



PU-21-048
Bridger Pipeline, LLC.
South Bend 16-inch Crude Oil
Pipeline
Construction Inspection Report

File No. 227705201

September 2022

Prepared for:

North Dakota Public Service Commission
600 E. Boulevard Avenue
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1.0 EXECUTIVE SUMMARY

The North Dakota Public Service Commission (PSC) retained Stantec Consulting Services Inc (Stantec) to complete inspection(s) during construction of the Bridger Pipeline, LLC. South Bend 16-inch Crude Oil Pipeline, PU-21-048 (i.e., the Project) in Golden Valley and McKenzie County, North Dakota. The purpose of the inspections is to ensure the Project is constructed in compliance with the siting laws and rules and the applicable PSC Orders for the Project, which includes requirements regarding pipeline depth and soil segregation, among others.

Project construction involving topsoil disturbance commenced on June 22, 2022 in Golden Valley County, ND. Stantec was present to observe topsoil salvage and segregation by Loenbro Construction Company, Inc. (i.e., Loenbro) on June 22-23, 2022. Loenbro is constructing Spreads 1 and 2 along the western segment of the Project, and Tomahawk Pipeline Construction (Tomahawk) is constructing the northeastern most 26 miles identified as Spread 3. Tomahawk began work on Spread 3 on or near July 25th. Stantec informed the PSC of Tomahawk's planned start date on July 15th, but was not asked to conduct an initial topsoil inspection of the Tomahawk spread. As of September 4, 2022, a majority of Spread 1 had been reclaimed, while trenching was ongoing along Spreads 2 and 3.

This Construction Inspection Report includes documentation of right-of-way (ROW) alignments, topsoil and subsoil segregation, and pipeline depths during the September 14-15, 2022 on-site inspections of the Project. Overall, trenching depths and soil removal and storage along the ROW were satisfactory. Sporadic areas of inadequate topsoil strip depths were observed, which may be mitigated if proper care is taken to only replace topsoil to these areas during reclamation. Portions of the Project occur on steep side slopes and contain large amounts of excavated rock and subsoil. Safe and appropriate reclamation on these areas may be difficult and thorough post-construction inspections may be required to assess any issues regarding the replacement and regrading of soil. Lastly, work along wetland and stream areas appeared to be performed using best management practices (BMP's) and in compliance with PSC Orders, except for one area where a lack of erosion-control was allowing stripped topsoil to migrate into the Bennie Peer Stream wetland fringe (Spread 2).

Stantec recommends the PSC inform Bridger Pipeline LLC (Bridger) of the concern along Bennie Peer stream and request them to remove any observed sediment that may temporarily be in the wetland from construction activities. It is also recommended for the stripped positions of the ROW that still contain unstripped topsoil, that contractors ensure all topsoil, up to 12-inches, is appropriately segregated prior to or during trench excavation, and that topsoil is replaced appropriately during reclamation activities, and topsoil compaction be mitigated where equipment traffic has resulted in soil compaction of in-situ topsoil.



2.0 BACKGROUND INFORMATION

2.1 INTRODUCTION

Bridger Pipeline LLC is constructing the South Bend Crude Oil Pipeline in Golden Valley and McKenzie County North Dakota. The transmission pipeline route within North Dakota stretches between Eighty Eight Oil Company's (EEOC) existing Johnson's Corner Terminal to the Montana border, and is approximately 81 miles long. Much of this route is through the US Forest Service-Little Missouri National Grasslands, and the corridor includes a mix of public and private parcels.

2.2 PURPOSE & SCOPE

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. Construction inspections aim to 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 PSC Findings of Fact, Conclusions of Law, and Order (Order). The PSC issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-21-048 on June 8, 2022, granting Certificate of Corridor Compatibility No. 227 and Route Permit No. 237 for the Project.

The PSC retained Stantec to complete construction inspections of the Project. The inspection process included a review of the Application for Corridor Compatibility and Route Permit, the Project's Order, and other applicable documents. The primary intent of the inspections is to document compliance with PSC's Findings of Fact (FoF) and Project Order Provisions:

FoF #24; "Construction of the Project will not result in the permanent drainage or filling of wetlands or waterbodies. Bridger will avoid impacts to wetlands and waterbodies by utilizing the HDD technique. The Project crosses twelve named creeks, including Cherry Creek, all of which will be avoided through HDD."

Order Provision #11; "Bridger Pipeline LLC understands and agrees that the pipeline will be 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 section lines."

Order Provision #12; "Company understands and agrees that 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 carefully stripped and segregated from the subsoil. Any area on which excavated subsoil will be placed must first be stripped of topsoil. The stripped topsoil must not be stockpiled in natural drainages, and must be protected from water erosion. Care must be taken to protect topsoil from unnecessary compaction by heavy machinery. Unless otherwise approved by the Commission, topsoil must be



removed before topsoil freezes in the late fall/early winter to the point that frost inhibits proper soil segregation. After backfilling with subsoil 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.”

Order Provision #32; *“Company understands and agrees that it shall inform the Commission in writing of any plans to modify the transmission facility or of any plans to modify the site plan for the transmission facility.”*

2.3 INSPECTION METHODOLOGY

Stantec visually inspected the Project by driving to access points and walking or driving within the Project right-of-way. During inspections, work done by contractors/equipment operators was observed to verify that the topsoil segregation had been conducted appropriately, and to verify pipeline depths. A sub-meter accurate GPS paired with an iPhone was used to collect photographs during the inspection. Location-referenced photographs are provided in Appendix A and Geographical Information System (GIS) generated map(s) of observation locations are provided as Figures 1-18.

Stantec met with two Bridger site supervisors, Tommy Massengale and Dustin Paterson, on Spreads 2 and 3, respectively, and discussed applicable PSC Orders and Provisions for the Construction Inspection.



3.0 INSPECTION RESULTS

3.1 PIPELINE DEPTH

Right-of-way reclamation was near completion in Spread 1. However, Spreads 2 and 3 contained ongoing trenching and pipeline placement. The depth of the pipeline was ≥ 48 inches deep or ≥ 48 below assumed final grades in all inspected areas. The pipeline was also observed to be laid ≥ 72 inches under a township road crossing. **Observation Points 13, 18, 19, 20, 22, 40, 41, 42, 46, 47, 48, 49, 52, 53, and 55** overview inspection points where pipe depths were measured. Stantec did not note any concerns with the depth of trenching and pipe placement accounting for assumed backfill depth at some locations. No open trenches were able to be observed under undeveloped section lines.

3.2 TOPSOIL SEGREGATION

Overall, Stantec did not observe signs of egregious soil handling techniques or disregard for PSC Order #11 (**Observation Points 1, 2, 3, 7, 14, 15, 16, 21, 34, 36, 38, 39, 50, 51, 54**). Topsoil stockpiles were found to be relatively clear of any significant amounts of subsoil mixing. **Observation Point 9** contained subsoil/parent material on the topsoil stockpile for approximately 40 linear feet due to incorrect stripping depth and there was no subsoil stockpile at this point. The surrounding area contained naturally shallow topsoil and the issue appeared to be corrected along the ROW. Stantec recommends the PSC inquire about potentially inspecting the topsoil replacement here to ensure subsoil material is not used for final cover during reclamation. Other topsoil and subsoil stockpiles were confirmed to be placed separately and parallel to each other.

Right-of-way areas on flatter topography were observed to have contain in-situ soil that commonly contained plant roots, but was determined to be subsoil and not in violation of ND PSC rulings (**Observation Points 12, 29, 45, and 46**). A Bridger personnel confirmed that topsoil was stripped up to 12-inches where suitable. **Observation Point 26** (and near **Observation Point 27**) did not appear to contain any stripping at all despite heavy equipment traffic. Unstripped topsoil on the ROW could be susceptible to compaction or subsoil mixing during trenching and soil backfilling, which should be salvaged during trench operations, and compaction mitigated during reclamation.

3.3 GEOLOGICALLY UNSTABLE AREAS AND STEEP SIDE SLOPES

Stantec inspected the ROW near two geologically unstable areas (**Observation Points 22 and 24**). Observations at these points confirmed the avoidance of the specific area identified in the Amended Application (PU-21-48 Docket #44).

Stripping efforts on steep side slopes (**Observation Points 4, 6, 11, 32, 33, and 37**) were also observed. These areas commonly resulted in large stockpiles on the upslope side of the ROW in order to create a flat workspace and did not contain any trenches at the time of inspection. Stantec was unable to closely



inspect the stockpiles due to the height of the side slope cut and could not confirm appropriate segregation of topsoil. Erosion control BMP's were observed in swales of steep slope areas (**Observation Points 24 [Photo 2] and 25**). Stantec also noticed no topsoil was stripped at **Observation Point 11** but may have been due to no natural topsoil at this landform.

While soil backfilling and grading/slope stabilization of steep areas during reclamation may be difficult due to the large quantity of subsoil and rocks excavated for the ROW, this is not a concern within the scope of the construction inspection and will be monitored in future inspections.

3.4 WETLAND AND STREAM CROSSINGS

The Project alignment crosses several wetlands and/or streams and were inspected to ensure compliance with the PSC order provisions. Impacts to wetlands can be mitigated through use of BMP's such as silt fences or timber mats. Wetland/Stream crossings (**Observation Point 5 and 43**) were observed to employ timber mats. However, **Observation Point 5** at the crossing of Bennie Peer Creek and was observed to contain stockpiled topsoil eroding into the stream's wetland fringe. Permanent filling of a wetland would be a violation of PSC Orders, therefore, Stantec recommends reaching out to Bridger to ensure any sediment temporarily there from construction can be removed and restabilized.

Observation Point 11 notes significant ponding water and corresponds with a known wetland on the ROW. Future inspections can verify if long term impacts occurred to the wetland.

Horizontal Directional Drilling (HDD) methods were confirmed on the portion of the alignment crossing Cherry Creek (**Observation Points 28, 30, 31**). Silt fences were also observed at the temporary bridge crossing on Cherry Creek (**Observation Point 30**).



4.0 RECOMMENDATIONS

Construction Inspections for PU-21-048 have verified that the Project, overall, is being constructed in compliance with the siting laws, siting rules, and applicable Commission Orders. However, some minor issues were observed that should be addressed to minimize adverse effects on the environment and the welfare of citizens of North Dakota. Stantec makes the following recommendations to alleviate the issues observed during the Project inspection:

- Request Bridger to remove observed sediment and install erosion control in order to prevent sediment washing in Bennie Peer stream (Observation Point 5).
- Address areas with apparent unstripped topsoil by further topsoil salvage prior to or during trenching, and/or mitigate soil compaction during reclamation by deep-tillage or other means (Observation Point 26).
- Continued backfill of the trench and HDD boring to be conducted to assure the pipeline is buried with a minimum of 48 inches of cover. This is increased to 72 inches of cover across unimproved section lines.
- Contractors and equipment operators must be careful that subsoil is not mixed with topsoil during reclamation and topsoil must be replaced over areas from which it was stripped only after the subsoil is replaced. This may be challenging along areas of the ROW with steep cuts and Bridger should employ a strategy to ensure this is accomplished.
- Monitor activities of topsoil handling as winter approaches. All topsoil stripping must be completed prior to topsoil freezing to the point that ground frost inhibits proper soil segregation, unless otherwise authorized by the PSC.
- Continue implementing BMPs and stockpile protection measures, especially if stockpiles are to be left over winter when spring melting conditions increase soil erosion.




