

Sacagawea 16-inch Pipeline Project As-Built Inspection Report PU-15-114



Prepared for:
**North Dakota Public Service
Commission**

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1.0 Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete an as-built inspection of the Sacagawea Pipeline (Project) in McKenzie and Mountrail Counties, North Dakota (ND), constructed by Sacagawea Pipeline Company, L.L.C. (Sacagawea). Wenck reviewed Project documents to identify those aspects that required compliance, and visually inspected the Project area on September 26, 2018.

The Project was well-maintained and appeared to have been constructed as planned with efforts to minimize impacts. A few issues need to be resolved for the Project to be considered complete and in full compliance, including 1) obtaining the correct as-built drawings and GIS files, 2) vegetation establishment throughout the project area and 3) Tree and Shrub survival reports. See Section 4.0 for further detail. Wenck recommends the PSC take the following steps to resolve these issues.

Recommended Action Steps

→ Request Now

- Correct as-built drawings and GIS files.
- Tree and Shrub Planting and/or Survival Report, from county NRCS office via Sacagawea.

→ Expect Later

- Revegetation Inspection Report (to be completed in 2019 by PSC contractor).
- Annual Tree and Shrub Survival Reports.

2.0 Background and Scope

2.1 INTRODUCTION

The Sacagawea 16-inch Crude Oil Pipeline (Project) is located in McKenzie and Mountrail Counties, North Dakota. The project originates at Paradigm Midstream Service's Keene terminal in McKenzie County and terminates at the Phillips 66 Partners Palermo Rail Terminal Facility in Mountrail County. The Sacagawea Pipeline Company, LLC (Sacagawea) is a joint business venture between Paradigm Pipeline, LLC (Paradigm) and Grey Wolf Midstream, LLC (Grey Wolf). The Project includes a 16-inch diameter underground crude oil pipeline with a total length of approximately 70 miles. The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-15-114 on 5 January 2016, granting a Certificate of Corridor Compatibility No. 177 and Route Permit No. 189 for the Project, amended 1 July 2016.

2.2 PURPOSE

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Post-construction inspections ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable Commission Findings of Fact, Conclusions of Law, and Order (Order). The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete an as-built, post-construction inspection of the Project.

2.3 METHODS AND SCOPE OF INSPECTION

2.3.1 Project Compliance Identification

Wenck identified a list of "Project Specifications", which Sacagawea is obligated or responsible to follow and that can be verified either in written documentation or by an on-site inspection. These items were taken from 1) siting laws and rules, 2) Project activities or specifications proposed in the Consolidated Application for a Certificate of Corridor Compatibility and Route Permit (Application) and Amendment of Application for Route Permit (Amendment), 3) Project plans described in the Findings of Fact, Conclusions of Law, and Order and the Findings of Fact, Conclusions of Law, and Order on Amended Corridor and Amended Route 4) Certification Relating to Order Provisions, and 5) regulations or recommendations from other agencies. These Project specifications are listed in Table 2.1 under 7 categories: Siting & Location; Project Design & Engineering; Pre-Construction; Cultural Resources; Natural Resources; Construction, Reclamation & Soils; and Operation.

2.3.2 Document Review

Wenck staff reviewed publicly-available Project documents in the PSC Online Case Search (ND PSC 2018) to find written verification of compliance for the Project specifications listed in Table 2.1. If written verification was filed, the findings are described in Section 3 and the source and name of the documentation is listed in Table 2.1, Column 3 (Written

Verification). Green shaded boxes in the table represent Project specifications that are potentially non-compliant because they have no written verification.

2.3.3 On-Site Inspection

Sara Simmers, Wenck environmental scientist, inspected the Project route on 26 September 2018. A representative from Sacagawea, Mark Weiler, accompanied Wenck staff during the site visit.

The site was inspected by driving to access points and visually inspecting the route within the Project area from those points. Geographic coordinates were recorded at observation points and potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Appendix A, Figures 1-2**). Digital photographs (Canon Power Shot SD1300 IS, 12 megapixels) were taken showing representative portions of the route, aboveground Project infrastructure, and problem areas (**Appendix B**).

If on-site inspection of a Project specification was completed, the findings are described in Section 3 and referenced in Table 2.1, Column 4 (Site Verification). Green shaded boxes in the table represent Project specifications that are potentially non-compliant based on site verification.

Table 2-1: Project Specifications with Written or Site Verification

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|---|--|----------------------|
| SITING & LOCATION | | | |
| <p>Corr. App. p. 1; Route App. p. 1; Amend. p. 1, 3; Findings of Fact 2, 3, 4</p> | <p>Located in McKenzie and Mountrail Counties, Sacagawea Pipeline Project is a joint business venture between Paradigm Pipeline, LLC and Grey Wolf Midstream, LLC. The project consists of 70 miles of 16-inch steel pipeline and associated facilities. The project originates at Paradigm Midstream Service's Keene terminal and terminates at the Phillips 66 Partners Palermo Rail Terminal. An amended route permit identified 29 route modifications within the original one-mile corridor.</p> | <p>Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit</p> | <p>Section 3.1.1</p> |
| <p>ND Admin. Code Article 69-06-08; Corr. App. p. 15-25; Route App. p. 15-24; Amend. p. 17-20; Findings of Fact 22-37</p> | <p>Siting Criteria analysis – exclusion, avoidance, selection, and policy. Exclusion areas within the corridor study area and route survey area include (exceptions noted in parentheses): federal historic sites or landmarks; state archeological sites; areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility (none within route survey area); and areas within 30 feet on either side of a direct line between ICBM launch or launch control facilities. Avoidance areas include (exceptions noted in parentheses): federal grasslands (within survey area, but avoided by ROW); state game management areas (none within route survey area); areas of known geologic instability; areas within 500-feet of a residence, school, or place of business. The Project avoids or mitigates selection criteria and meets policy criteria.</p> | <p>Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit</p> | <p>Section 3.1.2</p> |
| <p>Findings of Fact 21, 26</p> | <p>The Project crosses ICBM Exclusion Areas at three locations. Sacagawea has received confirmation from the USAF that the planned pipeline bore depth will provide a buffer zone sufficient to protect the integrity of this Exclusion Area.</p> | <p>Docket 1, Consolidated Application, Appendix C: Consultation; Docket 58, Info Re ICBM Locations; Docket 63, E-mail Correspondence with USAF</p> | <p>Section 3.1.3</p> |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|--|--|--|-------------------|
| Route App. p. 30; Findings of Fact 34 | Seven areas of geologic instability are present within the Survey Area, of which two areas will be crossed by the route. The pipeline route is constrained in its available path as it traverses the base of Saddle Butte by numerous existing well pads and by North Dakota Surface Trust land west of Saddle Butte. Due to these geographical route constraints, the Commission finds there is no reasonable alternative to the proposed route crossing these Avoidance Areas. | Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan; Appendix I: USACE Section 10 Permit, Attachment 1: Geotechnical Investigations | Section 3.1.4 |
| Corr. App p. 20; Route App. p. 19; Amend. p. 18; Findings of Fact 32 | A total of 11 potentially occupied structures are located within 500 feet of the Route. Route modifications increased the total to 22 potentially occupied structures. | Docket 1, Consolidated Application, Appendix G: Landowner Waivers; Docket 15, Amendment for Route Permit, Appendix G: Landowner Waivers; Docket 58, Residential Waiver from Tribe; Docket 61, Landowner Waiver | Section 3.1.5 |
| Corr. App. p. 20; Route App. p. 20; Amend. p. 18 | Construction of the Project would temporarily affect approximately 842 acres of private land in North Dakota. Of the 842 acres, approximately 419 acres are located on privately owned cropland. Once construction is complete, the land would be restored to its pre-construction contours and land use. Sacagawea would provide settlements to landowners for crop loss resulting from Project construction. | Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit | Section 3.1.6 |
| Findings of Fact 18 | According to Project maps, the route crosses state trust surface and state mineral ownership, but no state parks or NDPR-managed lands. | Docket 1, Consolidated Application, Appendix C: Consultation | Section 3.1.7 |
| Findings of Fact 5, 6 | The Project crosses both fee and tribal lands located within the boundary of the Fort Berthold Indian Reservation (FBIR). The Three Affiliated Tribes (TAT) of the FBIR, has consented to an easement for that portion of the Project which crosses tribal land within the Reservation. | Docket 1, Consolidated Application, Appendix H: NEPA (BIA/USACE); Docket 56, Late-filed Exhibit 15: Memo regarding PSC jurisdiction on tribal lands | Section 3.1.8 |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|--|---|--|-------------------|
| | PROJECT DESIGN & ENGINEERING | | |
| Corr. App. p. 2-3; Route App. p. 2-3; Findings of Fact 3, 7, 8 | Authorized 70 miles of 16-inch steel pipeline. The maximum capacity will be 200,000 barrels per day. The normal capacity will be 140,000 barrels per day. The normal operating pressure of the pipeline will be 1,200 psi with the maximum operating pressure of the pipeline at 1,440 psi. Above-ground facilities and appurtenances include 9 mainline block valves, 2 mainline check valves, one launcher, one receiver, a leak detection meter, and a custody transfer meter. At the recommendation of the Commission an additional block valve east of Lake Sakakawea was to be installed. | Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit; Docket 57, Late-Filed Exhibit 16: Affidavit of Troy Andrews | Section 3.2.1 |
| Route App. p. 3 | The Pipeline would be constructed utilizing a 100-foot construction right-of-way (ROW). Sacagawea would maintain a typical 50-foot permanent ROW along the entire length of the pipeline. | Docket #1, Consolidated Application | Section 3.2.2 |
| Certification of Order Provision 30 | Provide engineering design drawings prior to construction upon request. | Docket #1, Consolidated Application, Appendix A: Engineering Documents | N/A |
| Certification of Order Provision 32 | Provide electronic and paper copy, and GIS data, of the corridor approved by the Commission and the facility design specifications for the construction of the transmission facility showing the location of the transmission facility as built within 3 months after completion of construction. | Docket 119, As-Built Drawings | N/A |
| | PRE-CONSTRUCTION | | |
| ND Century Code Ch. 49-22-07.1; ND Admin. Code Article 69-06-03 | Letter of Intent. | Docket 2, Application for Waiver or Reduction of Procedures and Time Schedules | N/A |
| ND Century Code Ch. 49-22-08; ND Admin. Code Article 69-06-04 | Application for a Certificate of Site or Corridor Compatibility and Route Permit. | Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit | N/A |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|---|---|-------------------|
| ND Century Code Ch. 49-22-07 | Certificate of Site Compatibility or Route Permit. | Docket 66, Findings of Fact, Conclusions of Law and Order; Docket 100, Amendments | N/A |
| ND Century Code Ch. 49-22-04; ND Admin. Code Article 69-06-02 | Ten-year Plan. | Docket 7, Updated Ten Year Plan | N/A |
| Certification Order Provisions 2, 5, 28, 29 | Hold a pre-construction conference. Provide notice of intent to start construction. Provide name and phone number of company representative to each landowner with easement agreement. | Docket 72, Preconstruction call minutes and landowner contact info | N/A |
| Certification of Order Provisions 31, 36-42 | Inform Commission in writing of plans to modify facility or site plan for the facility. Use the procedures pursuant under NDCC 49-22-16.3 to seek a route adjustment before or during construction of the pipeline. | Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3 | N/A |
| Certification of Order Provisions 3, 4 | Compliance with rules and regulations of other jurisdictional agencies. Obtain other necessary licenses and permits and provide copies prior to applicable permitted activity. | See Section 3.3.4 | N/A |
| Certification of Order Provisions 34, 35, 42 | Participate in ND One-Call Excavation Notice System. | N/A | Section 3.3.5 |
| CULTURAL RESOURCES | | | |
| Route App. p. 9-10, 26-29; Amend. p. 14; Certification Order | Complete Class III cultural resources survey of corridor and submit to NDSHPO for review and concurrence. Submit cultural resource mitigation plans to SHPO prior to | Docket 1, Consolidated Application, Appendix E: Cultural Resources Report | Section 3.4.1 |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|---|--|-------------------|
| Provision 12 | construction for approval. Sacagawea has committed to protecting the integrity of cultural resources by either avoiding them by at least 50 feet, by placing temporary fencing around the sites and providing an archaeological monitor during ground-disturbing activities near the site, or horizontal directional drilling beneath the site at a depth of 50 feet or greater. Sacagawea testified that the Tribal Historic Preservation Office was consulted concerning cultural resources for that portion of the Project which crosses tribal lands. | Abstracts; Docket 15, Amendment for Route Permit, Appendix E: Cultural Resources Report Abstracts | |
| Certification Order Provision 12 | Report discovery of cultural, archeological, historic, etc. sites and stop construction, consult SHPO and PSC for clearance, and file report to PSC. | Docket 88, Emails regarding discovery of bones in subsoil; Docket 91, Email regarding discovery of bones and stone flake in pipeline trench | N/A |
| NATURAL RESOURCES | | | |
| Route App. p. 7, 14, 26-27; Findings of Fact 27, 51 | The Survey Corridor was inventoried for sensitive species and their critical habitat. Piping plovers were observed during field surveys and nesting behavior was noted. No other threatened or endangered species or their critical habitats were observed by field biologists. Provided the mitigation plans are fully implemented and environmental permit conditions are executed, the Project would not result in any impact to listed or sensitive species or their habitats. | Docket 1, Consolidated Application, Appendix C: Consultation and Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report | Section 3.5.1 |
| Route App. p. 26 | Migratory Bird Treaty Act: Construction activities may occur during the recognized migration/breeding season for migratory birds (February 15 - July 15). Sacagawea would develop and implement a mitigation plan which may include conducting surveys for nesting birds prior to commencement of ground disturbing activities and implementing avoidance and monitoring measures of active nests. | Docket 1, Consolidated Application, Appendix C: Consultation and Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report | Section 3.5.2 |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|--|---|----------------------|
| | <p>Bald and Golden Eagle Protection Act: Field surveys confirmed the absence of nests or nesting activities where habitat was suitable along the Route. To mitigate potential adverse effects on nesting and breeding eagles, the USFWS generally recommends maintaining a nest buffer of at least 0.5 miles for any eagles nesting in the area. Sacagawea would work with the USFWS as necessary if an eagle nest is identified within 0.5 miles of the proposed pipeline route.</p> | | |
| <p>Route App. p. 7, 26; Findings of Fact 37, 50</p> | <p>Sacagawea would minimize impacts to wetland and waterbodies by minimizing workspace through these features and by utilizing low-impact crossing methods such as horizontal directional drilling where appropriate. Sacagawea would conduct all regulated crossings in compliance with the Corps Nationwide Permit #12.</p> <p>Sacagawea has committed to protecting the integrity of wetlands and waterbodies crossed by the route by using best management practices to minimize erosion and to prevent sediment discharge, which will include minimizing the footprint of environmental disturbance, installing sediment barriers, trench plugs, and temporary slope breakers as necessary, and properly restoring topsoil.</p> | <p>Docket 1, Consolidated Application, Appendix C: Consultation and Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report</p> | <p>Section 3.5.3</p> |
| <p>Certification Order Provision 10</p> | <p>Report presence of threatened or endangered species, bald or golden eagles of which Company becomes aware and which were not previously reported to the Commission.</p> | <p>Dockets 77, 89, 104, 109, 113, 114, 120, 121: Monthly Construction Reports</p> | <p>N/A</p> |
| <p>Certification Order Provision 17</p> | <p>Reclamation, fertilization, and reseeding is to be done according to the NRCS recommendations and NDSU publications, unless otherwise specified by the landowner and approved by the Commission.</p> | <p>Seed tag provided by Sacagawea</p> | <p>Section 3.5.5</p> |
| <p>Route App. p. 7, 25; Certification of Order Provision 20</p> | <p>Tree and shrub removal and replacement will comply with "Tree and Shrub Mitigation Specifications".</p> | <p>Docket 115, Tree and Shrub Mitigation Plan</p> | <p>Section 3.5.6</p> |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|--|---|-------------------|
| Route App. p. 6, 30 | Sacagawea committed to implementation of best practices to prevent or minimize the spread of noxious weeds. | N/A | Section 3.5.7 |
| | CONSTRUCTION, RECLAMATION & SOILS | | |
| Route App p. 24; Certification of Order Provisions 5, 15, 34; Findings of Fact 49 | Provide monthly construction reports. Construction must be suspended when weather conditions are such that construction activities will cause irreparable damage to roads or land. Sacagawea will have environmental inspectors with stop-work authority on each construction spread. In the event of any damage to underground facilities, Company shall notify the Commission and suspend construction in the vicinity of the damage until compliance with One-Call Excavation Notice System requirements under North Dakota Century Code Chapter 49-23 has been determined. | Dockets 77, 89, 104, 109, 113, 114, 120, 121: Monthly Construction Reports | Section 3.6.1 |
| Route App. p. 24; Certification of Order Provision 23 | Sacagawea would monitor landowner and community concerns through its right-of-way (ROW) department and would respond to all reasonable requests. Staging areas or equipment shall not be located on land owned by a person other than Company unless otherwise negotiated with landowners. | N/A | Section 3.6.2 |
| Certification of Order Provision 16 | All topsoil, up to 12 inches, or topsoil to the depth of cultivation, whichever is greater, over and along trench areas where cuts will be made, must be stripped and segregated from the subsoil. Any area on which excavated subsoil will be placed must also be stripped of topsoil. After backfilling is completed, any excess subsoil must be placed over the excavation area, blending the grade into existing topography. Topsoil must be replaced over areas from which it was stripped only after the subsoil is replaced. | Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report | Section 3.6.3 |
| Certification Order Provision 6, 13 | Pipeline buried to a minimum depth from the ground surface to the top of the pipe of 48 inches in range land, 48 inches for cultivated land, 48 inches at the bottom of the ditch for road crossings, and 72 inches across undeveloped | Docket 112, Construction Inspection Report | Section 3.6.4 |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|---|---|-------------------|
| | section lines. Buried facility crossings of graded roads must be bored unless the responsible governing agency specifically permits Company to open cut the road. | | |
| Route App. p. 21 | Care would be taken throughout the construction process to minimize environmental impacts, including modification of drainage patterns. BMPs would be implemented in accordance with the project-specific Stormwater Pollution Prevention Plan (SWPPP), which would comply with the NDDoH Construction Stormwater General Permit requirements. | N/A | Section 3.6.5 |
| Route App. p. 21; Certification of Order Provisions 13, 14, 25; Findings of Fact 48 | During restoration, areas disturbed during construction would be restored, the local topography would be restored to its original contours, vegetation would be reestablished, and impacts would be minimal and temporary. Restoration of area to pre-construction contours as soon as practicable upon completion of construction. Temporarily disturbed areas and roads will be restored. Pre-existing roads restored to equal or better condition. | N/A | Section 3.6.6 |
| Certification of Order Provisions 21, 22, 24 | Repair/replace all damaged fences and gates. Repair/replace damaged drainage tile. Waste removed and disposed regularly. | N/A | Section 3.6.7 |
| Findings of Fact 43-46 | Sacagawea committed to boring under Lake Sakakawea by an experienced contractor, using drilling fluid of only fresh water and bentonite, buried at least 100 feet below the bed of Lake Sakakawea. | Docket 1, Consolidated Application, Appendix I: United States Army Corps of Engineers NWP #12 PCN Section 10 Permit | Section 3.6.8 |
| | OPERATION | | |
| Certification of Order Provision 8, 27 | Maintain records of compliance with Order and Certificate of Site Compatibility. Extraordinary events (e.g., injuries, T+E wildlife fatalities) reported within 5 business days. | None reported to date. | Section 3.7.1 |
| Certification of Order Provisions 18, 19 | Obligation for reclamation and maintenance of the facilities, right-of-way, and roadways will continue throughout the life of the transmission facility. | None | Section 3.7.2 |

