: ________________________________

____

____

To be performed by: __________________________ On or before: __________________________

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

<u>Roads and Locations Where Vehicles Enter or Exit the Construction Site</u>

Are sediment traps or barriers along road construction zones preventing runoff into adjacent wetlands, lakes, etc.?____

____

____

____

At locations where construction equipment exits onto paved roads, are the existing best management practices successfully minimizing off site tracking of sediments? _______________

____

____

____

Maintenance Required: ____

____

____

To be performed by: ________________________On or before: ________________________

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Straw Bale and Filter Fence Barriers

Do the barriers have tears or holes in them? ______________________________

Are there any missing barriers? ______________________________

Are the barriers properly aligned? ______________________________

Where sediment has reached one-third the height of the barrier, has it been removed? __________

____

Have straw bales with excessive sediment saturation been replaced? ______________

____

Maintenance required for barriers: ______________________________

____

____

To be performed by: ______________________On or before: ______________

SWPPP Upgrades:

If any deficiencies in pollution control structures or procedures were identified above, have those deficiencies been corrected and the Storm Water Management Plan modified, if appropriate?

Explain: ____

____

____

____

____

____

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

General

Have there been any uncontrolled releases of mud or muddy water or measurable quantities of sediment found off site? __________Yes _____________No

If **Yes**, describe measures taken to clean up fugitive sediment: ____________________________

____

____

____

____

If **Yes**, describe measures taken to prevent a future occurrence: ___________________________

____

____

____

____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Location	Diversion Structure	Sediment Trap	Date Excavated	Date Filled	Date Dressed	Signs of Erosion	Stabilized ?	Ground Covered?	Date of Inspection

NOTE: If signs of erosion become apparent, stabilize by backfilling and leveling and use of mulch, sod, seeding, or other means of preventing further erosion.

Date: ____________________ Inspector's Name (Print and Initial) ____

Project

Storm Water Pollution Prevention Plan

Inspection and Maintenance Report

Maintenance required for: ______________________________

____

____

____

To be performed by: ____________________ On or before: ____________________

NOTE: Modifications to control measures must be made no more than 7 days after the inspection.

NOTE: Inspection documents are to be retained for a minimum of 3 years.

NOTE: Check flowline trenches for the following:

- Settlement below natural grade
- Washouts of spoil along excavated trenches
- Muddy/contaminated rainwater
- Placement of spoil upslope of trench

GEOENGINEERS

Memorandum

3050 South Delaware, Springfield, Missouri 65804, Telephone: 417.831.9700, Fax: 417.831.9777 www.geoengineers.com

To:	Tom Siguaw, Dakota Access, LLC
From:	Craig Erdman, Mark Miller and Jon Robison
Date:	June 12, 2015
File:	18782-011-00
Subject:	Dakota Access Pipeline Project – Response to Interrogatory 2-12 from the South Dakota Public Utilities Commission Regarding Special Construction Techniques in Karst Terrain

We understand that Dakota Access, LLC (DAPL) has received the following interrogatory from the South Dakota Public Utilities Commission (SDPUC) regarding special construction techniques that might be used in areas of karst terrain:

Interrogatory 2-21

Referring to the excerpt from the Application provided below, as found on page 14 of the Application, please define "specialized construction techniques." Would this include some kind of poly wrap or coating?

"As outlined in Section 14.7 – Seismic and Subsidence, desktop studies have identified a potential for karst geology along certain portions of the route. Dakota Access will conduct pre-construction training to educate personnel on the identification of karst features during excavation. If karst features are identified along the route, Dakota Access will take steps to ensure the integrity of the pipeline, which may include realignment or specialized construction techniques."

Response:

In general, although the proposed DAPL alignment does pass through some regions where karst is possible based on the underlying bedrock geology, we believe the risk of encountering karst-related voids or other features during the construction process to be low. See GeoEngineers memorandum titled "Response to South Dakota Public Utilities Commission, Dakota Access Pipeline Project - Proposed Pipeline in South Dakota," dated April 17, 2015. Should karst related voids be encountered, however, a geotechnical professional or geologist should be consulted to provide input and site-specific mitigation measures. These measures might include minor alignment adjustments (if possible) to avoid the feature, or specialized construction techniques such as the following:

1. Over-excavating the trench and then placing biaxial geosynthetic grid (geogrid) across shorter intervals of openings in the rock, placing crushed rock over the geogrid and compacting, then placing pipeline bedding material over the crushed rock,
2. Filling small to modest sized voids (up to perhaps 30 cubic yards in volume) with a flowable fill (lean mix concrete).