5.0 SIGNATURE

Stantec's Environmental Scientist and Soil Scientist in Training, Zachary Bartsch, conducted this inspection under the supervision of Stantec's Project Manager and North Dakota Professional Soil Classifier, Matt Retka

The conclusions in this Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from the ND PSC and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the ND PSC in accordance with Stantec's contract with the ND PSC. While the Report may be provided to applicable authorities having jurisdiction and others for whom the ND PSC is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.



Matt Retka
Project Manager
Senior Soil Scientist

September 30, 2022




Date

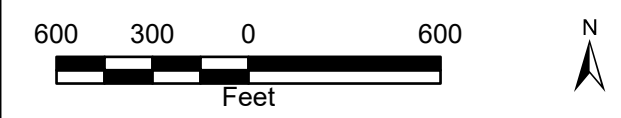
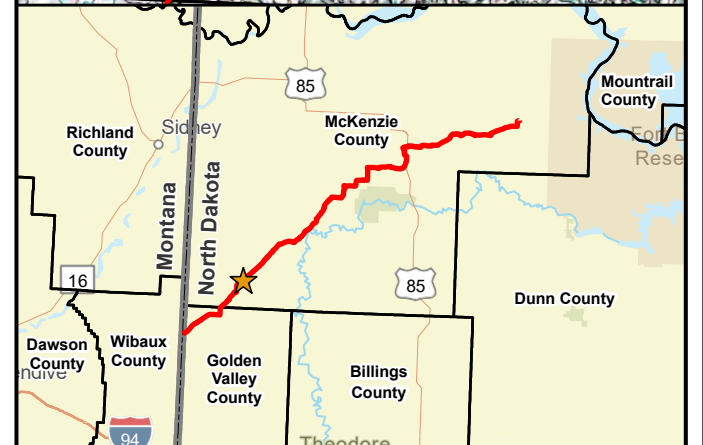
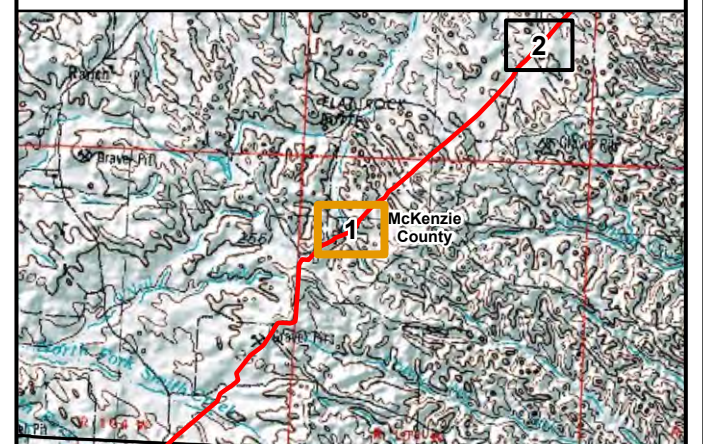


FIGURES

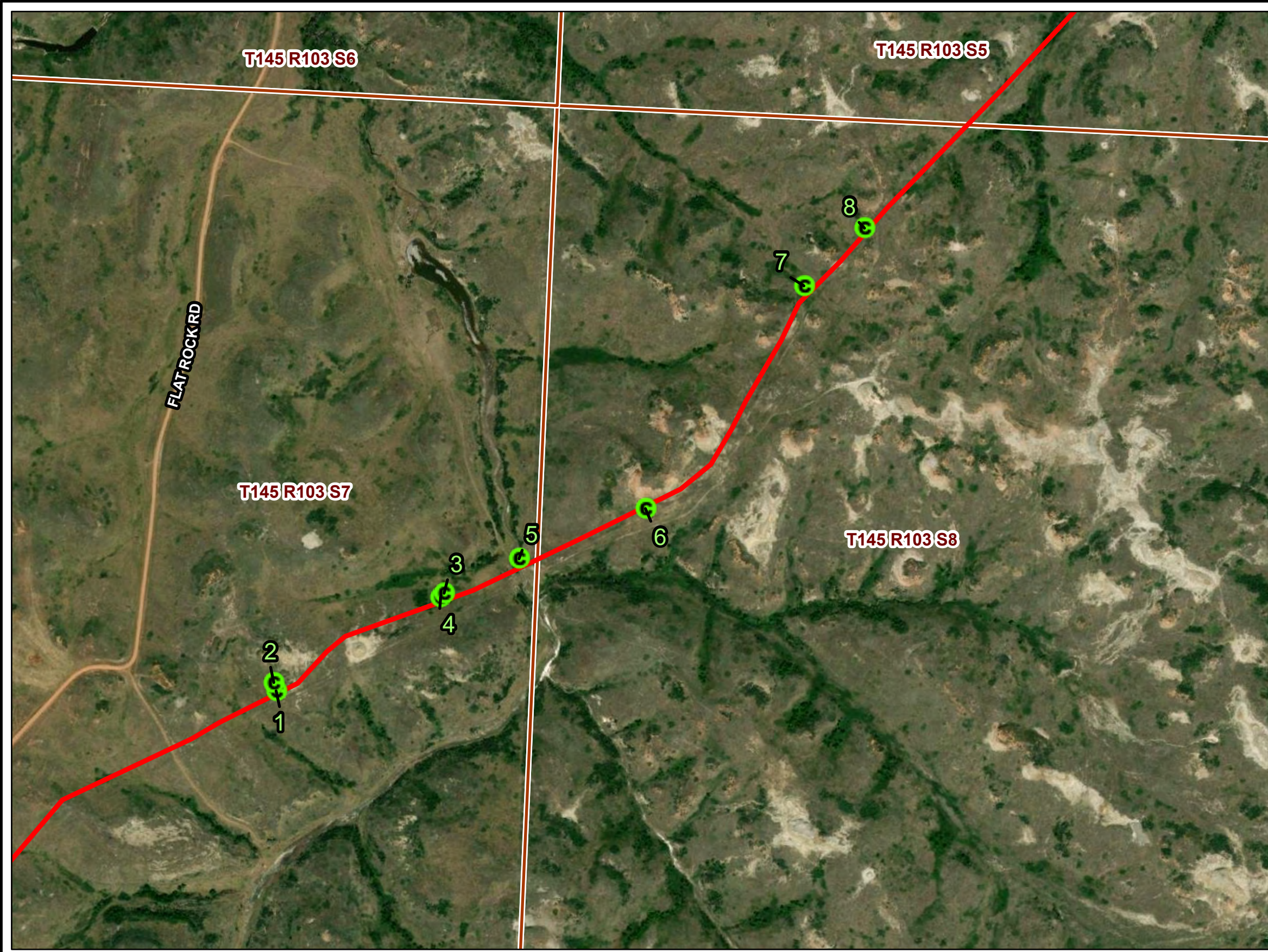
Figure 1-18: Construction Observation Locations Map

**Bridger Pipeline
Figure 1**

-  Construction Observation Point Location
-  Bridger Pipeline Centerline (PU-21-48)
-  Section Boundary



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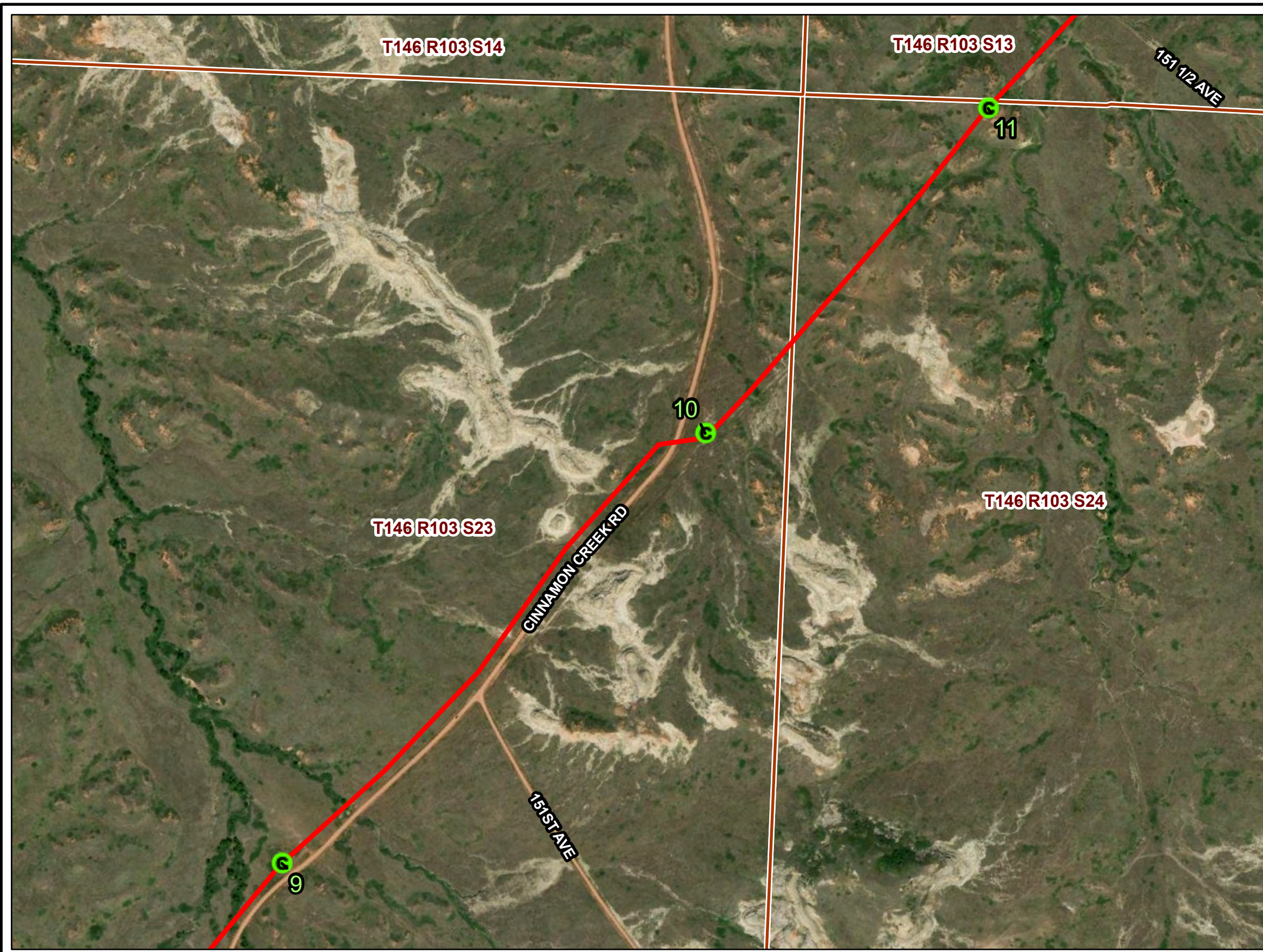
PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