| Source of Project Specification | Description of Project Specification | Written Verification | Site Verification |
|---|---|--|-------------------|
| Route App. p. 20; Certification of Order Provision 26 | Provide safety measures for traffic control or to restrict public access to the transmission facility. Sacagawea committed to working with local landowners and county officials to ensure pipeline markers are located where required but also in an acceptable location for these parties. | None | Section 3.7.3 |
| Findings of Fact 38-41 | Sacagawea committed that a supervisory control and data acquisition system (SCADA) and that back-up systems for both power and communications will be installed as part of the Project, and operations will be continuously monitored by a control center located in Bartlesville, Oklahoma. Sacagawea committed to provide emergency spill response, that trained emergency response personnel will be stationed at the Palermo terminal, and that trailers containing emergency spill response equipment will be stationed at both the Keene and Palermo terminals. | Dockets 53-55, Late-filed Exhibit 12: Spill Histories; Late-filed Exhibit 13: Leak monitoring information / spill response scenarios including draft spill response plan; Late-filed Exhibit 14: Pigging Information | Section 3.7.4 |

***Note: Green shaded boxes represent potential non-compliance issues.**

3.0 Findings

3.1 SITING & LOCATION OF FACILITY

3.1.1 Designated Location & Maps of Corridor

The Project was built as proposed in the designated location described in the Application, Amendment, and Order in McKenzie and Mountrail Counties, North Dakota. Sacagawea constructed the project entirely within the approved corridor and according to the approved route alignments (**Appendix A, Figures 1-2**).

3.1.2 Siting Criteria

Siting criteria (exclusion, avoidance, selection, and policy criteria) were analyzed in detail in the Application (Docket 1, Consolidated Application) and Amended Application (Docket 15, Amendment for Route Permit) for the Project.

The corridor study area or route survey area included the following exclusion areas: federal historic sites or landmarks; state archeological sites; areas within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility (none within route survey area); and areas within 30 feet on either side of a direct line between ICBM launch or launch control facilities. Avoidance and mitigation to historic and cultural exclusion areas are discussed in Section 3.4, Cultural Resources. Avoidance and mitigation to ICBM launch or launch control facilities are discussed in Section 3.1.3, ICBM Facilities.

The corridor study area or route survey area included the following avoidance areas: federal grasslands (within survey area, but avoided by ROW); state game management areas (none within route survey area); areas of known geologic instability; and areas within 500-feet of a residence, school, or place of business. The Little Missouri National Grasslands (federal grasslands) are present within the corridor survey area, but are not crossed by the route. The state Van Hook and Palermo Wildlife Management Areas are present within the corridor survey area, but are not crossed by the route. Wenck verified during the site inspection that federal grasslands and state game areas were avoided by the route. Avoidance and mitigation to areas of geologic instability are discussed in Section 3.1.4, Areas of Geologic Instability. Avoidance and mitigation to areas within 500-feet of a residence, school, or place of business are discussed in Section 3.1.5, Occupied Structures. Wenck confirmed that impacts to selection and policy criteria were considered and kept at a minimum.

3.1.3 ICBM Facilities

The corridor study area (but not the route survey area) is within 1,200 feet of a geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility and the Project route is within 30 feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities at three locations. In a response dated November 30, 2015, the U.S. Air Force indicated that the Project will not interfere with Air Force communications systems within their ICBM launch complex area and will be located at least 1,200 feet from ICBM launch facilities. The USAF recommended that at locations where the route will intersect buried USAF facilities, the Project must be installed by means of horizontal directional drilling under USAF cables in order to maintain a minimum separation distance of three feet (Docket 63, E-mail Correspondence with the US Air Force). Additional correspondence with the U.S. Air Force was included in Docket 1, Consolidated Application, Appendix C: Consultation and Docket 58, Info Re ICBM Locations. It appeared during the site visit that the pipeline had been installed within the approved route alignment.

3.1.4 Areas of Geologic Instability

The corridor study area and route survey area included seven areas of geologic instability, of which two areas will be crossed by the route. Sacagawea testified that these two areas, which are composed of a mixture of strata and deposits that have slid to the base of Saddle Butte, will be crossed utilizing practices to minimize impacts as identified in Hearing Exhibit 1 (Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan) and will be monitored until site stabilization is achieved. The pipeline followed rolling topography across rangeland and hayland at the base of Saddle Butte, next to the gravel road 108th Ave NW (**Observation Point 634, Photos 32-35**). The contouring matched the adjacent landscape and the route had been re-seeded. There was high cover of annual weeds and soils on the hilltops were gravelly and lighter in color. Topsoil was naturally shallow in this area and the soils in the hayland portion had been mixed to the depth of cultivation prior to installation of the pipeline. It appeared reclamation had been done satisfactorily, though some follow-up work may be required in this location to reseed or amend the soil.

Four shallow areas of geologic instability present on banks of Lake Sakakawea will be avoided by boring, as discussed in Attachment 1: "Geotechnical Investigations", of Appendix I (Docket 1, Consolidated Application, Appendix I: USACE Section 10 Permit, Attachment 1: Geotechnical Investigations). The banks of Lake Sakakawea had been avoided by boring, with boring locations set back several hundred feet from the banks (**Figures 1 and 2; Observation Point 628, Photo 28**).

3.1.5 Occupied Structures

The Project was in a rural setting. Areas within 500 feet of an inhabited rural residence must be designated avoidance areas. Sacagawea testified that there are eleven inhabited rural residences within 500 feet of the proposed route, which involves a total of seven property owners. Route modifications increased the total to 22 potentially occupied structures (Docket 15, Amendment for Route Permit), though it was not clear how many of these were determined to be occupied. Sacagawea obtained waivers from property owners and has filed copies of the waivers (Docket 1, Consolidated Application, Appendix G: Landowner Waivers; Docket 58, Residential Waiver from Tribe; Docket 61, Landowner Waiver). Several residences and/or farmyards were noted in the vicinity of the route during the site inspection; waivers had been obtained.

3.1.6 Land & Agricultural Impacts

The Project was built as proposed within the estimated construction ROW. The land use of properties crossed by the Project was primarily cropland or rangeland. Approximately 842 acres of private land was affected, of which 419 acres was privately owned cropland (Docket 1, Consolidated Application; Docket 15, Amendment for Route Permit). Sacagawea negotiated easements with affected landowners and would not be expected to have permanent impacts to farm/ranch operations. At the time of the inspection, the land had been restored to its pre-construction contours. Generally, areas impacted by pipeline construction (except aboveground facilities) were returned to previous land use, including cropland (**Photos 6, 8-11, 22, 24, 25-31, 36**), hayland/CRP (**Photos 3, 5, 7, 14, 17, 18, 23, 34, 38**), and rangeland (**Photos 2, 15, 16, 19, 20, 33, 37**). The condition of most areas of hayland or cropland looked comparable within and outside of the ROW, though other areas may take several years to reach the same level of productivity. Seeded grasses were coming in on areas of rangeland, though some parcels the seeded grass cover was sparse and may need to be overseeded.

3.1.7 ND State-Owned or Managed Lands

According to Findings of Fact 18, the ND Department of Trust Lands (NDDTL) Surface Management Division indicated that no school trust lands exist within the Study Area in a response dated 18 December 2014; however this correspondence was regarding the Palermo segment of the Project (Docket 1, Consolidated Application, Appendix C: Consultation). A response regarding the Sacagawea segment of the Project was pending at the time of the Consolidated Application and no further records from the Surface Management Division were filed.

The NDDTL Minerals Management Division responded November 6, 2014 and March 6, 2015 confirming the presence of State Mineral Trust Land tracts within the Project Corridor as depicted in the consultation map (Docket 1, Consolidated Application, Appendix C: Consultation).

The ND Parks & Recreation Department (NDPR) responded 14 November 2014 confirming the Sakakawea segment of the Project as defined would not impact state park lands or Land and Water Conservation Fund recreation projects and there have been documented occurrences of species or ecological communities of concern within the Corridor (Docket 1, Consolidated Application, Appendix C: Consultation). A response regarding the Palermo segment of the Project was pending at the time of the Consolidated Application and no further records from the NDPR were filed.

The ND Game & Fish Department (NDGFD) responded 12 November 2014 and 15 January 2015 that if the Van Hook or Palermo Wildlife Management Areas are impacted by construction activities, a special use permit may be required (Docket 1, Consolidated Application, Appendix C: Consultation; Docket 62, NDGFD Comments and Recommendations).