We recommend addressing caves, or other significant karst features, if encountered, on a case-specific basis with a geo-professional as described above.

UNANTICIPATED DISCOVERIES PLAN CULTURAL RESOURCES, HUMAN REMAINS, PALEONTOLOGICAL RESOURCES & CONTAMINATED MEDIA

Dakota Access Pipeline Project (DAPL)

A. INTRODUCTION

Dakota Access, LLC is proposing to install approximately 1,100 miles of 12- to 30-inch pipeline from Stanley, North Dakota, crossing South Dakota and Iowa, to an existing tank hub near Patoka, Illinois crossing South Dakota and Iowa as well.

This document describes the procedures for dealing with unanticipated discoveries during the course of project construction. It is intended to:

- Maintain compliance with applicable Federal and State laws and regulations during construction of the Project;

- Describe to regulatory and review agencies the procedure the project or its representative will follow to prepare for and deal with unanticipated discoveries; and,

Provide direction and guidance to project personnel as to the proper procedure to be followed should an unanticipated discovery occur.

B. PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES

In the event that any member of the construction work force believes that a cultural resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet both sides of the discovery will immediately stop and the Environmental Inspector (EI) will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A cultural resource can be prehistoric or historic and could consist of, but not be limited to, for example:
    - An accumulation of shell, burned rocks, or other subsistence related materials
    - An area of charcoal or very dark soil with artifacts
    - Stone tools, arrowheads, or dense concentrations of stone artifacts
    - A cluster of bones in association with shell, charcoal, burned rocks, or stone artifacts
    - A historic structure or assemblage of historic materials older than 50 years

2. If the EI believes that the discovery is a cultural resource, the EI will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work or exclusion zone, as well as notifying the Environmental Project Manager and/or Company

Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.

3. Dakota Access or its representative will arrange for the discovery to be evaluated by a qualified archaeologist in accordance with applicable regulations. The archaeologist will evaluate the remains and provide recommendations for how to manage the resource under the appropriate State's Historic Preservation Plan.

4. If the discovery is within an area of federal jurisdiction, the appropriate federal agency will be consulted. If the discovery is determined to have the potential for eligibility, the archaeologist and Dakota Access will also consult with the SHPO on how best to avoid, minimize, or otherwise mitigate further impacts. Treatment measures may include mapping, photography, sample collection, or excavation activity.

5. The archaeologist will implement the appropriate treatment measure(s) and provide a report on its methods and results as required. The investigation and technical report will be performed in compliance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734--44737); the Advisory Council on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the applicable State(s) Historic Preservation Office.

C. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects set forth by the National Historic Preservation Act (Public Law [PL] 89-665), its implementing regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); the Native American Grave and Repatriation Act (43 CFR Part 10); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act; and Consultation and Coordination with Indian Tribal Governments (EO 13175): South Dakota's state burial law (South Dakota Codified Law [SDCL] 34-27) and its accompanying Administrative Rules (ARSD 24:52).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials or the State Archaeologist. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect. If any member of the construction work force believes that human remains are encountered the following plan will be implemented:

1. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized individuals.

2. The EI will be notified and responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone.

No activity may resume until authorized by the agency authority governing the disposition of the human remains.

3. The EI will notify the Project Environmental Manager, who will contact the Project archeologist, specific county law enforcement agency and the coroner of the jurisdiction where the site or remains are located. The State Archaeologist will also be contacted to assist with identifying the remains.

4. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, a the Environmental Project Manager will notify the appropriate federal agency with jurisdiction and/or SDSHPO to assist in determining the tribe(s), if any, who may have historic ties to the region and represent descendants of any Native American remains. If direct relations to a Native American tribe are verified, the tribe will have control of the disposition of the human skeletal remains.

5. If the District Coroner finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the SHPO will have jurisdiction of the site, human skeletal remains, and the burial artifacts.

D. PROCEDURES FOR THE DISCOVERY OF PALEONTOLOGICAL RESOURCES

In the event that any member of the construction work force believes that a paleontological resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet both sides of the discovery will immediately stop and the EI will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A paleontological resource would be expected to be in the form of fossils. In-situ fossils are usually found within layers of geologically old sediments and rocks where the creature lived, died, and became fossilized. However, through geologic, hydrologic, and marine activity, many fossils and parts of fossils have been carried into younger geologic areas.