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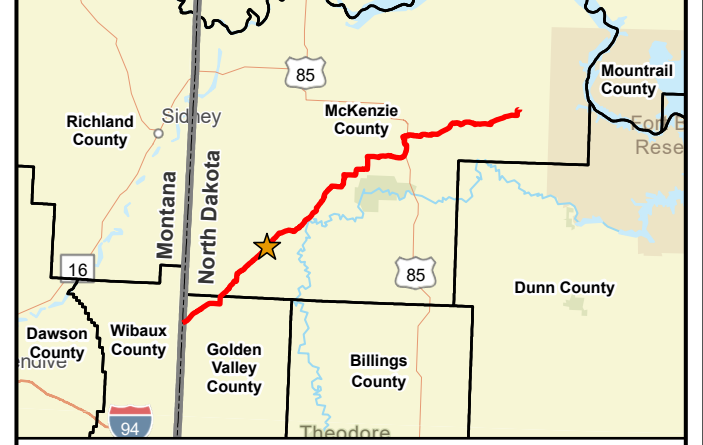
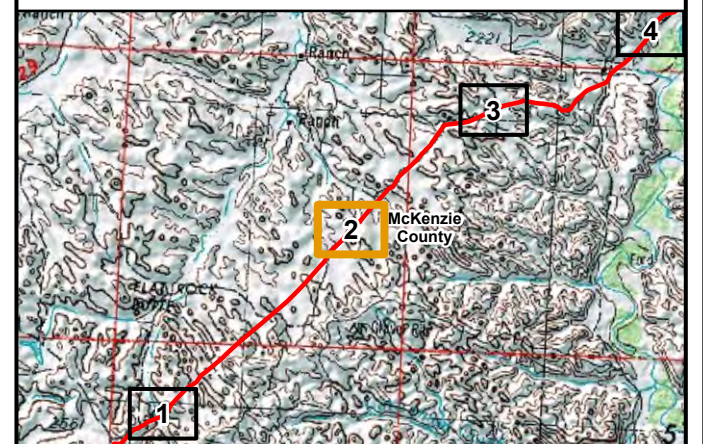
Map 1 of 18



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**Bridger Pipeline
Figure 2**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



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Feet

ESRI World Imagery

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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



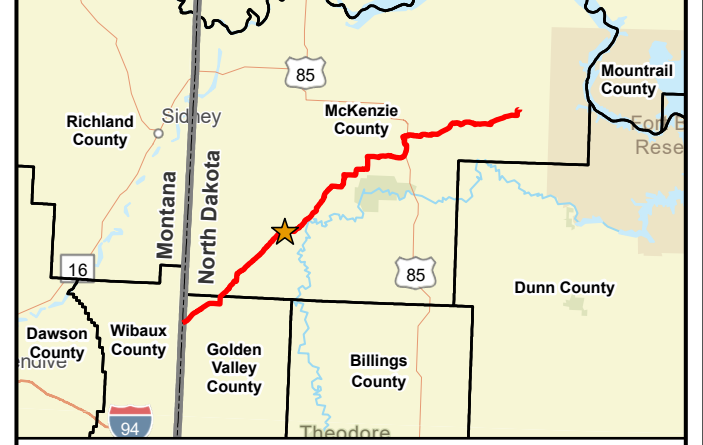
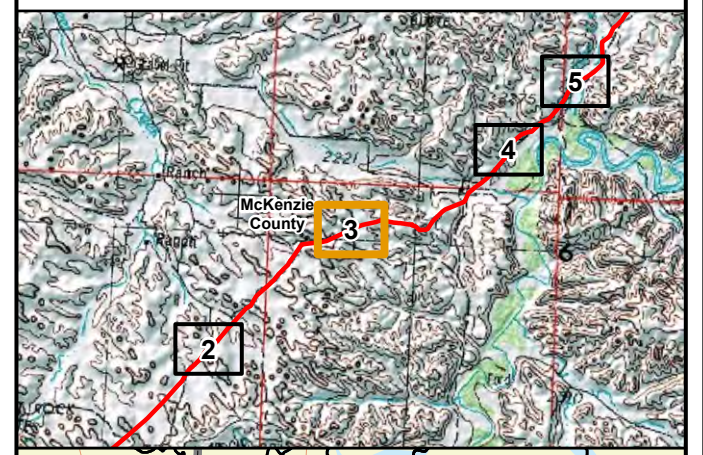
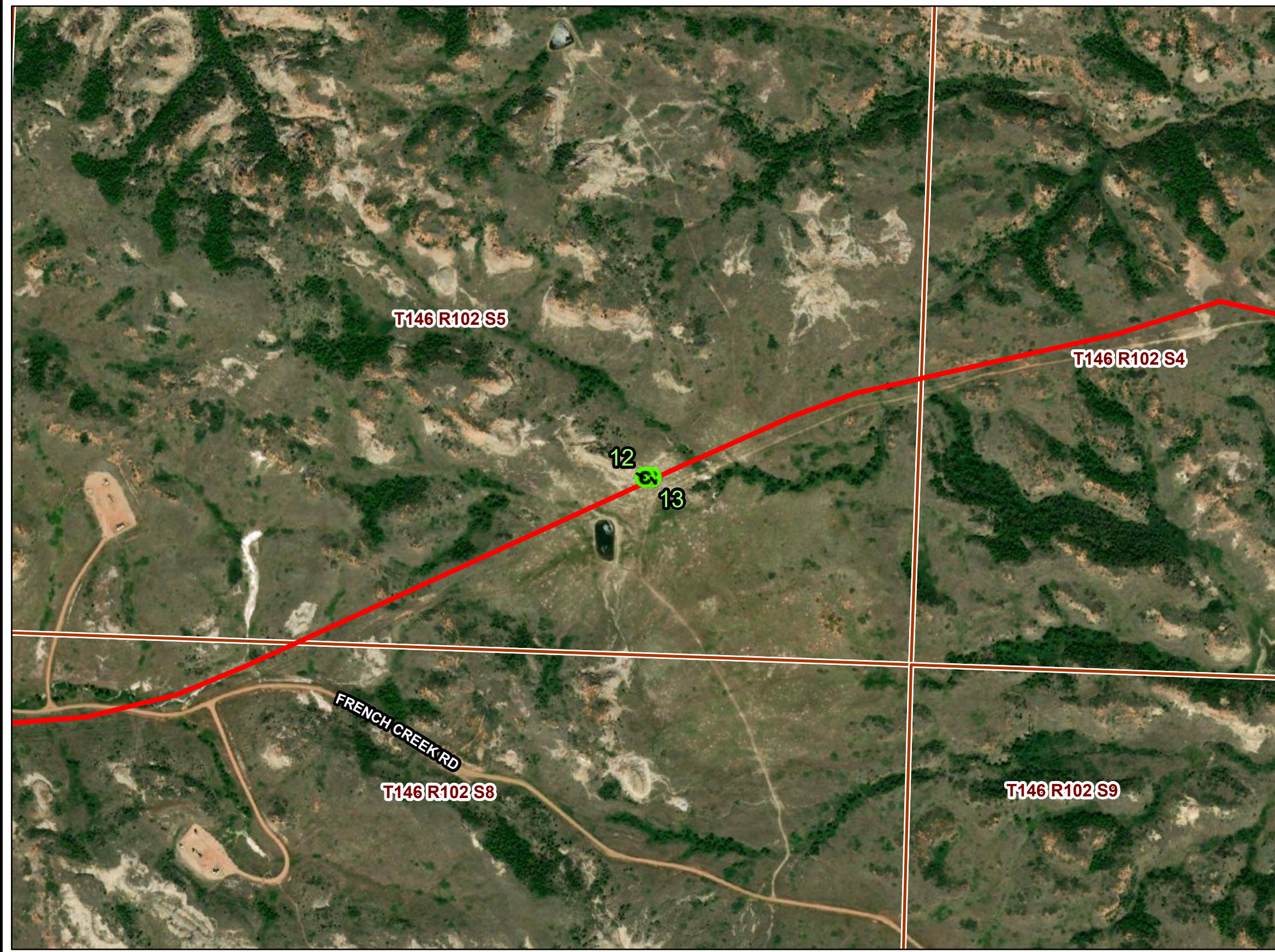
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Bridger Pipeline
Figure 3

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



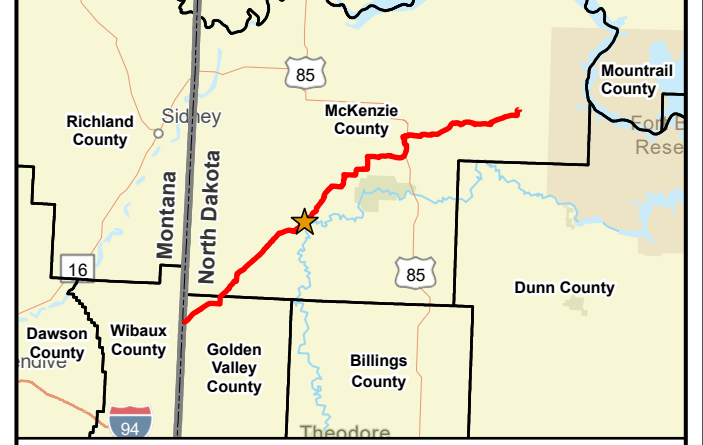
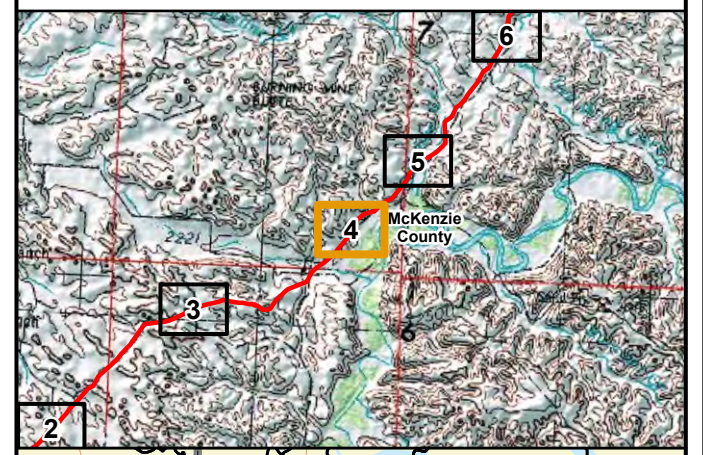
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Bridger Pipeline
Figure 4