According to Project maps, the route crosses state trust surface lands. These areas were viewed during the as-built inspection and were used for rangeland. Planted grasses and annual weeds were the dominant species. No noxious weeds were observed on the ROW in these areas. More time is needed for the plantings to establish (**Photo 19, Observation Point 619**).

3.1.8 FBIR Lands

The Project crosses both fee and tribal lands located within the boundary of the Fort Berthold Indian Reservation (FBIR). The Three Affiliated Tribes (TAT) of the FBIR, has consented to an easement for that portion of the Project which crosses tribal land within the Reservation. The portion of the Project on tribal lands also underwent environmental review through the National Environmental Policy Act (NEPA) under the Bureau of Indian Affairs (BIA) (Docket 1, Consolidated Application, Appendix H: NEPA (BIA/USACE)). While the PSC proceeded with issuance of a route permit across tribal lands, the PSC does not have jurisdiction on tribal lands (Docket 56, Late-filed Exhibit 15, Memo regarding PSC jurisdiction on tribal lands); therefore, the as-built inspection did not include tribal-owned tracts on the route (**Figures 1 and 2**).

3.2 PROJECT DESIGN & ENGINEERING

3.2.1 Length & Infrastructure

The Project was authorized as 70 miles of 16-in diameter underground pipeline and associated valves, launcher/receiver, and meters, as described in the Application, Amended Application, and at the notice of opportunity for hearing (Docket 1, Consolidated

Application; Docket 15, Amendment for Route Permit; Docket 57, Late-Filed Exhibit 16, "Affidavit of Troy Andrews"). The site inspection observations coincide with these parameters. The block valve east of Lake Sakakawea was observed (**Photo 28**).

3.2.2 Right-of-Way Corridor

The Consolidated Application described that Sacagawea would construct the pipeline within a temporary 100-ft ROW and would maintain a typical 50-foot permanent ROW along the entire length of the pipeline, except as restricted by environmental conditions, foreign lines, and landowner agreements (Docket #1, Consolidated Application). The pipeline appeared to have been constructed and maintained within these maximum widths (**Appendix A and B**).

3.2.3 Engineering Design Drawings

There was no documentation of a request from the PSC for the company to provide design drawings prior to construction. However, engineering design drawings were provided in the Application materials (Docket #1, Consolidated Application, Appendix A: Engineering Documents).

3.2.4 As-built Drawings and GIS Files

As-built alignment drawings were submitted to the PSC 23 March 2017, along with confidential GIS information (Docket 119, As-Built Drawings). However, the as-built drawings in the Docket are for Sacagawea's Johnson's Corner Pipeline, PU-15-744. Wenck recommends the PSC determine if the correct drawing were mis-filed and if not, to request the correct as-builts and GIS data from Sacagawea.

3.3 PRE-CONSTRUCTION

3.3.1 PSC-Required Documents

A letter of intent was not filed for the case. An Application for Waiver or Reduction of Procedures and Time Schedules was filed 16 March 2015 (Docket 2). A Consolidated Application for a Certificate of Site or Corridor Compatibility and Route Permit was filed 16 March 2015 (Docket 1), and an Amendment of Application for Route Permit was filed 29 June 2015 (Docket 15). A Certificate of Corridor Compatibility No. 177 and Route Permit No. 189 were issued on 5 January 2016 (Docket 66, Findings of Fact, Conclusions of Law, and Order), with the Order and Certification Relating to Order Provisions (Docket 34). The Certificate and Permit were amended 1 July 2016 (Docket 100, Findings of Fact, Conclusions of Law, and Order on Amended Corridor and Amended Route). A Ten-Year Plan was filed under this case (Docket 7, Updated Ten Year Plan) and under case number PU-15-188 (Docket 1, 2015 Ten Year Plan).

3.3.2 Pre-Construction Conference/Notice of Intent to Start Construction

A pre-construction conference call was held on 22 January 2016. Meeting minutes were taken, as well as a list of attendees (Docket 72, Preconstruction call minutes and landowner contact info). The timeframe of the start of construction was discussed during the pre-construction call. A separate notice of intent to start construction was not filed. Contact information for a company representative was provided during the meeting to be provided to landowners.

3.3.3 PSC Approval of Modifications

Sacagawea filed requests for pipeline route modifications notifications of project route adjustments 18 May 2016, 27 May 2016, 15 June 2016, 21 June 2016, and 24 August 2016 (Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110,

Certification and documentation for route adjustments under NDCC 49-22-16.3). The Commission acknowledged that they received Sacagawea's filings (Dockets 92, 96, 111, Letters acknowledging certification and documentation for route adjustments).

3.3.4 Permits and Approvals from Other Agencies

It was indicated in the Application and Amendment that consultation with federal, state, and local agencies would be required to obtain permits for the Project. Agencies consulted with and permits identified as required for the Project included (Docket 1, Consolidated Application; Docket 42, Exhibit 4, Permits and Approvals Table):

- U.S. Army Corps of Engineers (Corps): Jurisdictional Waters, Sect. 10 Permit, NEPA
- Bureau of Indian Affairs (BIA): NEPA Environmental Assessment
- U.S. Fish and Wildlife Service (USFWS): Biological Assessment Concurrence
- Environmental Protection Agency (EPA): NPDES Stormwater and Dewatering Permits
- U.S. Air Force (USAF) Cable Affairs
- ND Department of Health (NDDH), Water Quality Division: NPDES Stormwater and Dewatering Permits
- ND Dakota State Historical Preservation Office (SHPO): Section 106 Review, Concurrence
- ND State Water Commission (NDSWC): Sovereign Lands Permit
- ND Department of Transportation (NDDOT): State Highway Crossing Permit
- North Dakota Game and Fish Department (NDGFD)
- North Dakota Parks and Recreation-Natural Heritage Program (NDPRD)
- North Dakota Department of Trust Lands (NDDTL) – School Trust, Mineral Trust
- McKenzie County Building and Planning Department: Conditional Use, County Road/Sectionline Crossing
- Dunn County Planning and Zoning: County Road/Sectionline Crossing
- Canadian Pacific Railroad: Railroad Bore

Records of correspondence with the agencies and associated permits were filed with the PSC as required (Docket 1, Consolidated Application, Appendix C: Consultations, Appendix H: NEPA (BIA/USACE), Appendix I: United States Army Corps of Engineers NWP #12 PCN Section 10 Permit, Appendix J: North Dakota State Water Commission Sovereign Lands Permit; Docket 43, Exhibit 5, USFWS Concurrence; Docket 44, Exhibit 6, Conditional Use Permit from McKenzie County; Docket 45, Exhibit 7, McKenzie County – Road Crossing Permit; Docket 46, Exhibit 8, Mountrail County – Road Crossing Permit, Docket 48, Exhibit 10, SHPO Letters; Docket 49, Exhibit 11, ND Department of Health letter to PSC; Docket 58, Info Re ICBM Locations; Docket 62, NDGFD Comments and Recommendations; Docket 63, E-mail Correspondence with the US Air Force; Docket 90, NDDH Comments).

3.3.5 North Dakota One-Call Participation

Sacagawea certified that they would participate in North Dakota One-Call utility locates. Previous topsoil and construction inspections did not indicate whether or not pin flags were observed which would indicate buried utilities had been marked (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report). The Construction Inspection Report indicated that there had been a rural water line break caused during boring of the the pipeline across a gravel road on the Van Hook peninsula (Docket 112, Construction Inspection Report, Photos 13-15, GPS Point #444) (**Figure 2, Page 5**). Other than this report, there were no other notices of this incident filed with the PSC. It is not clear whether the water line had been marked through ND One-Call prior to the incident.

3.4 CULTURAL RESOURCES

3.4.1 Cultural Site Avoidance

Class I Literature Reviews and Class III Cultural Resource Inventories were completed for the original proposed route and amendments or modifications to the route (Docket 1, Consolidated Application, Appendix E: Cultural Resources Report Abstracts; Docket 15, Amendment for Route Permit, Appendix E: Cultural Resources Report Abstracts; Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3).

Sacagawea received concurrence of “No Significant Sites Affected” from the NDSHPO for the proposed route and re-routes, provided recommendations concerning avoidance of cultural resources are followed and provided there are no changes to the nature or location of the proposed Project on 4 February 2015, 17 February 2015, 22 May 2015, 5 June 2015, 18 April 2016 (Docket 1, Consolidated Application, Appendix C: Consultations; Docket 15, Amendment for Route Permit, Appendix C: Consultations; Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3). Previous topsoil and construction inspections did not indicate whether cultural resource sites near the route were marked with temporary fencing or whether other measures were used (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report).

3.4.2 Unanticipated Discoveries

Three unanticipated discoveries of bones and stone flakes were reported during construction (Docket 88, Emails regarding discovery of bones in subsoil; Docket 91, Email regarding discovery of bones and stone flake in pipeline trench). Construction was stopped, and Metcalf Archeology was consulted to determine whether the bones were of human origin. Metcalf gave clearance to proceed.

3.5 NATURAL RESOURCES

3.5.1 Threatened and Endangered Species

Areas critical to the life stages of threatened or endangered animal or plant species are considered to be Exclusion Areas. Lake Sakakawea has been designated by the USFWS as critical habitat for both the interior least tern, an endangered avian species, and the piping plover, a threatened avian species. Sacagawea testified that the Project will be bored underneath Lake Sakakawea and its adjacent uplands for one-half mile on either side of the lake in order to protect the integrity of this Exclusion Area.

To mitigate any adverse effects on migratory whooping cranes, Sacagawea would suspend heavy equipment operations when whooping cranes are found within 0.5 miles (line of sight) of the construction corridor. To mitigate adverse effects on least terns and piping plovers, ground disturbing activities would be constrained from 0.5 miles of the primary habitat (lake and sandbar features). To mitigate adverse effects on pallid sturgeon, ground disturbing activities would be constrained from 0.5 miles of the primary habitat (Lake Sakakawea), and the lake crossing will be bored 100 feet below the water. Sacagawea testified that construction will take place outside of the sensitive breeding season for terns and plovers.

Natural resource reports for the Project are included in Application and Amendment materials (Docket 1, Consolidated Application, Appendix C: Consultation and Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report; Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3). The Biological Assessment associated with the project is contained in Docket 1, Consolidated Application, Appendix H: NEPA (BIA/USACE). Correspondence with the USFWS regarding federally listed species is included in Docket 1, Consolidated Application, Appendix C: Consultation. Concurrence for “may affect, but not likely to adversely affect” determinations for the whooping crane, least tern, piping plover and its critical habitat, and the pallid sturgeon was received 10 August 2015 (Docket 43, Exhibit 5, USFWS Concurrence).

The site inspection confirmed that the pipeline was bored under Lake Sakakawea and that the bore exit and entry locations were at a minimum one-half mile from the shoreline of the Lake (**Photo 28, Observation Point 628; Figure 2, Page 5**). Monthly construction reports did not indicate there were any observations of whooping cranes during construction and no notices were filed to the PSC of stop work orders for whooping cranes (Dockets 77, 89, 104, 109, 113, 114, 120, 121: Monthly Construction Reports). Monthly construction reports were not detailed enough to determine if construction was suspended within one-half mile of the Lake during the breeding season for terns and plovers (April 1– August 31). Construction reports from April to August indicated construction was proceeding on either side of the lake during that timeframe (Dockets 77, 89, 104, 109, 113, 114); however this construction activity would have been outside of the line-of-sight from the shoreline and would have been unlikely to disturb nesting terns or plovers.

3.5.2 MBTA and BGEPA

Natural resource reports, which include eagle nest surveys, for the Project are included in Application and Amendment materials (Docket 1, Consolidated Application, Appendix C: Consultation and Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report; Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3). The Biological Assessment associated with the project is contained in Docket 1, Consolidated Application, Appendix H: NEPA (BIA/USACE). Correspondence with the USFWS and NDGFD regarding migratory birds and bald and golden eagles is included in Docket 1, Consolidated Application, Appendix C: Consultation and Docket 62, NDGFD Comments and Recommendations.

Monthly construction reports from April to July indicated construction was proceeding during the migratory bird breeding season (Dockets 77, 89, 104, 109, 120, 121). Construction reports were not detailed enough to indicate if mowing had taken place or surveys were completed for migratory birds prior to construction. No construction reports or other filings indicated eagle nests were identified during construction. No eagle nests were incidentally observed during the as-built inspection.

3.5.3 Wetlands

Field surveys identified and recorded numerous wetland and stream features within the 100-foot-wide construction ROW, some of which were jurisdictional. Sacagawea committed to implement appropriate construction mitigation measures to minimize impacts or avoid these features, as well as best management practices to minimize erosion and to prevent

sediment discharge (Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan). Sacagawea consulted with the USFWS, Corps, NDDH, and NDGFD regarding wetland avoidance and protection (Docket 1, Consolidated Application, Appendix C: Consultation; Docket 49, Exhibit 11, ND Department of Health letter to PSC; Docket 62, NDGFD Comments and Recommendations; Docket 90, NDDH Comments), and received a Corps Nationwide Permit #12 for impacts to jurisdictional wetlands (Docket 1, Consolidated Application, Appendix I: United States Army Corps of Engineers NWP #12 PCN Section 10 Permit).

Topsoil and construction inspections noted some locations where timber mats and silt fences were in place to protect low areas or wetlands, and noted where some wetlands had been bored underneath for avoidance. The construction inspections noted multiple observations of drainage areas or wetlands without erosion control in place, with erosion control or silt fences inadequately maintained, disturbance directly within or near a wetland (trenching through wetlands is not necessarily prohibited, depending on jurisdiction and permit conditions), soil piles within or near wetland features with no erosion control, timber mats floating in a wetland, and traffic across a wetland that was bored underneath (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report). Refer to case number PU-16-582, "Corridor Certificate 177/Route Permit 189, Compliance" for further information on these observations and reported potential violations, responses by Sacagawea, and resolution of the issues.