2. If the EI believes that the discovery is a paleontological resource, the EI will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work or exclusion zone, as well as notifying the Environmental Project Manager and/or Company Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.

3. The Project Environmental Manager will arrange for the discovery to be evaluated by a qualified geologist/paleontologist in accordance with applicable regulations. The geologist/paleontologist will evaluate the remains and provide recommendations for how to manage the resource.

4. If the find is on state land, the Project Environmental Manager will notify the land managing state agency and the South Dakota Geological Survey, pursuant to South Dakota’s Codified Law 5-1-20, which addresses the need to obtain a permit to record, excavate, or collect paleontological resources on state land. If the find is on federal or municipal land, the Project Environmental Manager will

inform the appropriate land managing agency of the find. Treatment measures may include mapping, photography, sample collection, or excavation activity. The geologist/paleontologist will implement the appropriate treatment measure(s) and provide a report on its methods and results as required.

E. PROCEDURES FOR THE DISCOVERY OF CONTAMINATED MEDIA

Indicators of possible contamination include, but are not limited to:

- Buried drums or containers, rusted or in otherwise poor condition
- Stained or otherwise discolored soil (in contrast to adjoining materials)
- Spoil material containing debris other than obvious construction material
- Chemical or hydrocarbon odors emanating from excavations
- Oily residues
- Visible sheen or other discoloration on groundwater
- Structures such as pipelines (concrete, PVC or steel) or underground storage tanks.

The EI and appropriate contractor personnel will be trained in hazard identification and worker protection and these topics will be discussed regularly in safety meetings. A desktop assessment for contaminated along the Project route indicated that contamination it not likely to be encountered during construction. In the unlikely event that contamination is encountered the following activities should take place:

1. Immediately cease construction activities within that area and notify the EI and Project Environmental Manager. Work in the immediate area will not resume until an assessment of the discovery has been completed and the Company has released the site. If safe to do so, the EI will take appropriate steps to mark (flag) off the area to identify the exclusion zone. Work in the immediate area will not resume until an assessment discovery has been completed.

2. If potentially contaminated groundwater or soil reaches (or has the potential to reach) surface waters, booms and/or absorbent materials shall be immediately deployed to contain and reduce downstream migration of the spilled material.

3. Upon notification, the Project Environmental Manager will perform or direct a hazard assessment to determine appropriate control measures to be implemented at the specific site. Activities may include sampling vapors, soil, sediments, groundwater, and/or wipe samples of materials.

4. If warranted by the assessment, the Project Environmental Manager will notify appropriate Federal, State and Local agencies.

5. Company or the designated person(s) will make appropriate notifications to regulating agencies as necessary. Upon evaluation of the sampling results, additional notifications may be made to coordinate a work plan for measures to be implemented in the contaminated area to resume activities in a safe, environmentally compliant, and effective manner. Measures may include additional personal protective equipment, segregation of contaminated media, treatment or off-site disposal of contaminated media.

6. All identification /characterization, handling, labeling, storage, manifesting, transportation, record keeping, and disposal of potentially contaminated materials shall be conducted in accordance with all applicable federal, state, and local regulations and guidance.

F. PROJECT CONTACTS

Environmental Inspector

Contact: TBD Prior to Construction
Telephone
Email:
Address:

Chief Inspector

Contact: TBD Prior to Construction
Telephone
Email:
Address:

DAPL Project Manager

Contact: Jack Edwards
Telephone (o) 515-777-7723 (c) 832-421-5691
Email: Jack.Edwards@energytransfer.com
Address: 1300 Main Street, Houston, TX 77002

DAPL Project Environmental Manager

Contact: Monica Howard
Telephone (o) 713-989-7186 (c) 713-898-8222
Email: Monica.howard@energytransfer.com
Address: 1300 Main Street, Houston, TX 77002

DAPL Retained Archeologist, Gray & Pape

Contact: Beth McCord
Telephone: (o) 317-541-8200
E-mail: bmccord@graypape.com
Address: 5807 North Post Road, Indianapolis, IN 46216

South Dakota State Historic Preservation Program

Contact: Jay D. Vogt/SHPO
Telephone: (605) 773-3458
E-mail: Jay.Vogt@state.sd.us
Address: South Dakota State Historical Society
900 Governors Dr. Pierre, SD 57501