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



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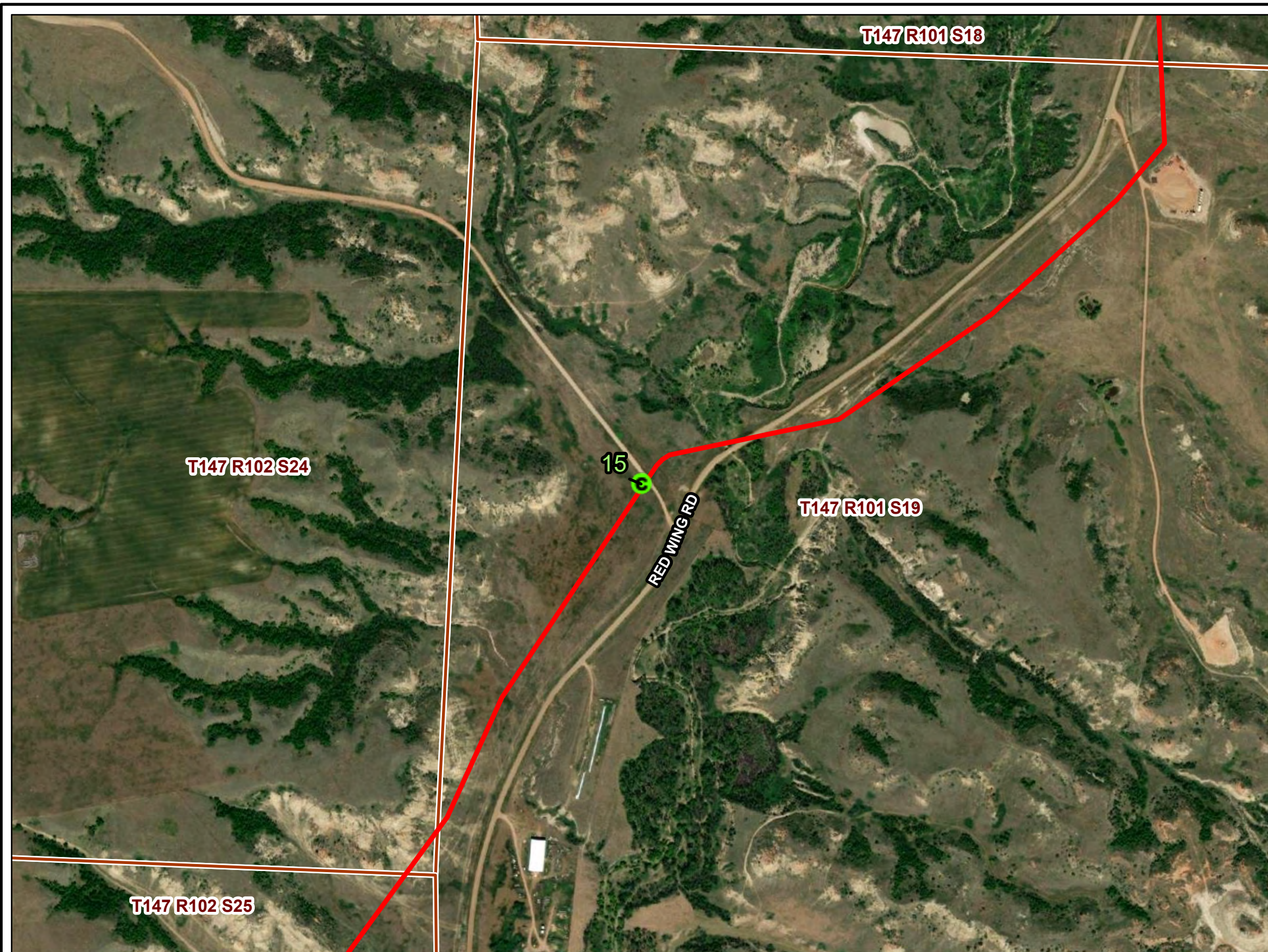
PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



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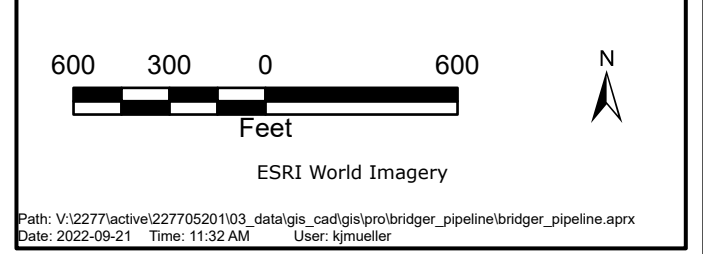
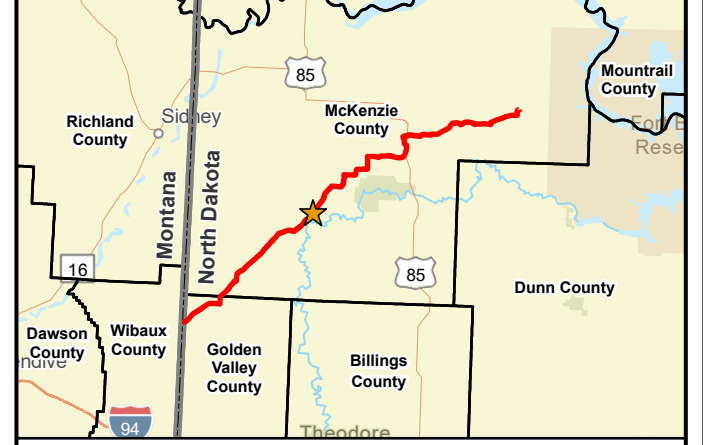
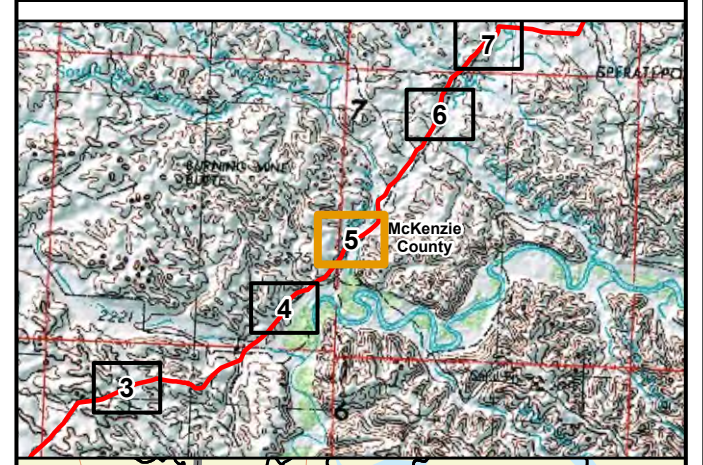
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**Bridger Pipeline
Figure 5**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION
Construction Observation Locations

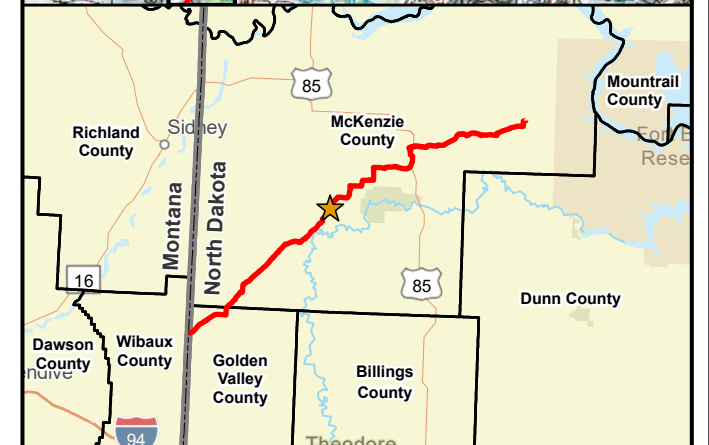
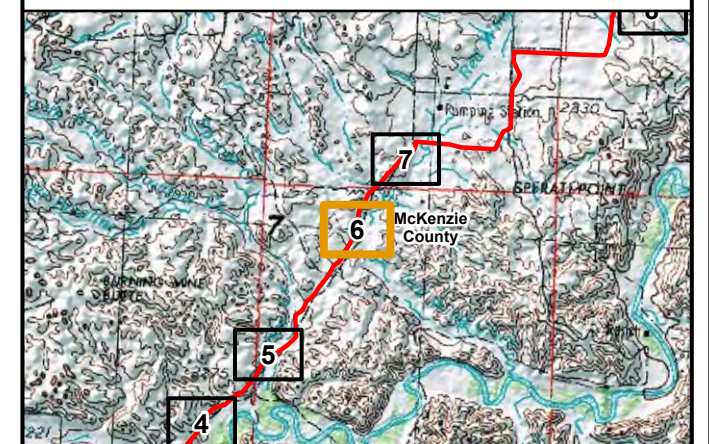


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Map 5 of 18

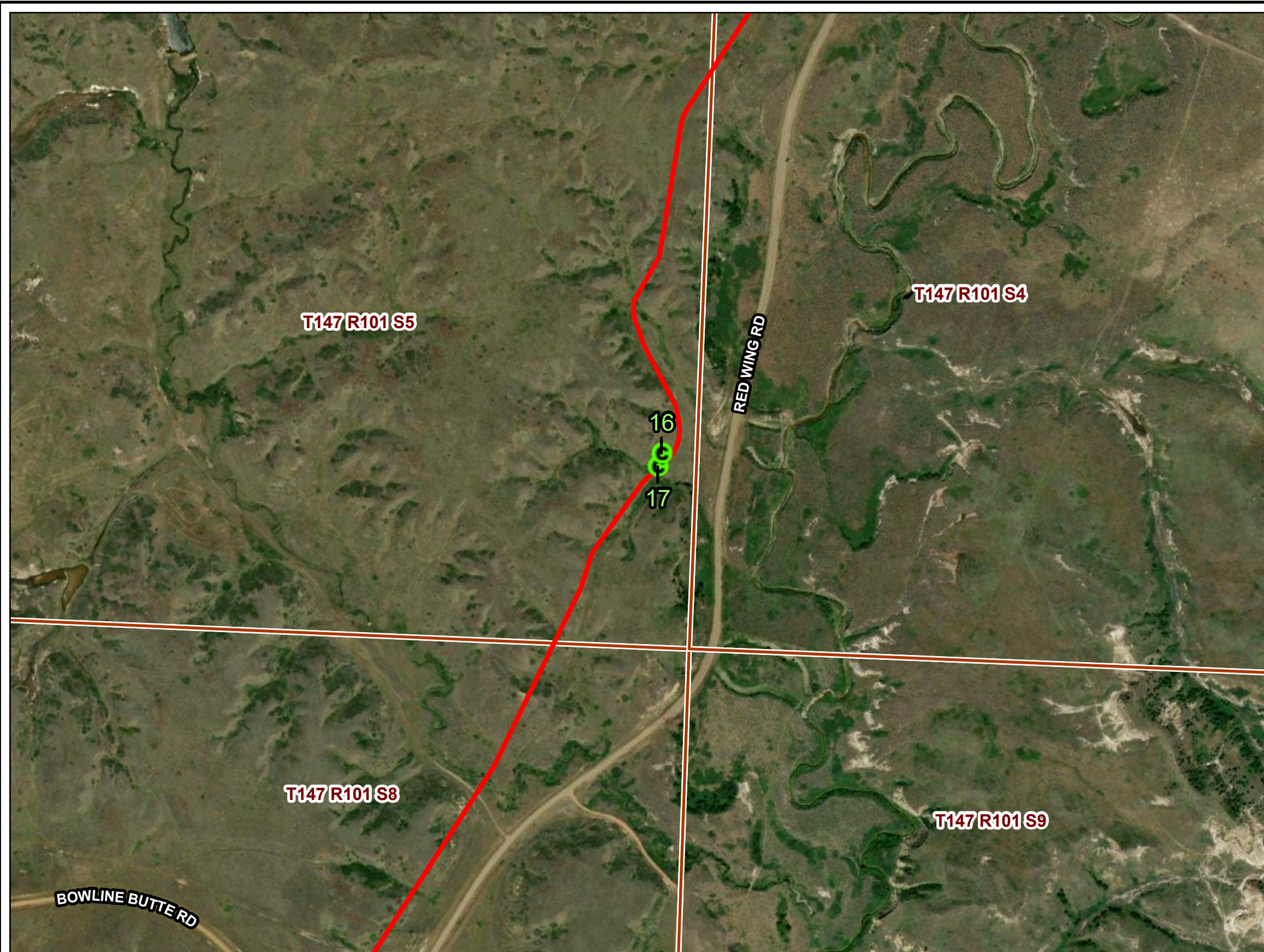
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Bridger Pipeline
Figure 6