During the as-built inspection, it appeared the issues noted in previous reports had been resolved during the reclamation process (**Observation Points 612, 613, 615, 619, 622, 627**). Contouring around and through wetlands (depending on jurisdiction) appeared to have been done appropriately, wetland vegetation appeared to have re-established, and there were no obvious problem areas with erosion or sedimentation as a concern (**Photos 1, 11, 13, 19, 27, 32**). A couple locations on steep slopes had erosion control in place where upland vegetation had not yet established; the erosion control features were in good condition and maintained (**Photo 16**).

3.5.4 Reporting

Monthly construction reports did not indicate there were any observations of threatened or endangered species or eagles during construction and no other notices or reports were filed to the PSC of such observations (Dockets 77, 89, 104, 109, 113, 114, 120, 121: Monthly Construction Reports).

3.5.5 Reclamation & Reseeding

At the time of the site inspection, the pipeline trench had been backfilled, soils had been recontoured, cropland had been planted and harvested for the season, and reseeded had been completed in non-cropland areas (**Appendix B**). According to monthly construction reports, backfilling was complete on all the spreads by September 2016, and clean-up was about halfway complete. Clean-up and re-seeding continued in June and July 2017, with the east side of the Lake complete in June 2017, and the west side of the Lake continuing into July and August 2017. Sacagawea's contact Mr. Stelzer noted via email that a gas line was installed adjacent to the Project in 2017 on the west side of the Lake; reclamation and re-seeding was completed during the 2018 season for the gas line and overlapped part of the disturbance from the Project's crude oil line. A seed tag provided by Mr. Stelzer indicated the following native grass mix on non-cropland areas: 'Rosana' western wheatgrass, 29%; 'Revenue' slender wheatgrass, 16%; 'Lodorm' green needlegrass, 13%; 'Pierre' sideoats grama, 6%; and a cover of 'Leggett' oats, 33%.

In non-cultivated areas (rangeland), seeded grasses had germinated in all areas, but their establishment varied from being well-established with good cover to being sparse at less than 10% cover with annual weeds (**Photos 2, 15, 16, 19, 20, 33, 37**). In some areas the seeded grass cover may need to be overseeded. Of the grasses indicated on the seed tag, all were observed in at least one parcel observed during the inspection. Intermediate wheatgrass and tall wheatgrass were also observed in seeded areas, which would have likely been planted species. The route had been grazed in many of these areas, with the ROW being favored for its new growth. This grazing pressure may delay the establishment of the grasses. Annual weeds were common in some of the parcels, which is expected during the first several years of reclamation.

Cropland (**Photos 6, 8-11, 22, 24, 25-31, 36**) and hayland/CRP (**Photos 3, 5, 7, 14, 17, 18, 23, 34, 38**) had been harvested or hayed at the time of the inspection. The density of stubble or the density of basal hay growth looked comparable or better in most areas between the ROW and adjacent areas, though some observations were noticeably different.

A revegetation inspection contracted by the PSC is planned one year from the last date of seeding to document establishment of vegetation. Since the adjacent gas line was re-seeded in 2018 which overlapped part of the Project ROW, the revegetation inspection is planned for 2019.

3.5.6 Tree & Shrub Mitigation

Field surveys included pre-construction tree and shrub inventories for the original proposed route and subsequent alignment modifications (Docket 1, Consolidated Application, Appendix D: Natural Resources Report; Docket 15, Amendment for Route Permit, Appendix D: Natural Resources Report; Docket 78, Request for Pipeline Route Deviation and Consolidated Application for Amended Certificate of Corridor Compatibility and Amended Route Permit; Dockets 87, 95, 97, 110, Certification and documentation for route adjustments under NDCC 49-22-16.3). It appeared that in general, major woody areas or planted shelterbelts were avoided through Project siting or construction width was necked down (**Photo 16, 22, 23, 25, 26, 32, 33, 36, 38**).

Sacagawea committed to replacement of trees and shrubs according to the PSC "Tree and Shrub Mitigation Specifications," as described in their Reclamation Plan for the Project (Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan). Sacagawea also specifically provided a "Tree/Shrub Mitigation Plan" (Docket 115, Tree and Shrub Mitigation Plan), which was approved by the Commission 30 November 2016. The Project-specific plan describes that the planting of trees and shrubs and three-year survival monitoring will be completed by the county NRCS offices. No annual reports have been submitted to date. It is recommended that the PSC follow up with Sacagawea regarding the status of tree mitigation efforts and to request survival reports.

3.5.7 Noxious Weeds

At least four areas of Canada thistle, a noxious weed, were identified within the Survey Corridor during natural resources surveys. Sacagawea committed to noxious weed mitigation as described in their Reclamation Plan for the Project (Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan). No extensive areas of noxious weeds were observed on-site. One location of Canada thistle (**Photo 15, Observation Point 616**) and one of absinthe wormwood (**Observation Point 621**) was observed which should continue to be treated and monitored, along with other known locations of these weeds along the ROW. There was growth of annual weeds surrounding the valve settings; it appeared these areas had been sprayed during the growing season,

though it would be better if they could be sprayed earlier prior to the plants getting so large and seeding out (**Photo 12, 36**).

3.6 CONSTRUCTION, RECLAMATION & SOILS

3.6.1 Construction Management & Safety

Monthly construction reports were submitted for the duration of construction and reclamation (Dockets 77, 89, 104, 109, 113, 114, 120, 121: Monthly Construction Reports). Reports indicated that construction of the Project proceeded with no incidents, accidents, or injuries. Reports did not indicate whether or not there were any delays in construction due to weather. Environmental inspectors from Keitu Engineers & Consultants, Inc. (Keitu) accompanied Wenck staff during previous inspections, indicating they were on-site during construction (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report). The Construction Inspection Report noted that there had been a rural water line break caused during boring of the the pipeline across a gravel road on the Van Hook peninsula (Docket 112, Construction Inspection Report, Photos 13-15, GPS Point #444) (**Figure 2, Page 5**). Other than this report, there were no notices of this incident filed with the PSC by Sakakawea. It is not clear whether the water line had been marked through ND One-Call prior to the incident.

3.6.2 Landowner Coordination

Equipment and staging areas had been cleaned up post-construction. No landowner or community concerns had been filed with the PSC to date. The Construction Inspection Report noted that the McKenzie County road permit had been revoked at one point during construction, but presumably the issue was resolved and construction resumed (Docket 112, Construction Inspection Report, Photos 13-15, GPS Point #444) (**Figure 2, Page 5**).

3.6.3 Soil Segregation

Observations were made at some locations during previous inspections that indicated topsoil was removed, stored and replaced properly. However, observations were also made at several locations during previous inspections that indicated topsoil was not removed to appropriate depths, or was handled or stored improperly. Issues appeared to persist throughout construction and backfilling (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report). Observations during the as-built inspection seemed to indicate topsoil replacement was adequate to support establishment of crops in cropland areas and grasses seeded in non-cropland areas (**Appendix B**, multiple photos). Some locations had lighter-colored soils on the surface which would possibly indicate mixing with subsoils (**Photo 4, Observation Point 609; Photo 16, Observation Point 616; Photo 33, Observation Point 633; Photo 34, Observation Point 634**). Points 631 – 634 of this report coincide with points 280 – 284 of the Topsoil Inspection Report where issues with topsoil segregation were noted. At multiple other locations which coincided with previous inspections, it appeared the segregation issues noted in previous reports had been resolved during the reclamation process (**Observation Points 612, 613, 615, 619, 622, 627**).

3.6.4 Pipeline Depth & Road Boring

The pipeline must be buried to specified depths depending on the surface use. The Application specifies that Sacagawea uses a minimum 48 inches (of soil cover) from the surface contour, as required (Docket 1, Consolidated Application). Wenck visually confirmed pipeline depth at a few locations during construction inspections and pipe depth appeared to be buried to at least the specified depth (Docket 112, Construction Inspection). Wenck visually confirmed boring operations across several roads during construction inspections

(Docket 112, Construction Inspection) and also verified several additional crossings during the as-built inspections (**Photos 1, 10, 11, 14, 21, 27, 30, 32**).

3.6.5 Erosion & Sedimentation

The Project Application states BMPs would be used during and after construction to minimize soil erosion and protect surface water (Docket 1, Consolidated Application). Sacagawea consulted with the Corps, NDDH, and EPA regarding minimizing erosion and sedimentation (Docket 1, Consolidated Application, Appendix C: Consultation; Docket 49, Exhibit 11, ND Department of Health letter to PSC; Docket 90, NDDH Comments).

Topsoil and construction inspections noted some locations where silt fences were in place to protect streams or wetlands from sedimentation. The construction inspections noted multiple observations of water bodies or wetlands without erosion control in place, with erosion control or silt fences inadequately maintained, and soil piles within or near waterbody features with no erosion control (Docket 108, Topsoil Inspection Report; Docket 112, Construction Inspection Report). Refer to case number PU-16-582, "Corridor Certificate 177/Route Permit 189, Compliance" for further information on these observations and reported potential violations, responses by Sacagawea, and resolution of the issues.

During the as-built inspection, it appeared the issues noted in previous reports had been resolved during the reclamation process (**Observation Points 612, 613, 615, 619, 622, 627**). There were no obvious problem areas with erosion or sedimentation as a concern (**Photos 1, 11, 13, 19, 27, 32**). A couple locations on steep slopes had erosion control in place where upland vegetation had not yet established; the erosion control features were in good condition and maintained (**Photo 16**).

3.6.6 Reclamation & Roads

Sacagawea committed to reclamation as described in their Reclamation Plan for the Project (Docket 1, Consolidated Application, Appendix K: Construction, Mitigation, and Reclamation Plan). Monthly construction reports indicated cleanup and reclamation began concurrently with construction activities. According to monthly construction reports, backfilling was complete on all the spreads by September 2016, and clean-up was about halfway complete. Clean-up and re-seeding continued in June and July 2017, with the east side of the Lake complete in June 2017, and the west side of the Lake continuing into July and August 2017. Sacagawea's contact Mr. Stelzer noted via email that a gas line was installed adjacent to the Project in 2017 on the west side of the Lake; reclamation and re-seeding was completed during the 2018 season for the gas line and overlapped part of the disturbance from the Project's crude oil line.

At the time of the as-built inspection, construction and re-seeding was completed along the pipeline trench and within staging areas and temporary access roads. Roads had been bored underneath and appeared to be in good condition and properly maintained. Contouring matched adjacent topography. Some follow-up work had been done in a couple areas in 2017 or 2018 to correct subsidence (**Photos 24, 28**).

3.6.7 Fencing, Repairs & Waste

Existing fences or gates that were impacted by pipeline construction appeared to be replaced or repaired as needed. High-quality gates had been installed to access the ROW (**Photos 16, 17, 24, 32, 35, 37**). No waste or equipment were observed along the route.

3.6.8 Lake Sakakawea Bore

Sacagawea consulted with the Corps and other agencies and prepared geotechnical studies and engineering plans associated with required permits (Docket 1, Consolidated Application, Appendix I: United States Army Corps of Engineers NWP #12 PCN Section 10 Permit). The construction inspection did not indicate any issues with observations of the boring operations under Lake Sakakawea (Docket 112, Construction Inspection Report, Photos 8 and 9, GPS Point #449). Refer to case number PU-16-582, "Corridor Certificate 177/Route Permit 189, Compliance" for further information on reported potential violations regarding the bore under the Lake, responses by Sacagawea, and resolution of the issue. No issues were noted on the bore entry location on the east side of the Lake at the time of the as-built inspection (**Photo 28, Observation Point 628**).

3.7 OPERATION

3.7.1 Record-keeping & Compliance

No concerns were identified during the site review that would indicate that Project operation was out of compliance with the Order or Certificate of Site Compatibility. No reports of extraordinary events during operation were filed to date with the PSC.

3.7.2 Maintenance

Sacagawea indicated that the pipeline would be regularly inspected and maintained (Docket 1, Consolidated Application). There was no waste, debris, or abandoned equipment observed during the inspection. The route appeared to be regularly maintained.

3.7.3 Public Access & Safety

Sacagawea consulted with the NDDH regarding public health and safety (Docket 1, Consolidated Application, Appendix C: Consultation; Docket 49, Exhibit 11, ND Department of Health letter to PSC; NDDH Comments). Sacagawea committed to NDDH recommendations including minimizing fugitive dust emissions, minimizing noise levels during construction, leak monitoring, and spill prevention and response.

Examples of operational safety measures observed during the inspection were the use of personal protective equipment and warning signs marking the pipeline route. Pipeline markers with contact information had been installed and were in place at fence lines and road crossings (**Appendix B, multiple photos**). Fences with locked gates and warning signs were in place around all observed valve settings to prevent access by the public (**Photos 1, 12, 28, 36**).

3.7.4 Spill Prevention & Response

Sacagawea consulted with the NDDH regarding public health and safety (Docket 1, Consolidated Application, Appendix C: Consultation; Docket 49, Exhibit 11, ND Department of Health letter to PSC; NDDH Comments). Sacagawea committed to NDDH recommendations including leak monitoring and spill prevention and response. Sacagawea provided leak monitoring and spill response information and plans during the siting application process (Dockets 53-55, Late-filed Exhibit 12: Spill Histories; Late-filed Exhibit 13: Leak monitoring information / spill response scenarios including draft spill response plan; Late-filed Exhibit 14: Pigging Information). No spills or leaks have been reported to date.

4.0 Issues to Resolve and Recommendations

4.1 AS-BUILT FILES

As-built alignment drawings were submitted to the PSC 23 March 2017, along with confidential GIS information (Docket 119, As-Built Drawings). However, the as-built drawings in the Docket are for Sacagawea's Johnson's Corner Pipeline, PU-15-744. Wenck recommends the PSC determine if the correct drawing were mis-filed and if not, to request the correct as-builts and GIS data from Sacagawea.

4.2 VEGETATION ESTABLISHMENT

At the time of the inspection, the land had been restored to its pre-construction contours. Areas impacted by pipeline construction (except aboveground facilities) were returned to previous land use, including cropland, hayland/CRP, and rangeland. The condition of most areas of hayland or cropland looked better or comparable within and outside of the ROW. In non-cultivated areas (rangeland), seeded grasses had germinated in all areas, but their establishment varied from being well-established with good cover to being sparse with high annual weed cover. Though vegetation was not fully established, it appeared to be have been properly reclaimed and there were no large areas of bare soil, erosion, noxious weeds, or other issues. No spot work is recommended at this time, though depending on monitoring results there may be some maintenance items in the future. An adjacent gas line had been installed in 2017 and re-seeded in spring 2018 on the portion of the Sacagawea line west of Lake Sakakawea; part of this reclamation work overlapped with the Project construction ROW. Therefore, the revegetation inspection contracted by the PSC is planned in 2019 to document establishment of vegetation.