South Dakota Geological Survey

Contact: Derric Iles, State Geologist
Telephone: (605) 677-5227
Email: diles@usd.edu
Address: Akeley-Lawrence Science Center
414 East Clark Street, Vermillion SD 57069

County Sherriff Department Contacts

County	Sherriff	Address	Phone	Fax
Campbell	Lacey Perman	P.O. Box 161, Mound City, SD 57646	605-955-335	605-955-3308
McPherson	David Ackerman	P.O. Box 158 Leola, SD 57456	605-439-3400	605-439-3632
Edmunds	Todd Holtz	P.O. Box Ipswich, SD 57451	605-426-6262	605-426-6257
Faulk	Kurt Hall	924 Lafoon Ave Faulton, SD 57438	605-598-6229	605-598-6620
Spink	Kevin Schurch	210 E 7th Ave, Suite 1 Redfield, SD 57469	605-472-4595	605-472-4599
Beadle	Doug Solem	455 4th St SW, Rm #100 Huron, SD 57350	605-353-8424	605-353-8427
Kingsbury	Kevin Scotting	P.O. Box 136 De Smet, SD 57231	605-854-3339	605-854-9307
Miner	Lanny Klinkhammer	P.O. Box 366 Howard, SD 57349	605-772-4501	605-772-4148
Lake	Tim Walburg	200 E Center St Madison, SD 57042	605-256-7615	605-256-7617
McCook	Mark Norris	P.O. Box 58 Salem, SD 57058	605-425-2761	605-425-3144
Minnehaha	Mike Milstead	320 W 4th St Sioux Falls, SD 57104	605-367-4300	605-367-7319
Turner	Byron Nogelmeier	P.O. Box 580 Parker, SD 57053	605-297-3225	605-297-3871
Lincoln	Dennis Johnson	128 N Main St, Suite 200 Canton, SD 57013	605-764-5651	605-764-2767

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Monday, August 18, 2014 10:43 AM
To: 'Beth McCord'
Cc: Abby Peyton
Subject: RE: DAPL proposed SOW

Good morning,

Thank you for the opportunity to review the proposed scope of work. I do have several comments that I hope can be taken into consideration.

1. My first comment concerns the use of at least one shovel test to provide information on a site's integrity. If the goal is to determine a site's integrity (vs. presence / absence) I would recommend using a 1x1 in an area with the best potential for intact subsurface deposits.
2. Is it possible to be informed when your survey methods are refined based on what you're seeing in the field?
3. I recommend gathering GPS coordinates for all shovel tests, not just positive shovel tests.
4. On the second page, 8th paragraph, last sentence, "Should an eligible resource not be avoided we will submit a separate work plan for SHPO comment and approval prior to testing." Can you please explain why testing will be conducted if the sites determined eligible?

Finally, the Archaeological Research Center's database should reflect the most up to date information from the mortuary surveys. If you find that this is not the case please let me know.

Thanks,
Paige

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Friday, August 15, 2014 1:40 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: DAPL proposed SOW

Paige,

Thanks for meeting with us. We certainly benefitted from the conversation. I wanted to present our proposed scope of work for your comment based on our meeting. I have attached it for your review. Our approach is to run this as a

Section 106-like project. Please let me know if you have any comments or require clarification on these procedures. We are hopeful that this approach will satisfy the SHPO.

I also wanted to inquire on how we might receive copies of the recent mound surveys you mentioned. We will be crossing Beadle, Campbell, Edmunds, Faulk, Kingsbury, Lake, Lincoln, McCook, Minnehaha, Miner, McPherson, and Spink counties. Any information from these counties would be great.

We look forward to working with you.

Thank you,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.
ARCHAEOLOGY · HISTORY · HISTORIC PRESERVATION

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Beth McCord <bmccord@graypape.com>
Sent: Wednesday, June 03, 2015 2:23 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: RE: Areas with buried site potential
Attachments: SD DAPL Geoarchaeological Methods.pdf

Paige,

Attached is the plan for your review. Please let me know if you need any additional information or have questions.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Wednesday, June 03, 2015 9:37 AM
To: Beth McCord
Subject: RE: Areas with buried site potential

Hi Beth,

It really depends on when you submit the methods. I will be out of the office next Tuesday – Friday. But in general the review would probably take a day or two.