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



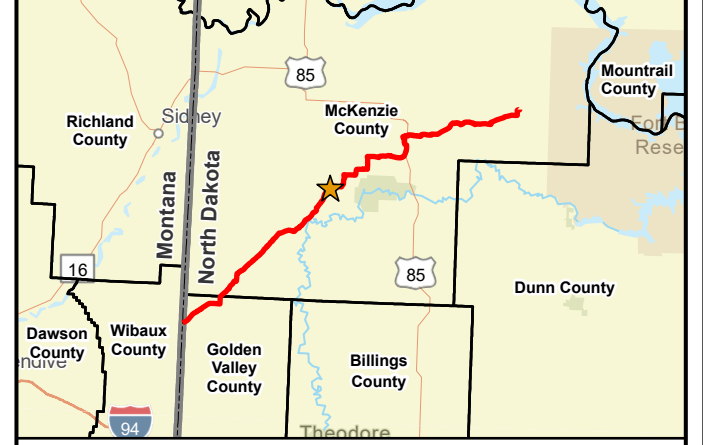
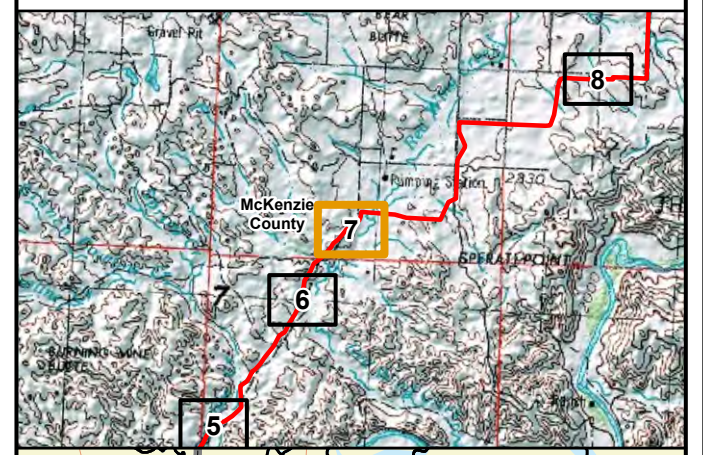
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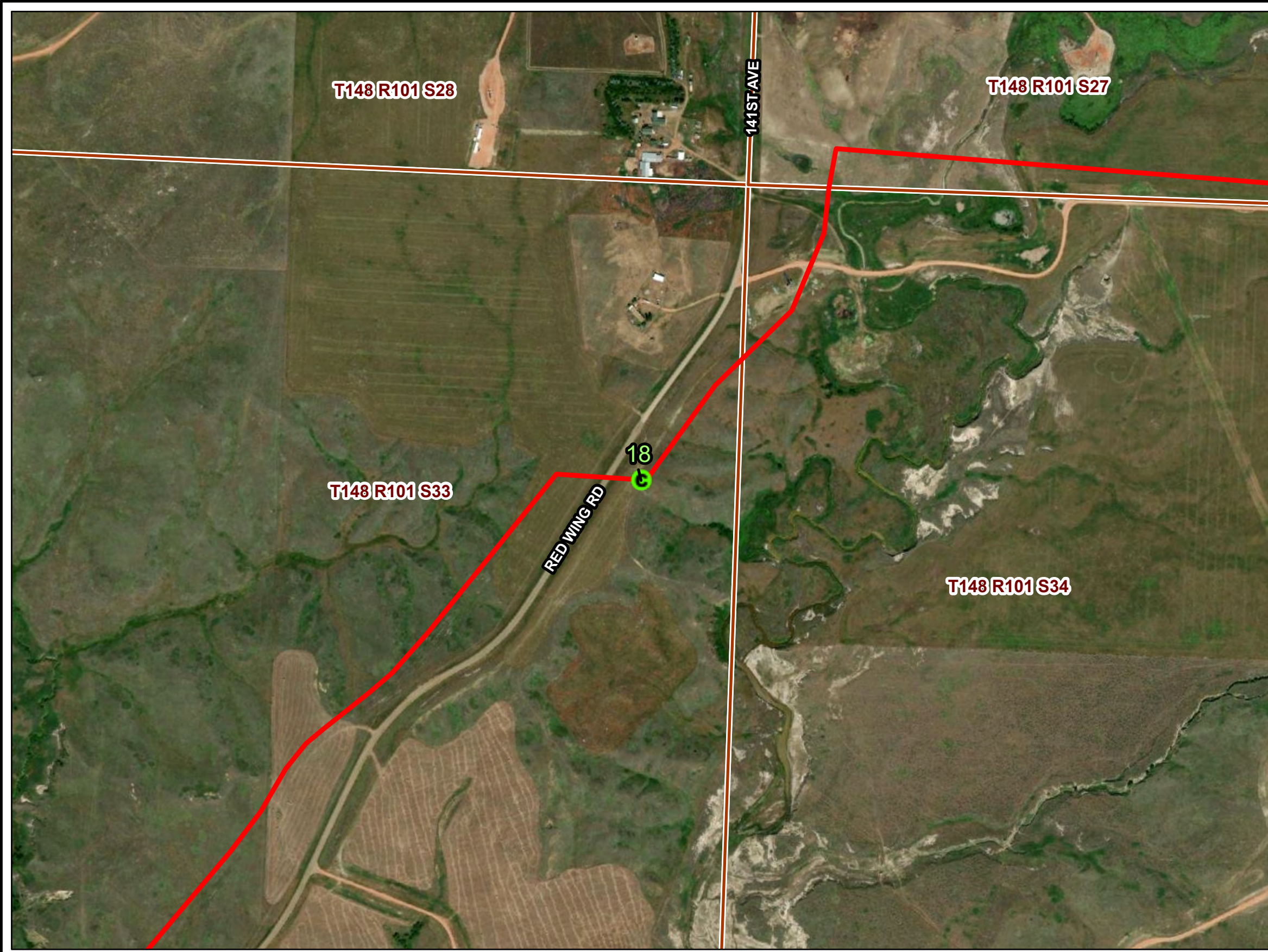
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Public Service Commission

Bridger Pipeline
Figure 7

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



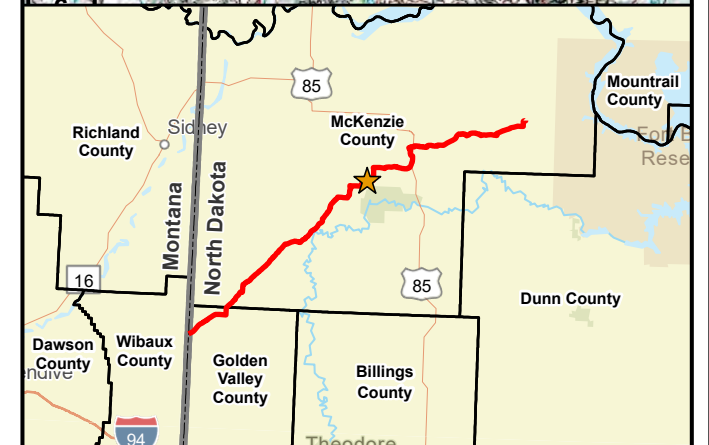
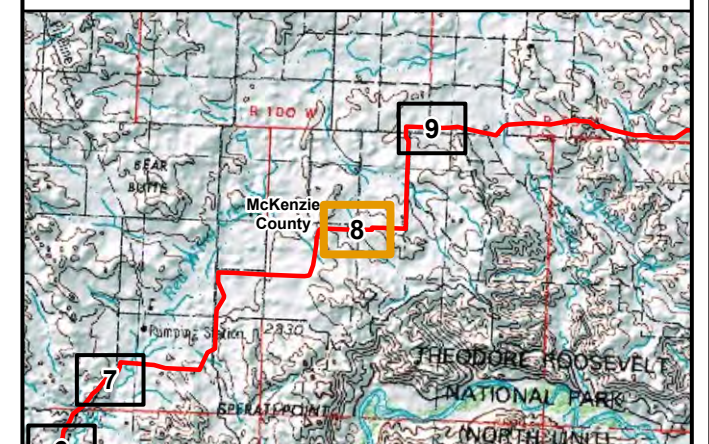
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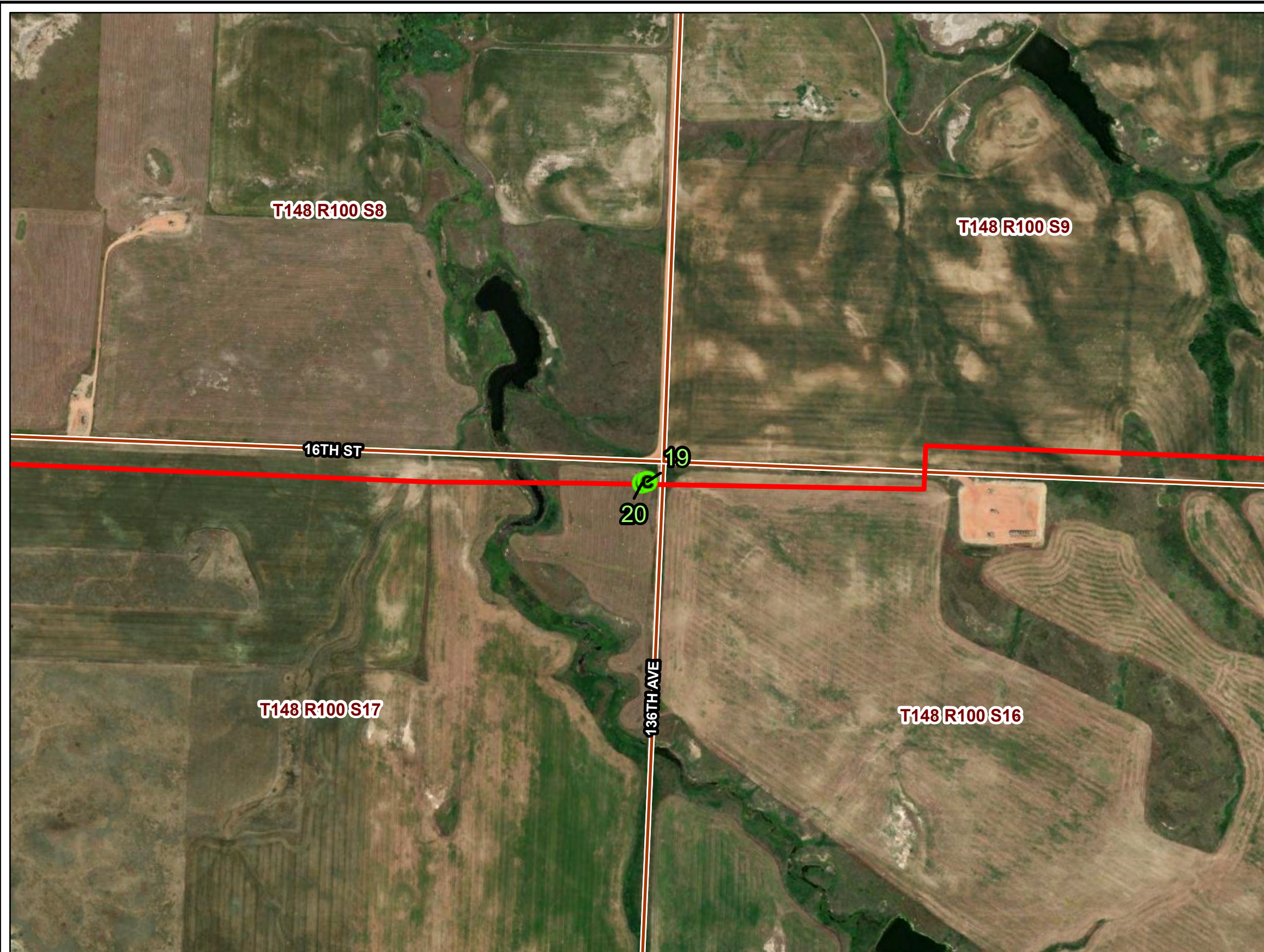
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Bridger Pipeline
Figure 8