4.3 TREE AND SHRUB MITIGATION

Sacagawea provided a "Tree/Shrub Mitigation Plan" (Docket 115, Tree and Shrub Mitigation Plan), which was approved by the Commission 30 November 2016. The Project-specific plan describes that the planting of trees and shrubs and three-year survival monitoring will be completed by the county NRCS offices. No annual reports have been submitted to date. It is recommended that the PSC follow up with Sacagawea regarding the status of tree mitigation efforts and to request survival reports.

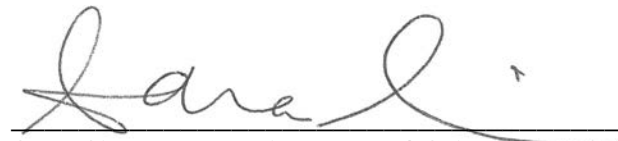
5.0 References

- North Dakota Public Service Commission (ND PSC). 2018. Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed October-November 2018.
- Weiler, Mark. 2018. Sacagawea Pipeline Representative. Personal Communication: discussion during site visit on 26 September 2018.

6.0 Signatures

The services performed by Wenck staff for this project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area under similar time and budget constraints. Recommendations and findings contained in this report represent our professional judgment and are based upon available information and technically accepted practices at the present time and location. Other than this, no warranty is implied or expressed.

Lead Project Manager and Environmental Scientist, Sara Simmers, prepared the report.



A handwritten signature in cursive script, appearing to read "Sara Simmers", is written over a horizontal line.

Sara Simmers, Environmental Scientist

11/19/18

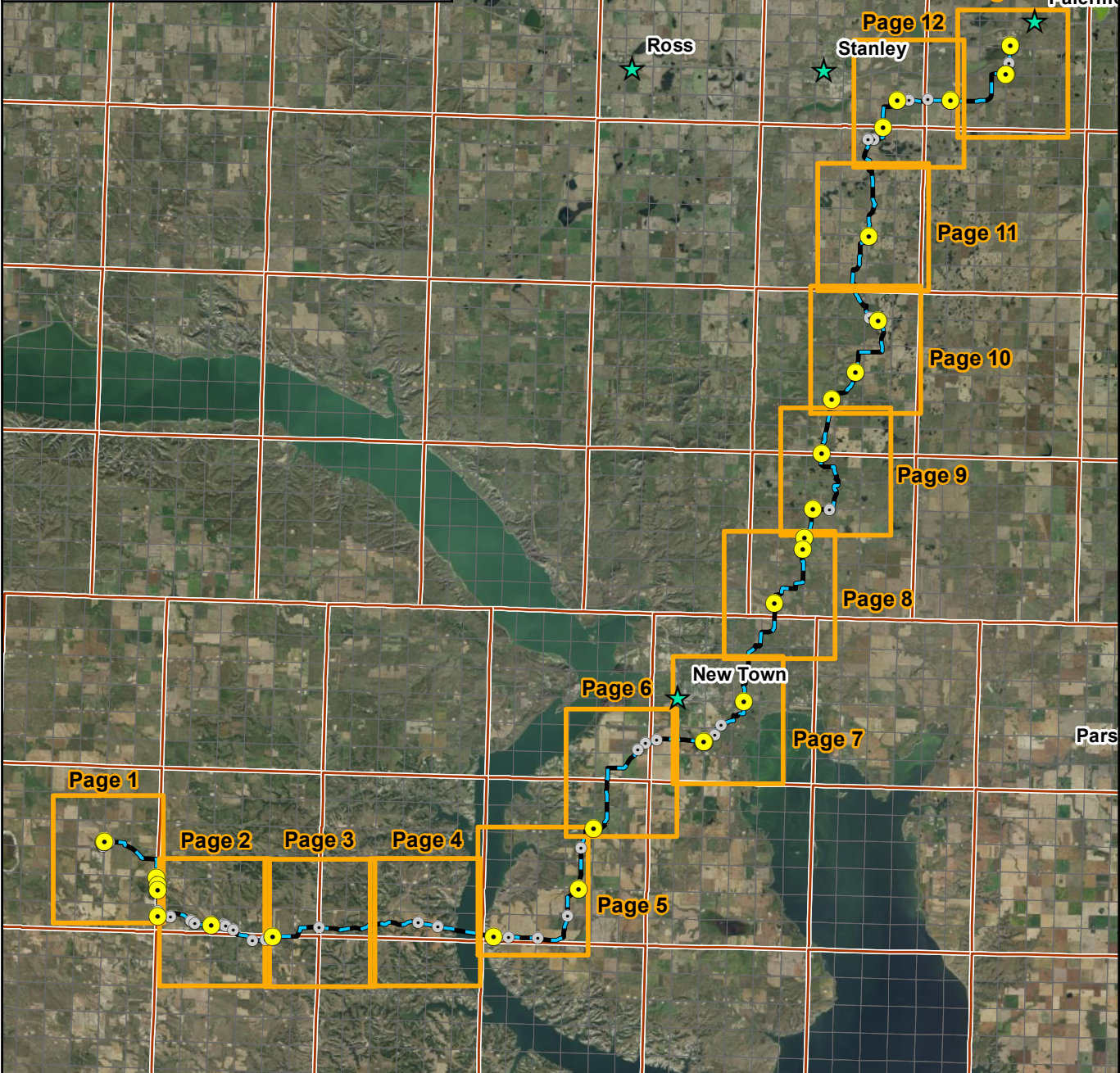
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Figure 1

Figure 2

Field Observation Points

- As-Built Inspection Observation Points
- Past Observation Points
- Figure 2 - Sheets
- Sacagawea Pipeline
- Township
- Section



2017 Aerial Photograph (Source: ND GIS Hub)

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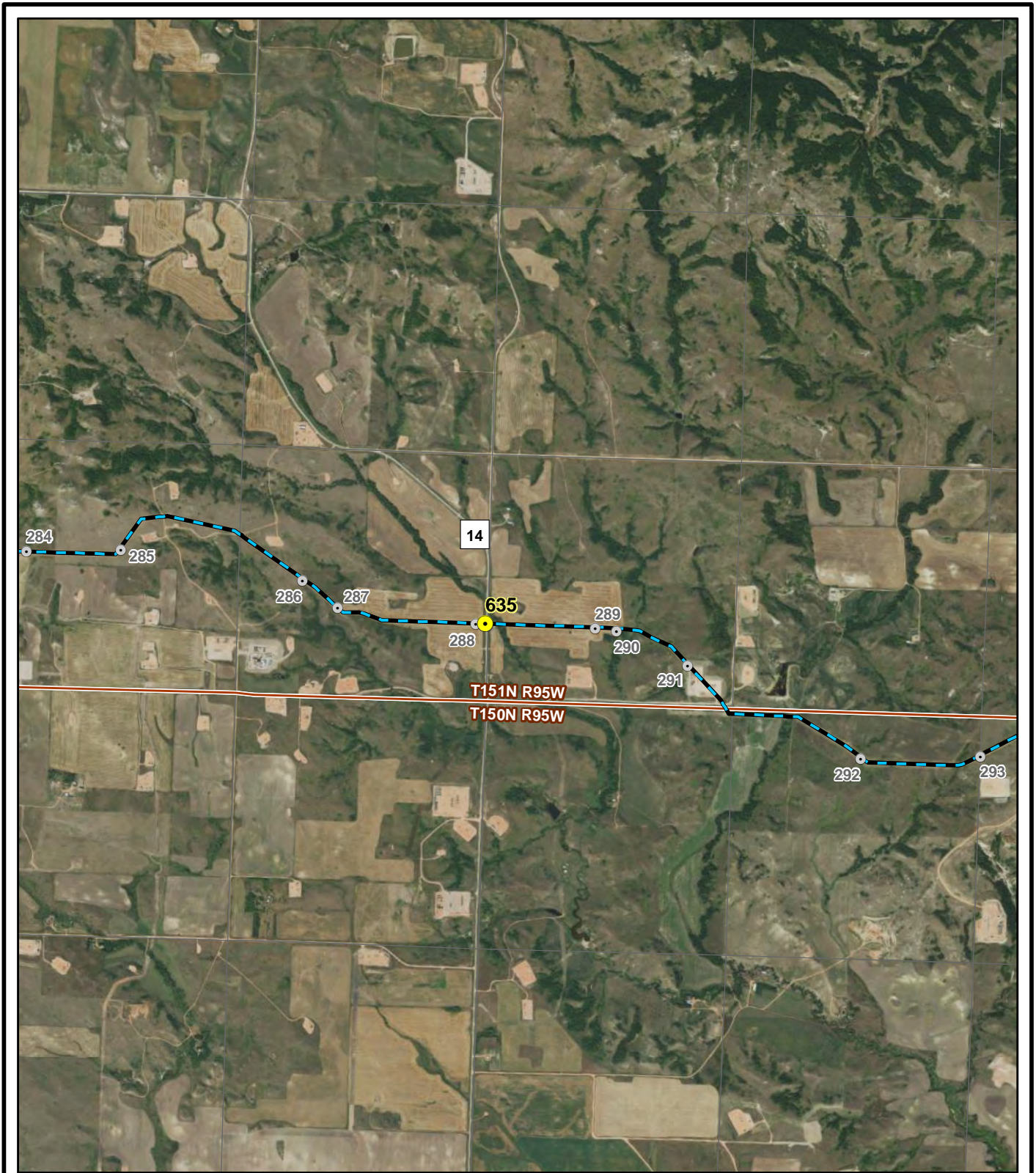
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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- ▭ Township
- ▭ Section

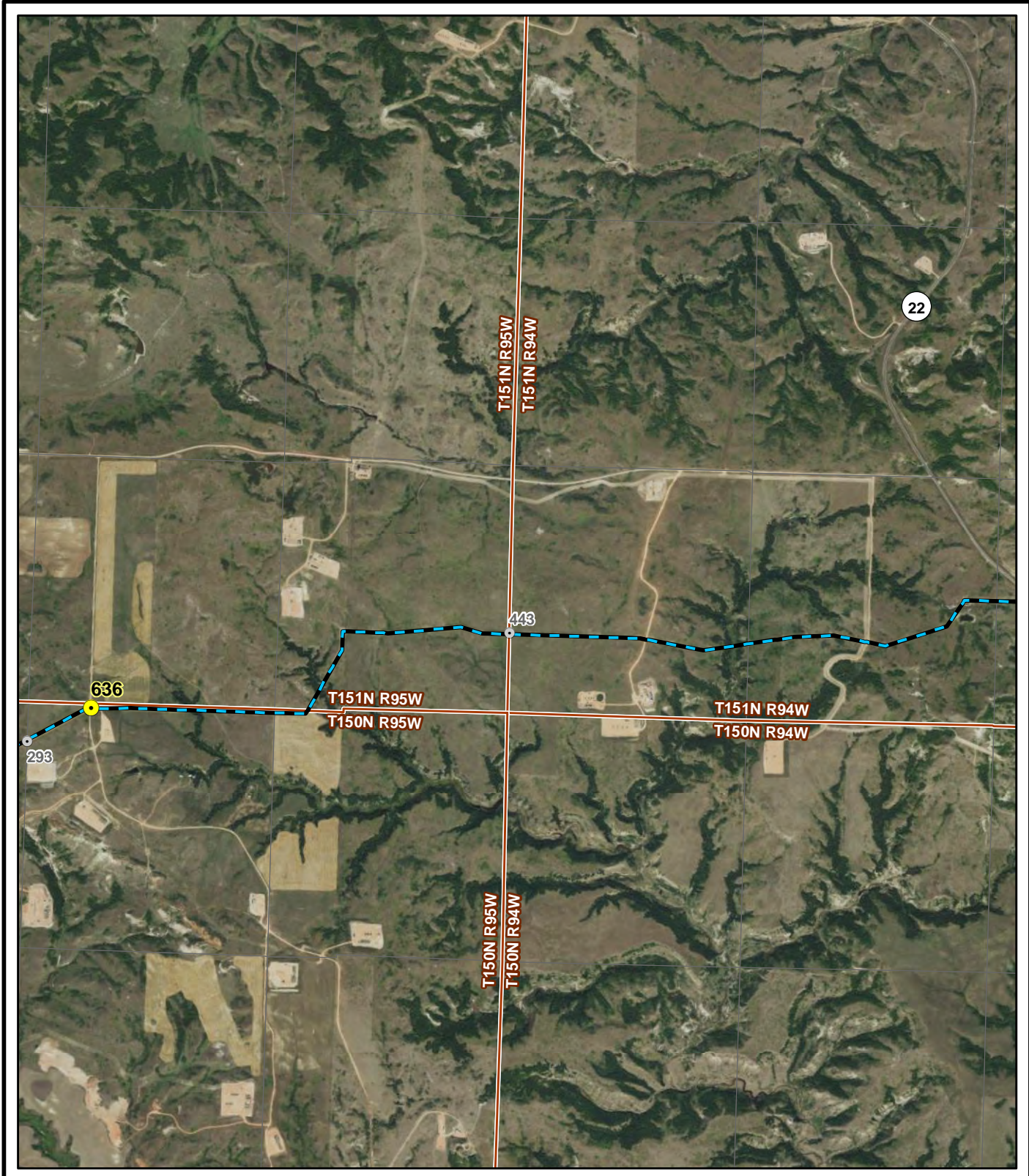


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- As-Built Inspection Observation Points
- Past Observation Points
- - - Sacagawea Pipeline
- Township
- Section



2017 Aerial Photograph (Source: ND GIS Hub)
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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- ▭ Township
- ▭ Section