Thanks,
Paige

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Tuesday, June 02, 2015 3:28 PM
To: Olson, Paige
Subject: Areas with buried site potential

Paige,

As we mentioned in the management summary for the DAPL project we have a couple of stream crossings that have low energy deposition and have the potential for buried cultural deposits. Currently, the streams will not be avoided by HDD. In the scope of work for the Level III survey we submitted to you in August, we had noted that we would submit a work plan to conduct the geoarchaeological assessment for your review. We believe the best method to identify cultural deposits will be a few backhoe trenches at each location. I was wondering when we submit our methods how long it would take you to review the plan. Could you let me know?

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.
ARCHAEOLOGY • HISTORY • HISTORIC PRESERVATION

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

Abby Peyton

From: Olson, Paige <Paige.Olson@state.sd.us>
Sent: Friday, June 05, 2015 2:14 PM
To: 'Beth McCord'
Cc: Abby Peyton; Haug, Jim; Fosha, Mike
Subject: RE: Areas with buried site potential

Thank you for the opportunity to review the proposed methods for identifying deeply buried deposits. I have no concerns with the proposed methods provided that the trenching matches or exceeds the depth of the pipeline.

Thank you,

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501
(605) 773-6004

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Wednesday, June 03, 2015 2:23 PM
To: Olson, Paige
Cc: Abby Peyton
Subject: RE: Areas with buried site potential

Paige,

Attached is the plan for your review. Please let me know if you need any additional information or have questions.

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

From: Olson, Paige [mailto:Paige.Olson@state.sd.us]
Sent: Wednesday, June 03, 2015 9:37 AM
To: Beth McCord
Subject: RE: Areas with buried site potential

Hi Beth,

It really depends on when you submit the methods. I will be out of the office next Tuesday – Friday. But in general the review would probably take a day or two.

Thanks,
Paige

From: Beth McCord [mailto:bmccord@graypape.com]
Sent: Tuesday, June 02, 2015 3:28 PM
To: Olson, Paige
Subject: Areas with buried site potential

Paige,

As we mentioned in the management summary for the DAPL project we have a couple of stream crossings that have low energy deposition and have the potential for buried cultural deposits. Currently, the streams will not be avoided by HDD. In the scope of work for the Level III survey we submitted to you in August, we had noted that we would submit a work plan to conduct the geoarchaeological assessment for your review. We believe the best method to identify cultural deposits will be a few backhoe trenches at each location. I was wondering when we submit our methods how long it would take you to review the plan. Could you let me know?

Thanks,

Beth McCord
Senior Principal Investigator, Archaeology
Indiana Branch Manager

GRAY & PAPE, INC.
ARCHAEOLOGY • HISTORY • HISTORIC PRESERVATION

5807 North Post Road
Indianapolis, IN 46216
Phone: 317.541.8200
Cell: 513.484.8156

June 11, 2015

Jim Haug
Archaeological Research Center
South Dakota State Historical Society
217 Kansas City Street
Rapid City, SD 57701

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

Dear Mr. Haug,

On behalf of Dakota Access, LLC, we are submitting the draft report referenced above. The survey was conducted in coordination with the state Public Utilities Commission requirements in compliance with SD 1-19A-11.1. Dakota Access, LLC is independently coordinating with federal agencies for Section 106 requirements for those portions of the Project that traverse federally-managed easements or jurisdictional areas.

A copy of the report has also been submitted to the Paige Olson at the SHPO office. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com

June 11, 2015

Paige Olson
Review and Compliance Coordinator
South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501

RE: Level III Intensive Cultural Resources Survey of Dakota Access Pipeline Project for Campbell, McPherson, Edmunds, Faulk, Spink, Beadle, Kingsbury, Miner, Lake, McCook, Minnehaha, Turner, and Lincoln Counties, South Dakota

Dear Ms. Olson,

On behalf of Dakota Access, LLC, we are submitting the draft report referenced above. The survey was conducted in coordination with the state Public Utilities Commission requirements in compliance with SD 1-19A-11.1. Dakota Access, LLC is independently coordinating with federal agencies for Section 106 requirements for those portions of the Project that traverse federally-managed easements or jurisdictional areas.

A copy of the report has also been submitted to the Jim Haug at the Archaeological Research Center. If you have any questions feel free to contact me at 317-541-8200. Should you wish to defer your review at this time, please notify me.