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



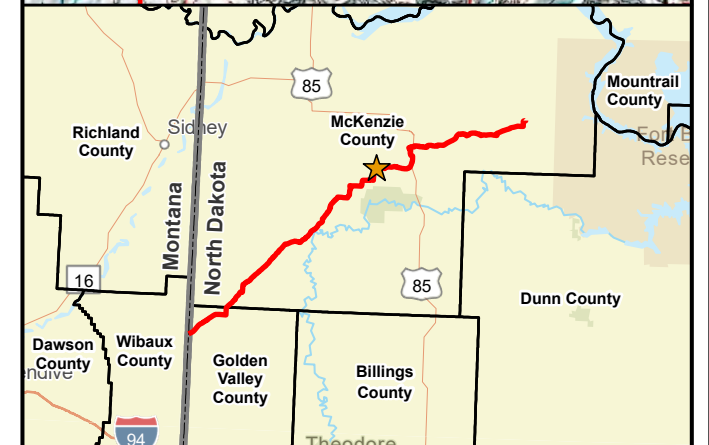
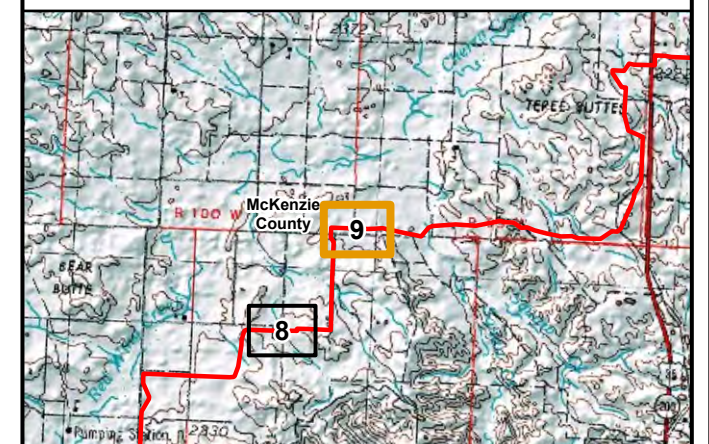
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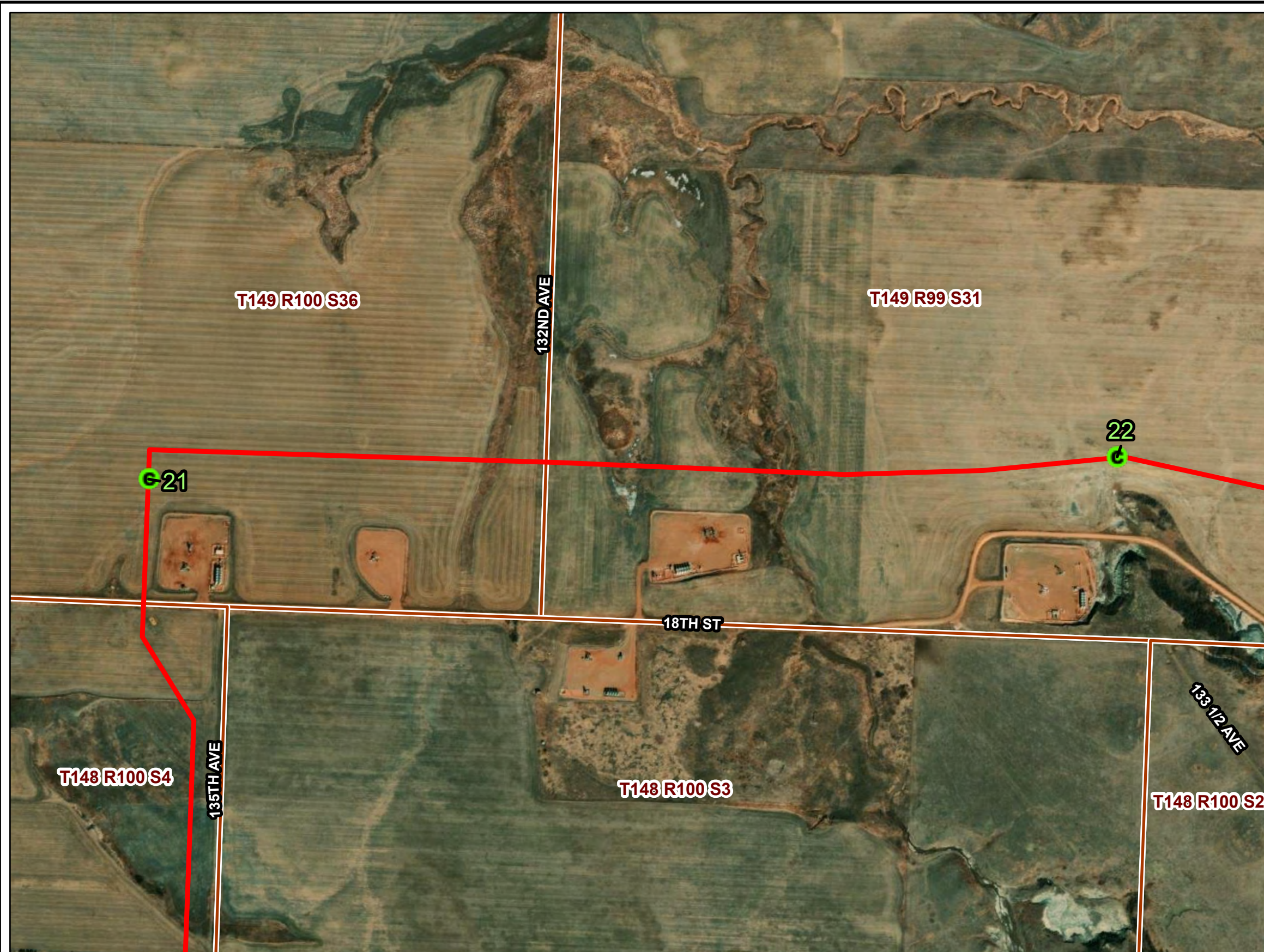
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Bridger Pipeline
Figure 9

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION




Construction Observation Locations

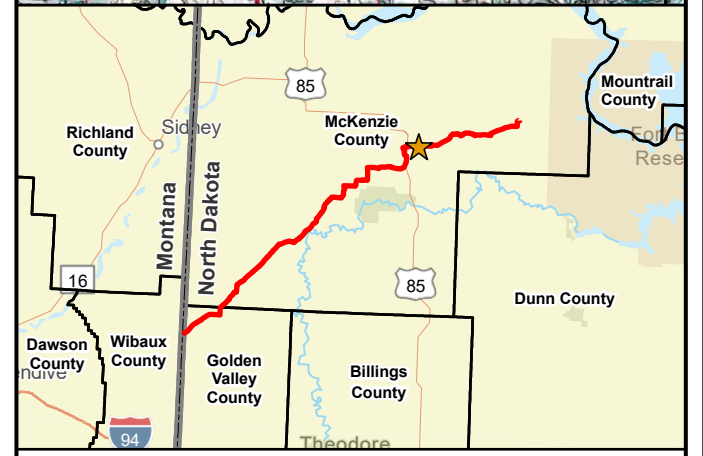
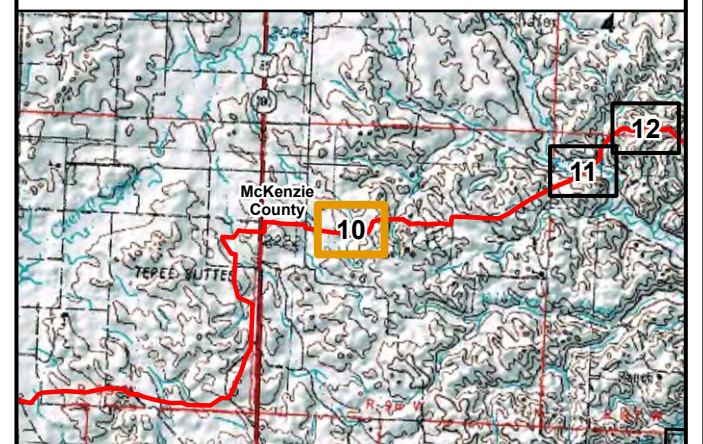


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**Bridger Pipeline
Figure 10**

-  Construction Observation Point Location
-  Bridger Pipeline Centerline (PU-21-48)
-  Section Boundary



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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations

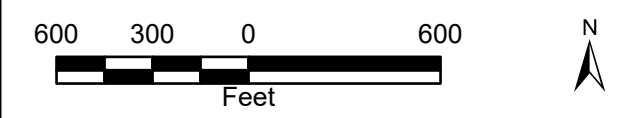
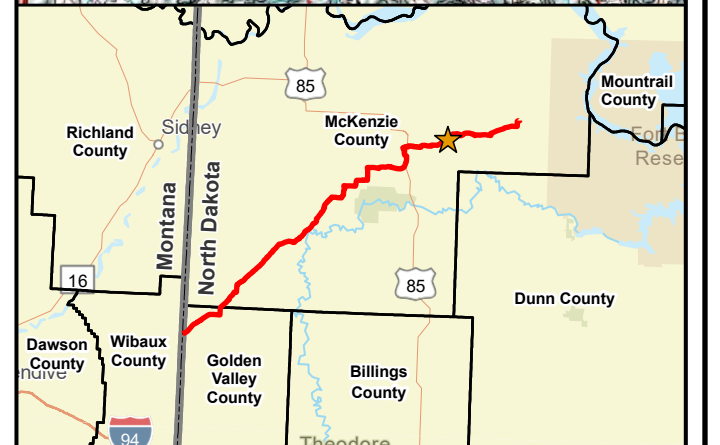
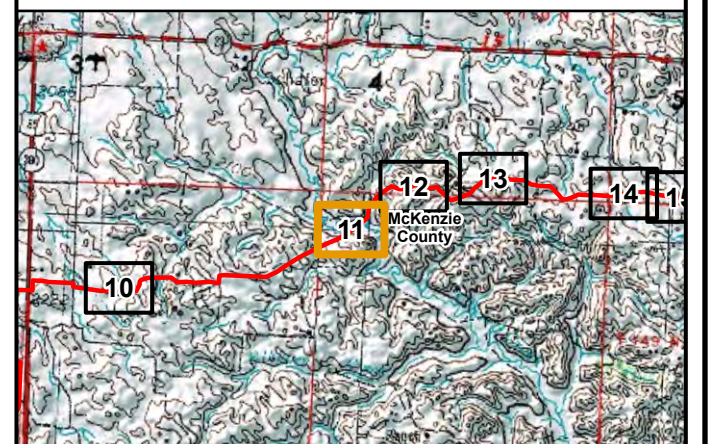