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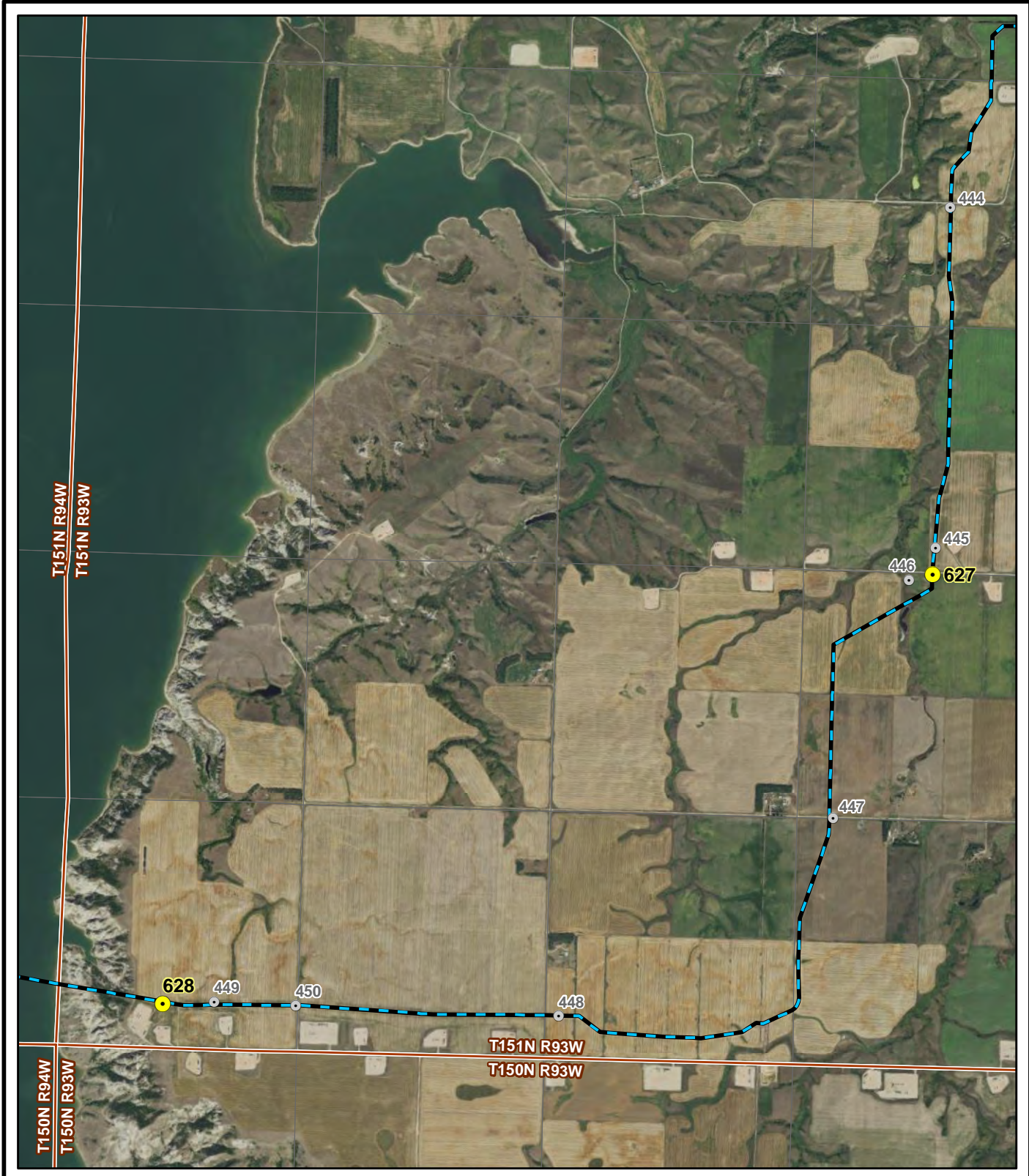
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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- ▭ Township
- Section

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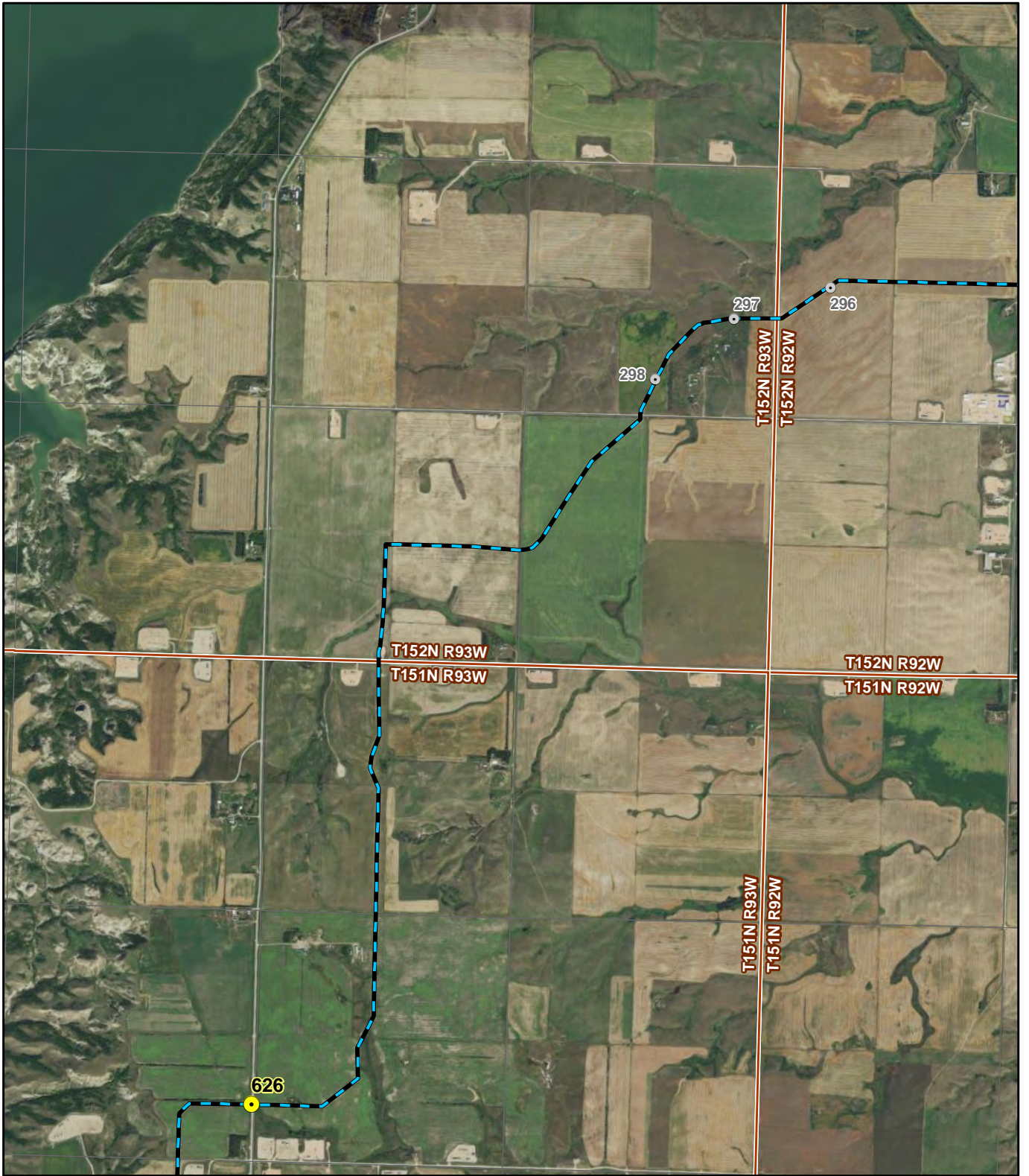


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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section



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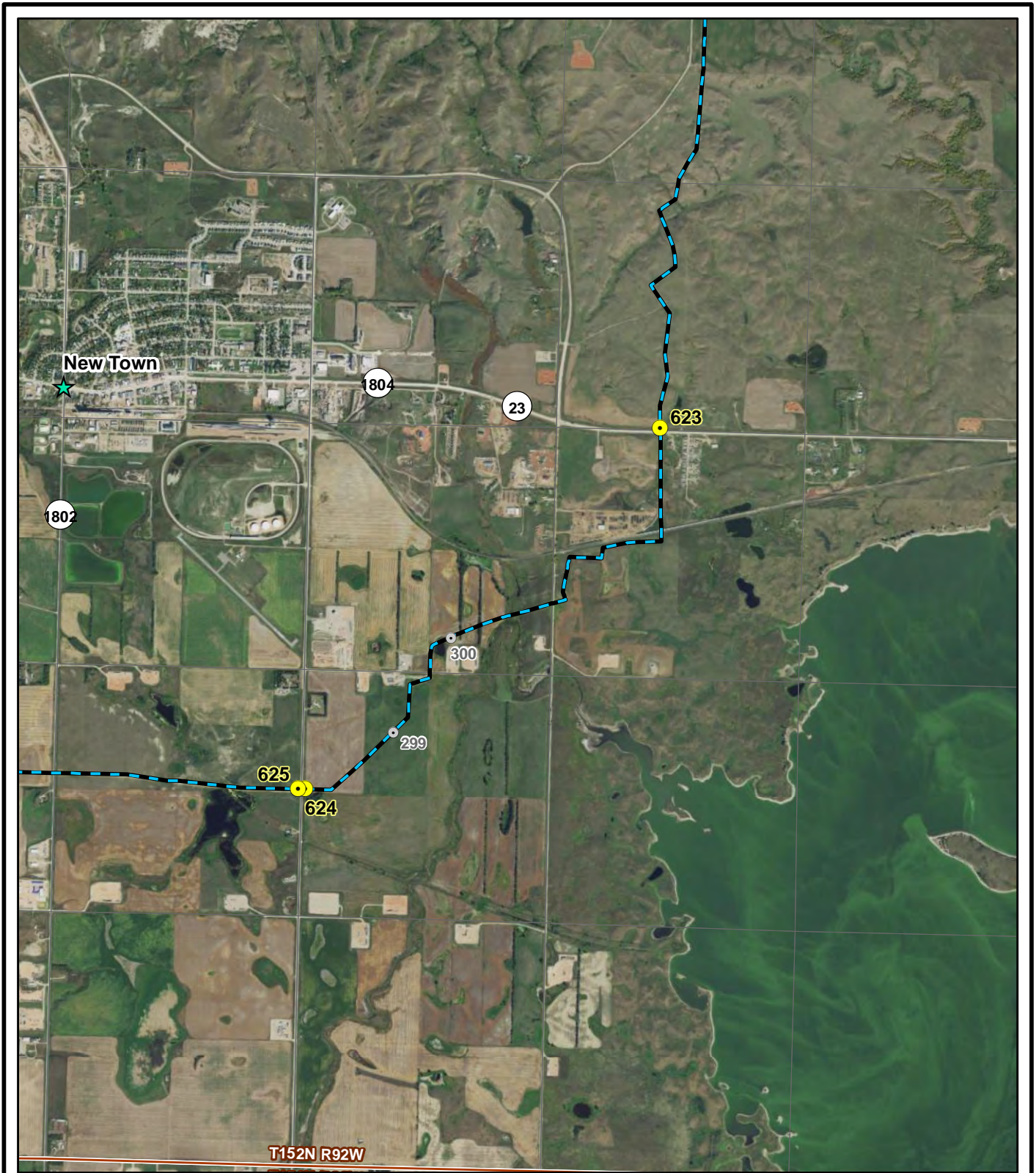
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Feet



- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section

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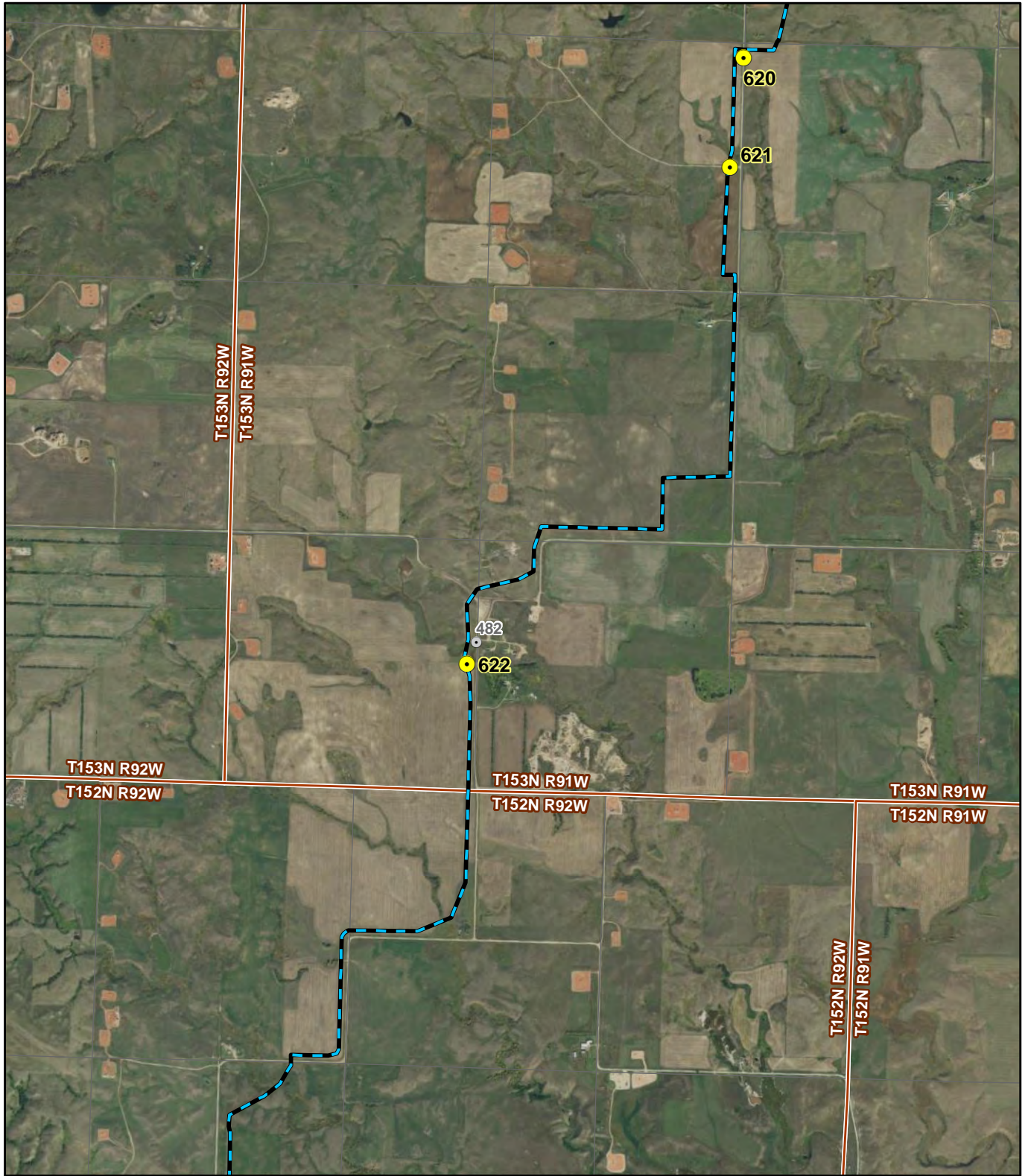