Sincerely,

Beth McCord
Indiana Branch Manager

cc: Monica Howard, Energy Transfer, Monica.Howard@energytransfer.com
Abby Peyton, Perennial Environmental, APeyton@Pernnialenv.com

South Dakota LRs

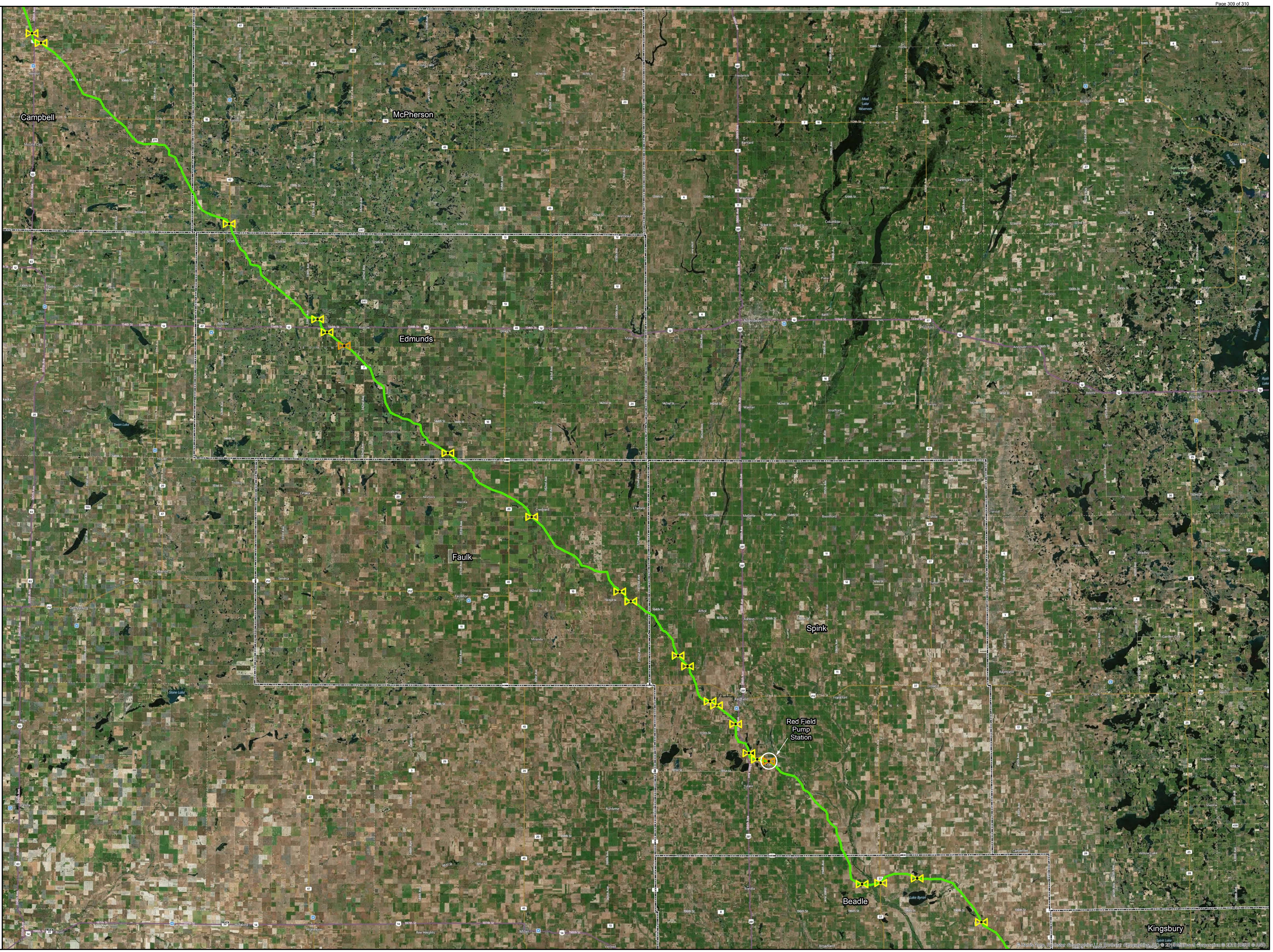
South Dakota MLVs

Route

Counties

MLV/L-R/ PUMP SITE LOCATIONS

0 2.5 5 10 Miles



DAKOTA ACCESS, LLC

South Dakota LRs

South Dakota MLVs

Route

Counties

MLV/L-R/ PUMP SITE LOCATIONS

0 2.5 5 10 Miles

DAKOTA ACCESS, LLC