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- As-Built Inspection Observation Points
- Past Observation Points
- ▬ Sacagawea Pipeline
- ▭ Township
- ▭ Section

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2017 Aerial Photograph (Source: ND GIS Hub)

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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section

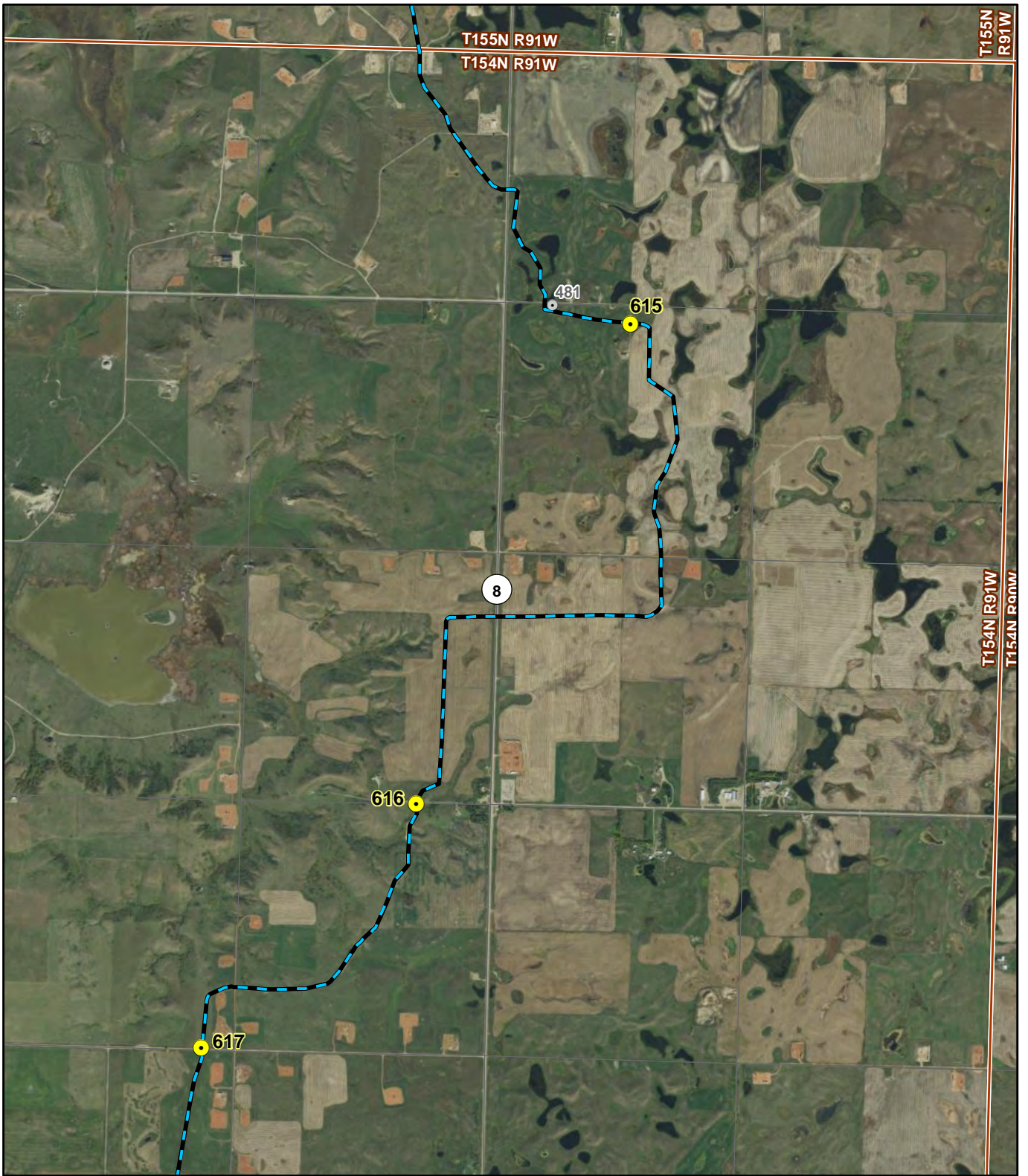


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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section

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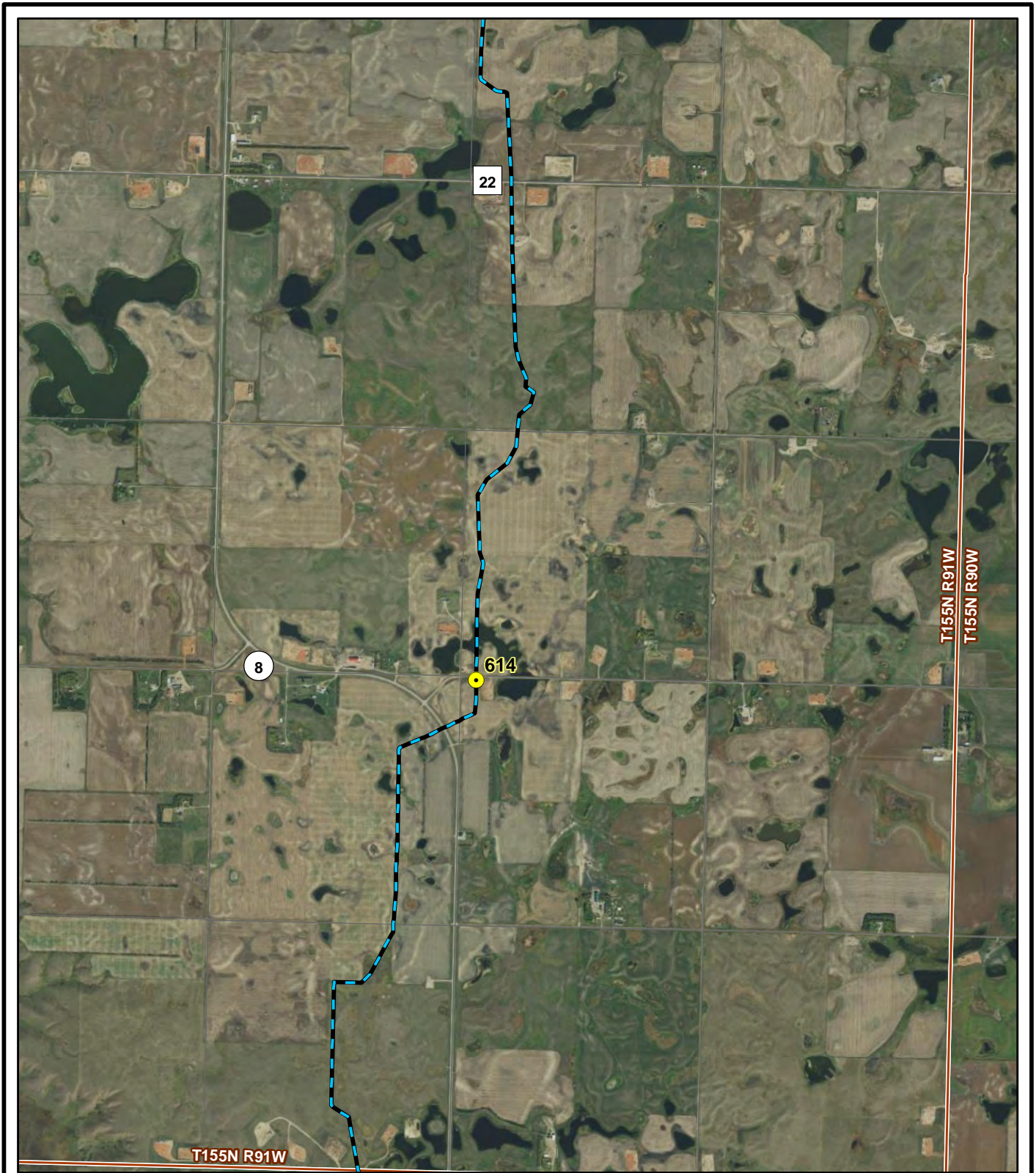
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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- ▭ Township
- Section

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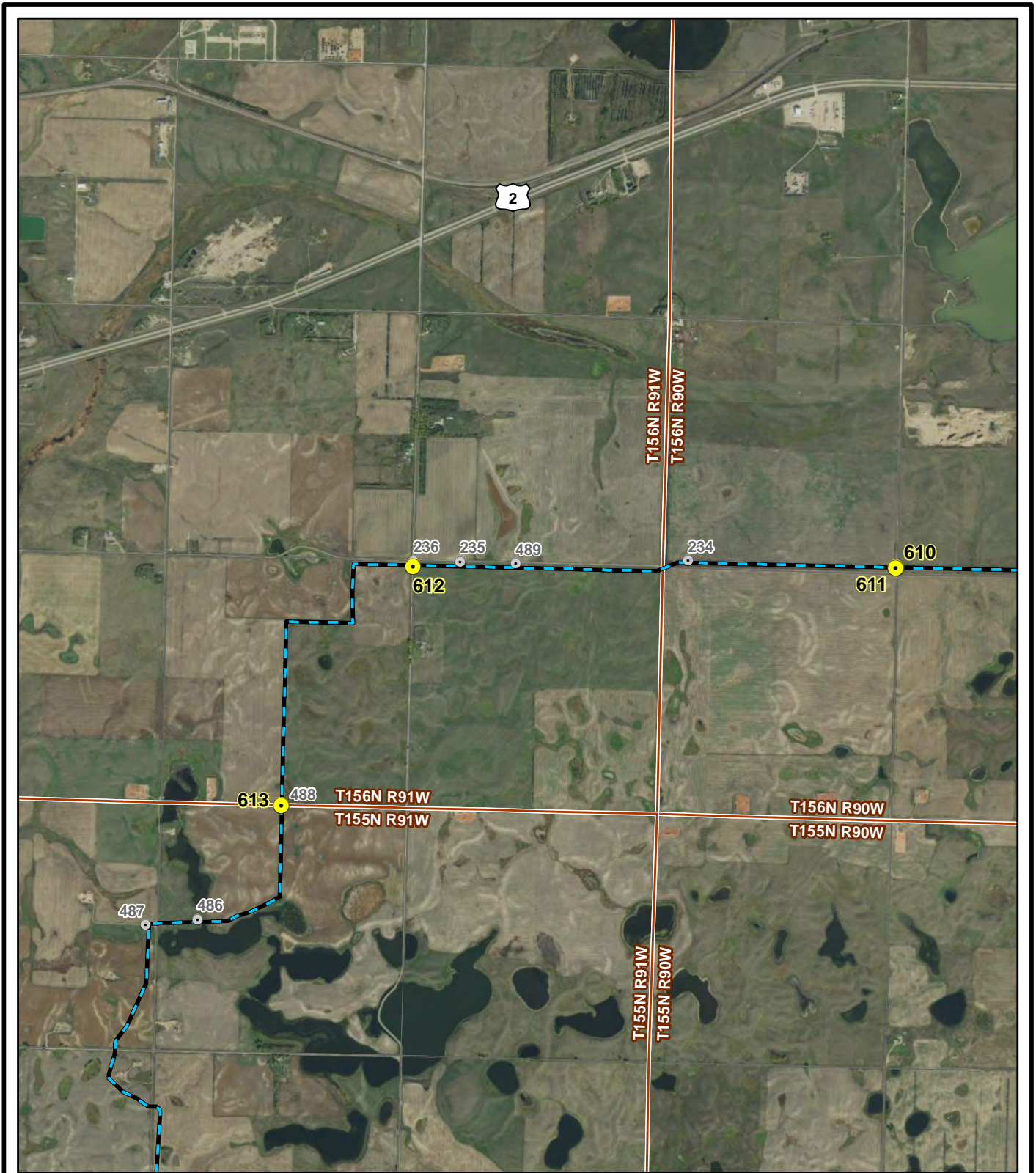


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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section

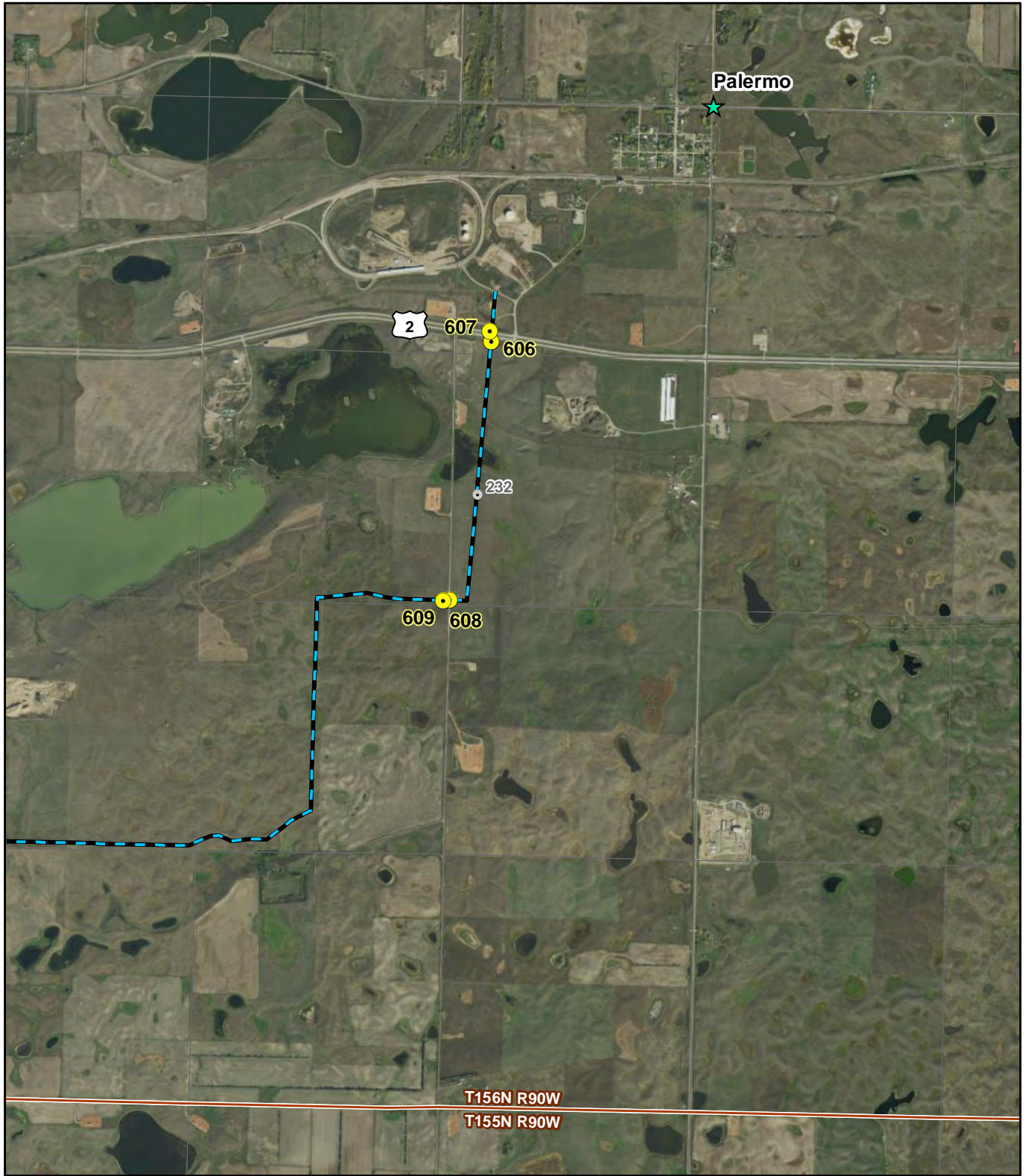


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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- Township
- Section

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2017 Aerial Photograph (Source: ND GIS Hub)

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Feet



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- As-Built Inspection Observation Points
- Past Observation Points
- Sacagawea Pipeline
- ▭ Township
- ▭ Section

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Photographs



Photo 1. (GPS Point #607) Direction: North. The valve setting in the upper left of the photo (red arrow) is the connection of the Sacagawea pipeline to the Palermo Rail Terminal Facility on the north end of the route. Pipeline marker for the line is visible in the lower right. Wetland in foreground was bored underneath as part of the bore under U.S. Highway 2.



Photo 2. (GPS Point #606) Direction: South. Pipeline ROW to the south of U.S. Highway 2, through wide, low swale in rangeland. Sacagawea ROW is the route on the left of the photo. Vegetation cover was adequate and appeared to be well-established following reclamation.



Photo 3. (GPS Point #608) Direction: East. Pipeline ROW through alfalfa hayland. ROW is not discernible from adjacent hayland. Alfalfa was re-seeded in this tract.



Photo 4. (GPS Point #609) Direction: West. Two-track road follows pipeline ROW over hill. Landowner has used ROW for access, forming two-track. Alfalfa hayland to the north. Gravelly surface soils on hilltops are typical, though they may be indicative of subsoils mixed with shallow topsoil during trenching. Vegetation was primarily yellow sweetclover, crested wheatgrass, slender wheatgrass, and a minor component of annual weeds.



Photo 5. (GPS Point #610) Direction: East. Pipeline ROW through alfalfa hayland to the east of 77th Ave NW. ROW has denser alfalfa growth compared to outside ROW.



Photo 6. (GPS Point #611) Direction: West. Pipeline ROW through cropland (wheat stubble) to the west of 77th Ave SW. Stubble density was indiscernible within or outside ROW. Contouring matches adjacent topography.



Photo 7. (GPS Point #612) Direction: East. Pipeline ROW through alfalfa hayland to the east of 79th Ave NW. ROW has denser alfalfa growth compared to outside ROW.



Photo 8. (GPS Point #612) Direction: West. Pipeline ROW through cropland (wheat stubble) to the west of 79th Ave NW. Stubble density was indiscernible within or outside ROW.



Photo 9. (GPS Point #613) Direction: North. Pipeline ROW through cropland. This segment of the pipeline was bored underneath the gravel road to the south (60th St NW) and the wetland in the distant right of the photo. The wetland appeared to have naturally-growing vegetation on the margins with no indications of previous disturbance.



Photo 10. (GPS Point #613) Direction: South. Pipeline ROW through cropland to the south of 60th St NW. Stubble density appeared somewhat less within ROW.



Photo 11. (GPS Point #614) Direction: North. Pipeline ROW was bored underneath the gravel road 56th St NW, the cropland parcel in the foreground, and the wetland in distance. Gravelly, bare spots in field were naturally-occurring (i.e., not part of Project disturbance).



Photo 12. (GPS Point #614) Direction: South. Valve setting in corner of wheat field on south side of 56th St NW. Setting and access road appeared to be well-maintained. Fenced and locked facility. Vegetation around facility had been disturbed during construction and was primarily annual weeds and foxtail barley.



Photo 13. (GPS Point #615) Direction: East. Pipeline ROW through low-lying grassland along edge of wetland to the north. Vegetation cover was dense and even; there was some bare soil at ground level. Appeared tall wheatgrass and yellow sweetclover had been planted.



Photo 14. (GPS Point #615) Direction: West. Pipeline ROW through alfalfa hayland to the west of a gravel driveway which had been bored underneath. Wild oats were within alfalfa stand, which may have been cover crop in seed mix.



Photo 15. (GPS Point #616) Direction: Northeast. Pipeline ROW angles northeast over hill to the north of 51st St NW. Contouring matches topography. Vegetation cover was good, with some bare ground at base. Tall wheatgrass, yellow sweetclover, blue grama, and sideoats grama had been planted. Smooth brome and Canada thistle were also present.



Photo 16. (GPS Point #616) Direction: South/Southwest. Pipeline ROW to the south, then veers to the southwest across rolling hills, along buffaloberry shrub patches. Erosion control logs and mats still in place on bare areas on steep sideslopes. Note fence and gate replaced.



Photo 17. (GPS Point #617) Direction: North/Northeast. Pipeline ROW through planted introduced grass, likely CRP, to the north of 50th St NW. Vegetation growth in ROW was visibly different, with annual weed cover and some bare ground; however re-seeded grass cover was coming in and should establish over time.



Photo 18. (GPS Point #617) Direction: South/Southwest. Pipeline ROW to the south of 50th St NW through alfalfa hayland. ROW was visibly different; grasses had been planted. This area had been noted as having noxious weeds during natural resource surveys.



Photo 19. (GPS Point #619) Direction: East. Pipeline ROW through rangeland on state-owned surface lands, parallel on the south side of 46th St NW. Wetland basin on left had been trenched; wetland vegetation had established on margins, primarily foxtail barley. On the ROW, it appeared some planted grasses were coming in, though annual weed cover was also high. Dominant species included intermediate wheatgrass, sweetclover, curlycup gumweed, Canada bluegrass, and dandelion. Grazed this year.



Photo 20. (GPS Point #622) Direction: North. Pipeline ROW parallels 83rd Ave NW to the west. Grassland area had been mown. Some bare ground, but grasses are coming in.



Photo 21. (GPS Point #623) Direction: North. Pipeline ROW markers visible on hills in distance. Reclamation looks adequate. Foreground portion of field had been part of pipeline segment bored across ND Highway 23 to the south.



Photo 22. (GPS Point #624) Direction: East/Northeast. Pipeline ROW through cropland on east side of 88th Ave NW. Past tree patch on right of photo the route turns northeast. Tree patch had been avoided, with ROW skirting its north side.



Photo 23. (GPS Point #625) Direction: West. Pipeline ROW through alfalfa hayland to west of 88th Ave NW. Reclamation was somewhat weedy with Russian thistle and kochia. Route avoided tree patch in distance.



Photo 24. (GPS Point #626) Direction: East. Pipeline ROW through cropland to east of 92nd Ave NW. According to the Sacagawea representative Mr. Weiler, the landowner has concerns about subsidence, which Sacagawea will be addressing this fall or next spring.



Photo 25. (GPS Point #626) Direction: West. Pipeline ROW through cropland to west of 92nd Ave NW. Bored across road and under low area in foreground. Routed parallel to south of tree row in distance. Crop stubble looked good within and outside ROW. Contouring matched adjacent topography.



Photo 26. (GPS Point #627) Direction: North. Pipeline ROW through field of soybeans on north side of 32nd St NW. No visible difference within or outside of ROW.



Photo 27. (GPS Point #627) Direction: West. Pipeline ROW parallels south side of 32nd St NW. Cropland stubble looked comparable in density within and outside ROW. Drainage crossing in distance (not clearly visible in photo) was repaired adequately and revegetated.



Photo 28. (GPS Point #628) Direction: East. Lake Sakakawea bore work space on east side of Lake. Valve setting is enclosed in locked fence (where pickup is parked). Kochia growth in the cropland (basal green plants) appeared denser in workspace area compared to the adjacent undisturbed area, though Canola stubble density appeared comparable. Surface soil color was dark indicating topsoil replacement. Some unevenness in contours in this area; Mr. Weiler indicated some dirt work had been done in spring 2017.



Photo 29. (GPS Point #629) Direction: South. Pipeline ROW through field, parallel to ND Highway 23 on west side. Multiple lines in parallel accessing or leaving the Keene Crude Oil Terminal over the hill.



Photo 30. (GPS Point #630) Direction: West. Pipeline ROW through field west of ND Highway 23. Sacagawea line is on north side; a gas line parallels it and was completed in January 2017 and seeded in spring 2017.



Photo 31. (GPS Point #631) Direction: North. Pipeline ROW through field north of 32nd St NW. Field had been tilled after harvest.



Photo 32. (GPS Point #631) Direction: South. Pipeline was bored across road (32nd Ave SW) and drainage visible in foreground, then trenched in alfalfa hayland. The Sacagawea line had been seeded and had annual weed cover (the gas line is the most recently disturbed line visible on far left).



Photo 33. (GPS Point #633) Direction: East/Southeast. Pipeline ROW in foreground through rangeland running to east, then turns south through woody vegetation. Area had been seeded and germinated at less than 10% cover. Cover of annual weeds low and no noxious weeds visible, but the area had been recently reclaimed and heavily grazed.

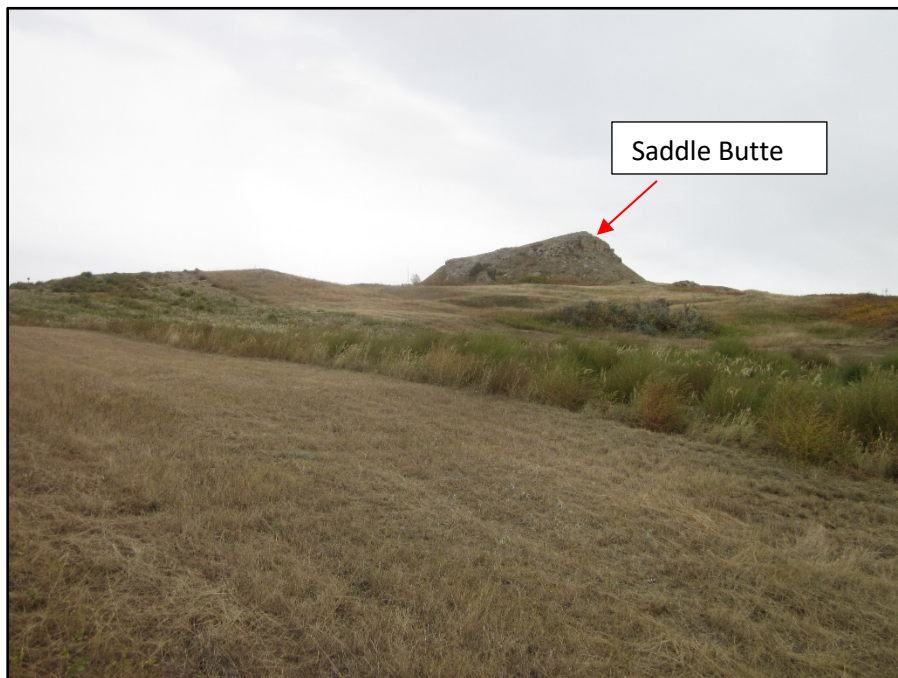


Photo 34. (GPS Point #634) Direction: North/Northeast. Pipeline ROW on edge of field over steep hills west of Saddle Butte. Contouring was good and erosion control was in place due to gas line installation. Kochia and the cover oats were dominant. Lots of bare ground with light-colored soils on surface. Seeded grasses did not take well at less than 5% cover.



Photo 35. (GPS Point #635) Direction: West. Pipeline ROW through field on the north of the valve setting in the distance. The valve is for the adjacent gas line. Saddle Butte visible in the distance.



Photo 36. (GPS Point #635) Direction: East. Valve for Sacagawea line. Pipeline ROW continues east through field. Contouring was good. Crop stubble was thinner in ROW.



Photo 37. (GPS Point #636) Direction: Southwest. Pipeline ROW on west side of 103rd Ave NW through rangeland. Seeded grasses appeared to be coming in but annual weeds were common.



Photo 38. (GPS Point #636) Direction: Southeast. Pipeline ROW east of 103rd Ave SW through hayland. Bare ground and annual weeds (kochia) in high amounts.