SEPT 2022

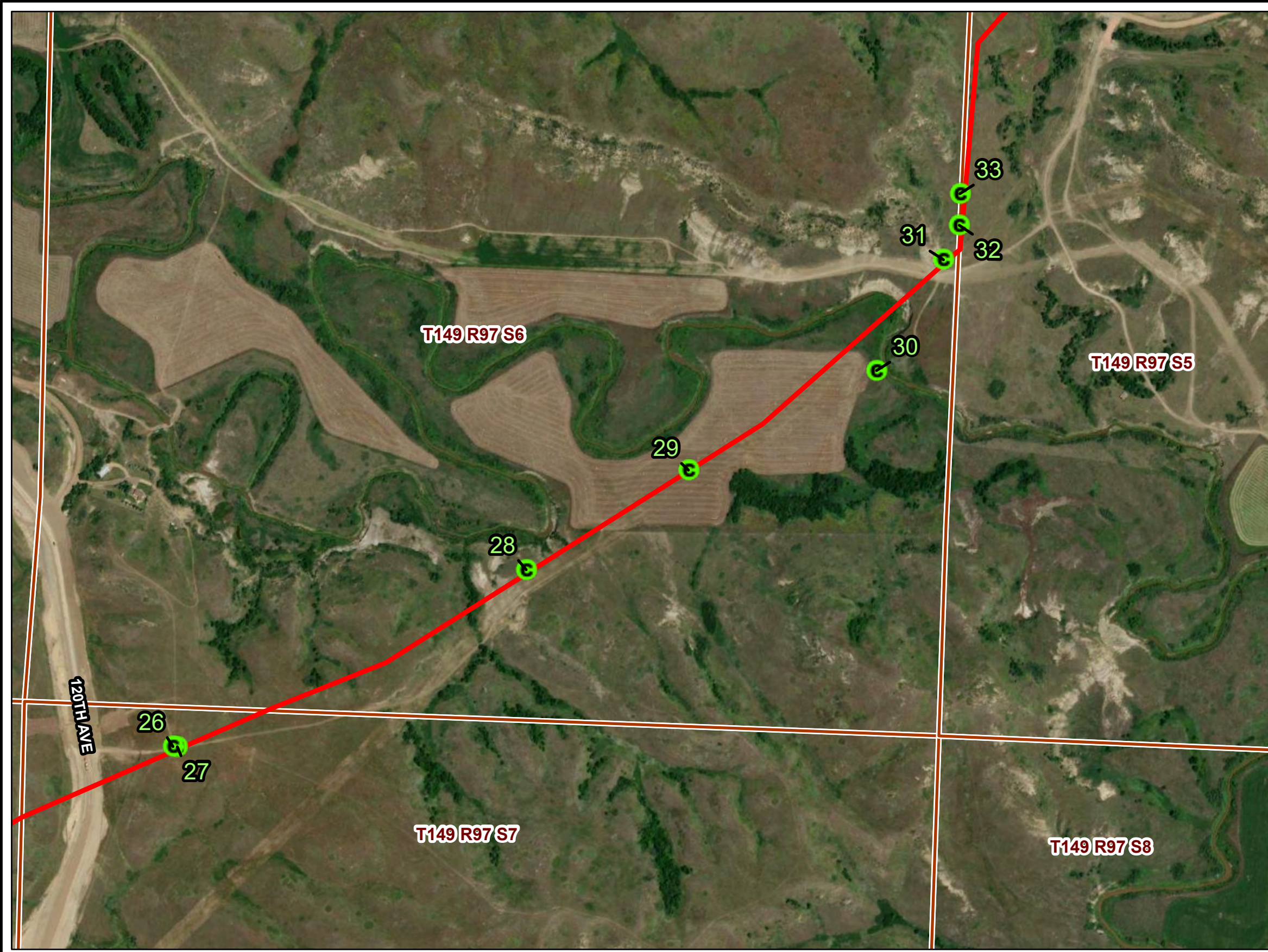
Map 10 of 18

**Bridger Pipeline
Figure 11**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



Path: V:\2277\active\227705201\03_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller



PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations

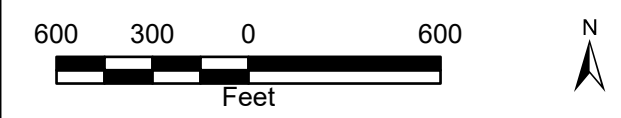
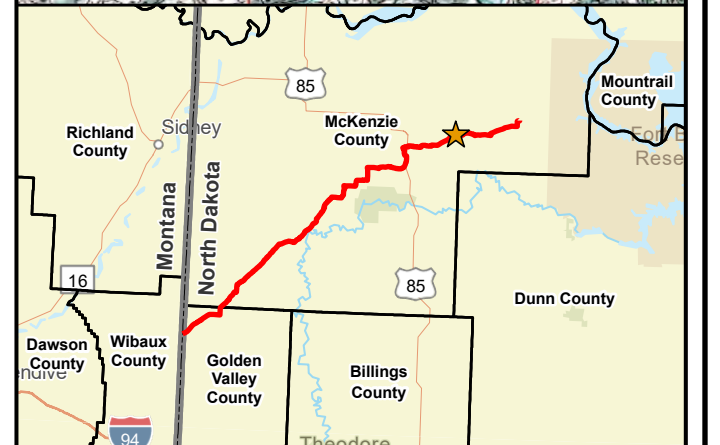
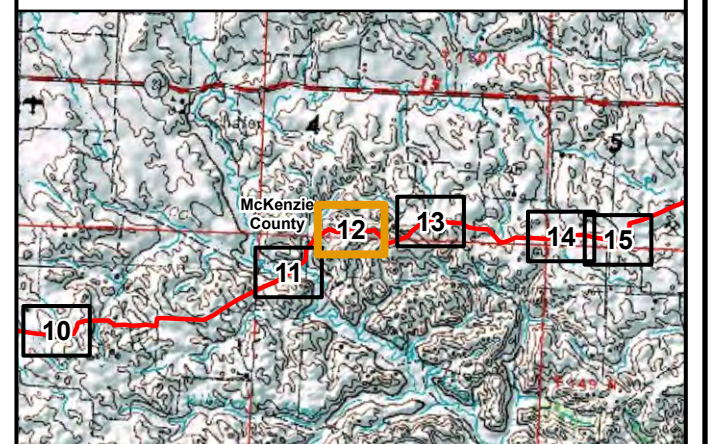
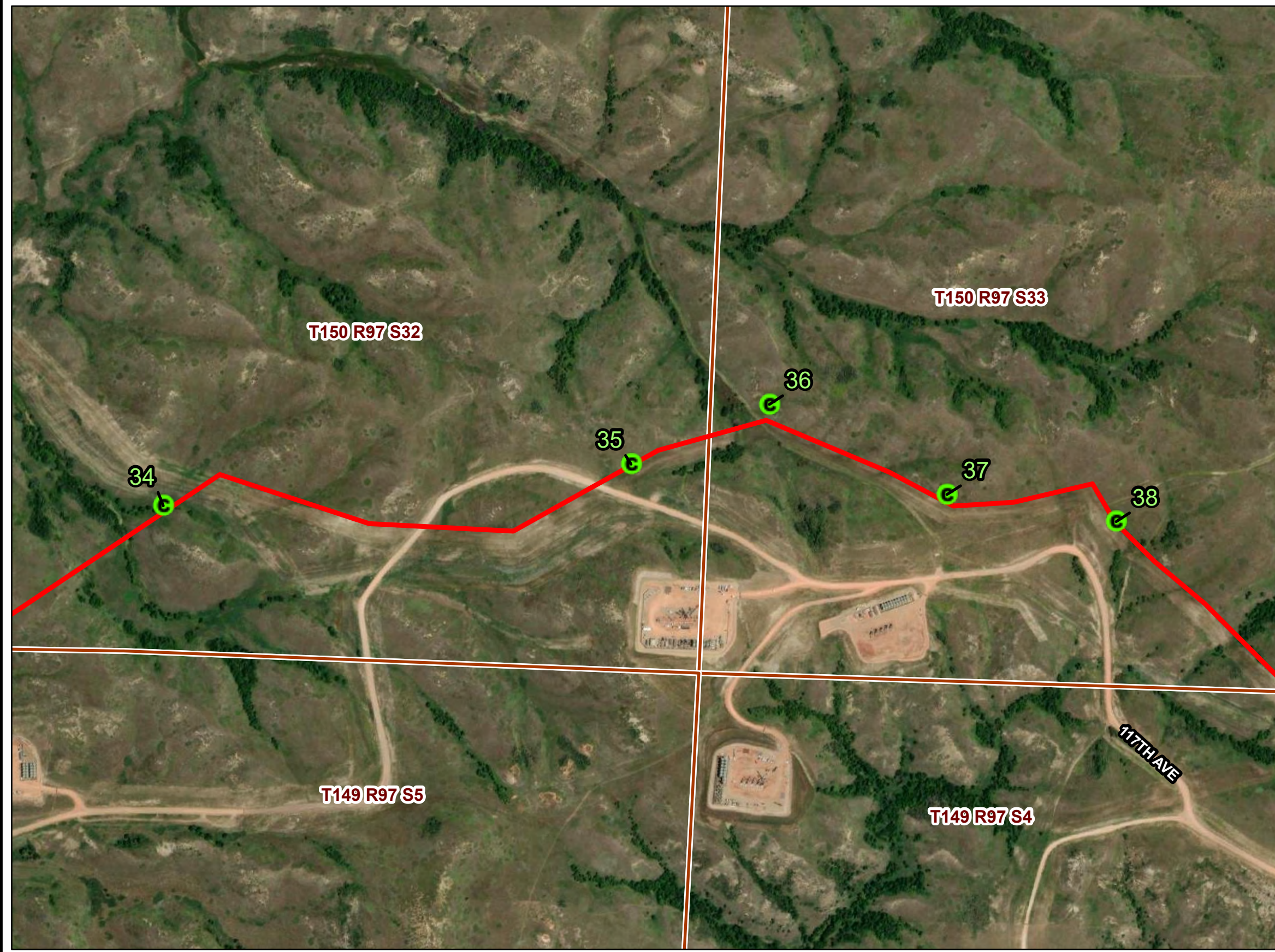


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Map 11 of 18

**Bridger Pipeline
Figure 12**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



ESRI World Imagery
Path: V:\2277\active\22770520\103_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller

PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



SEPT 2022

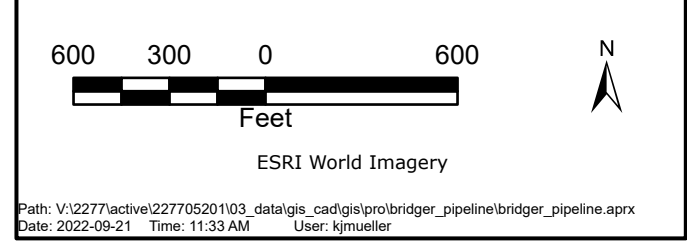
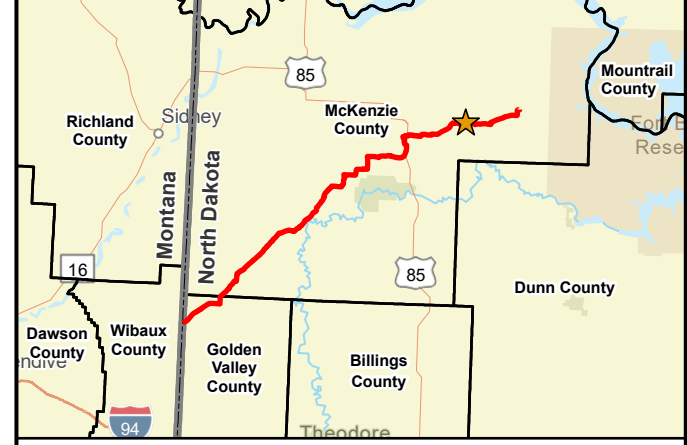
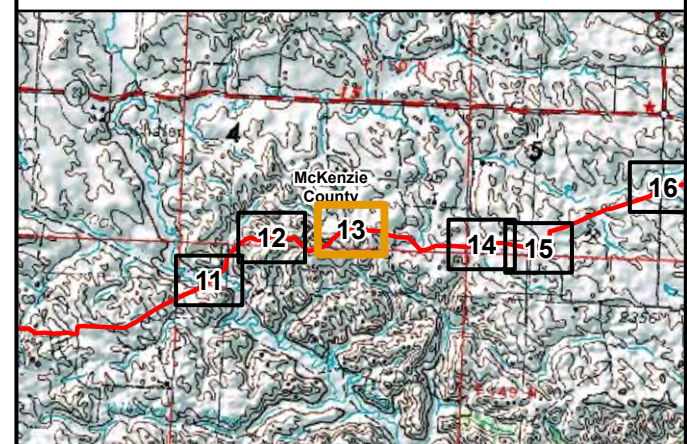
Map 12 of 18



**North Dakota
Public Service Commission**

**Bridger Pipeline
Figure 13**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



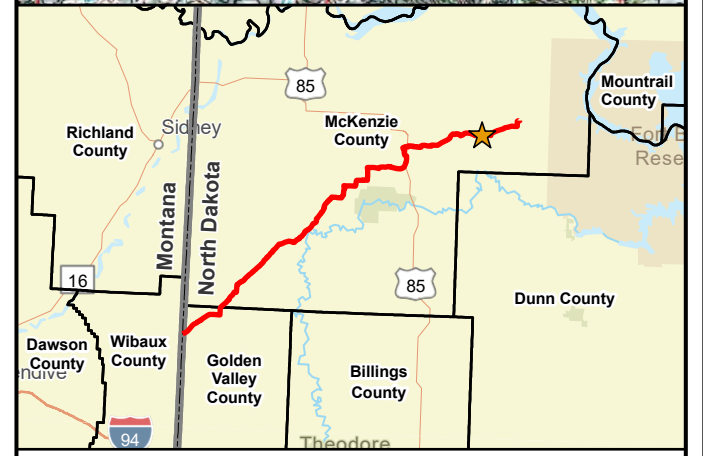
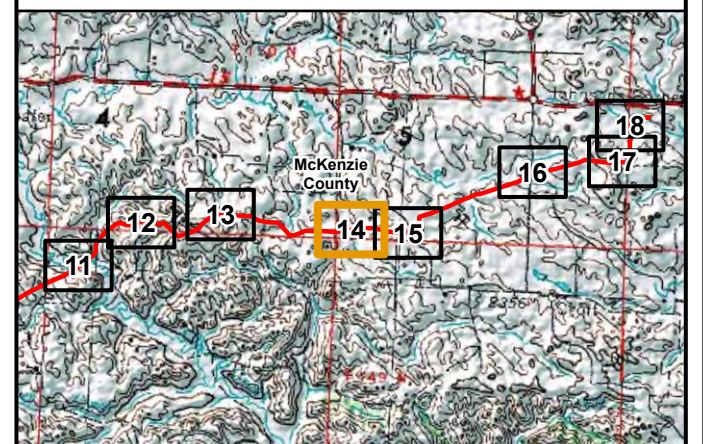
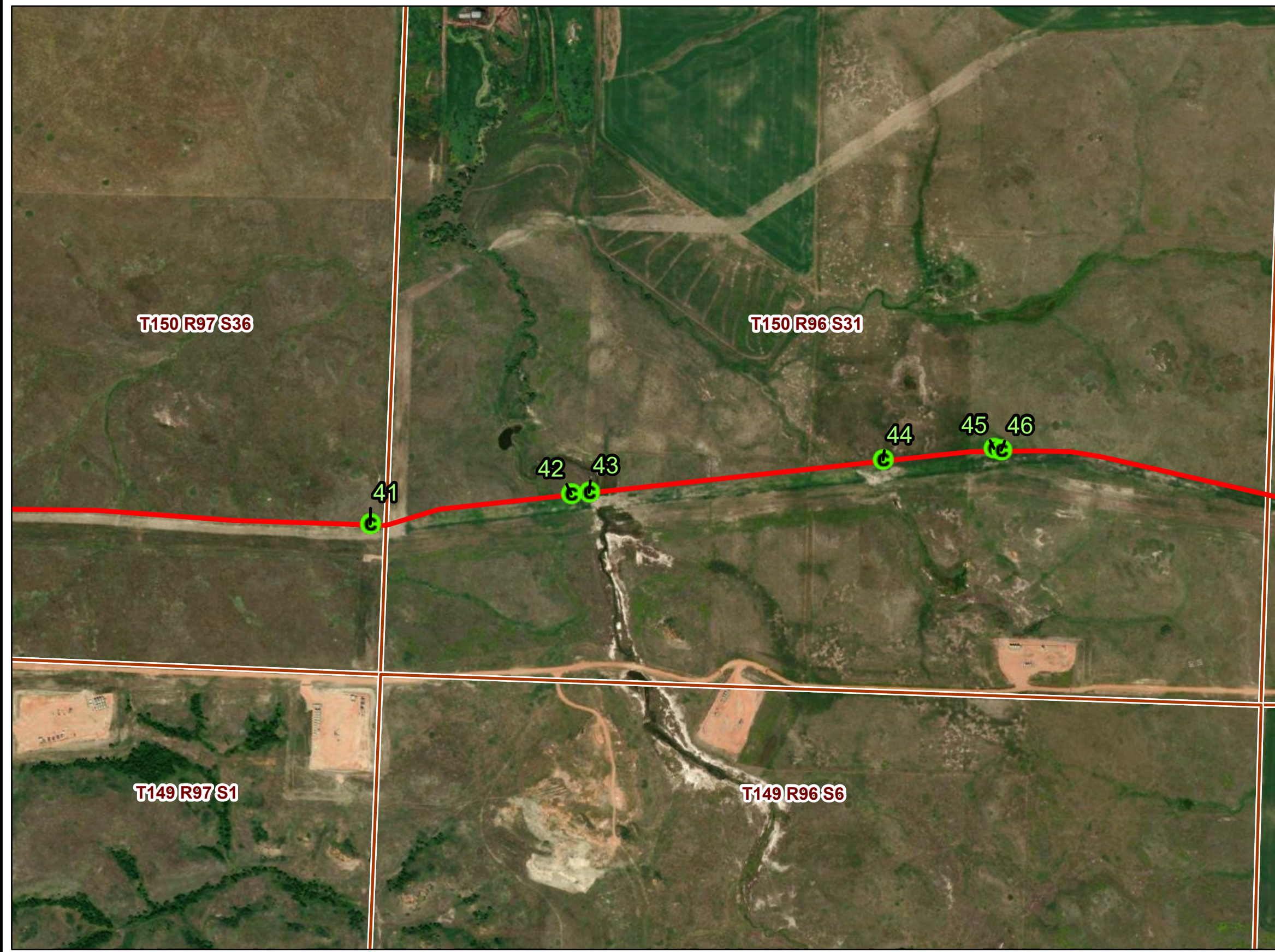
PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION
Construction Observation Locations



SEPT 2022
Map 13 of 18

**Bridger Pipeline
Figure 14**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- ▭ Section Boundary



ESRI World Imagery
Path: V:\2277\active\227705201\03_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller

PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations

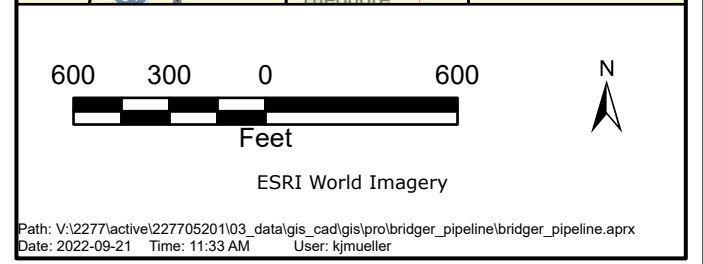
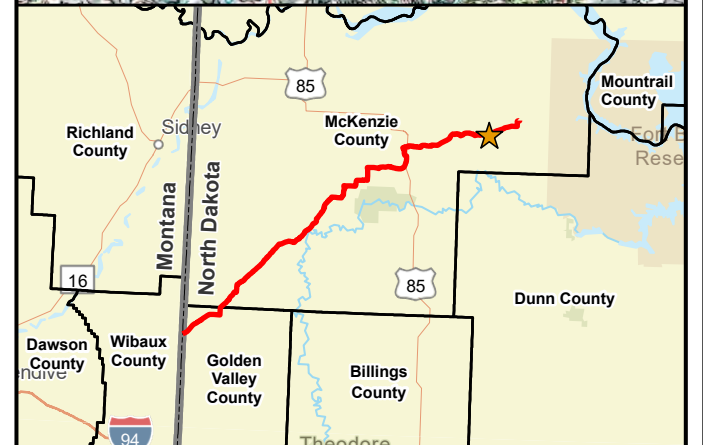
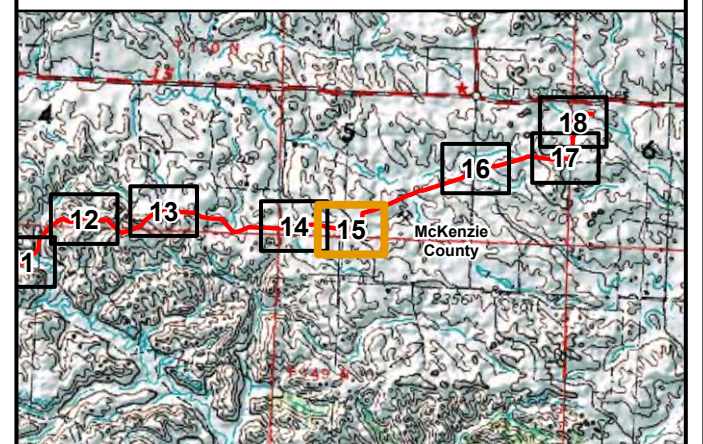


SEPT 2022

Map 14 of 18

**Bridger Pipeline
Figure 15**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



Path: V:\2277\active\227705201\03_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller



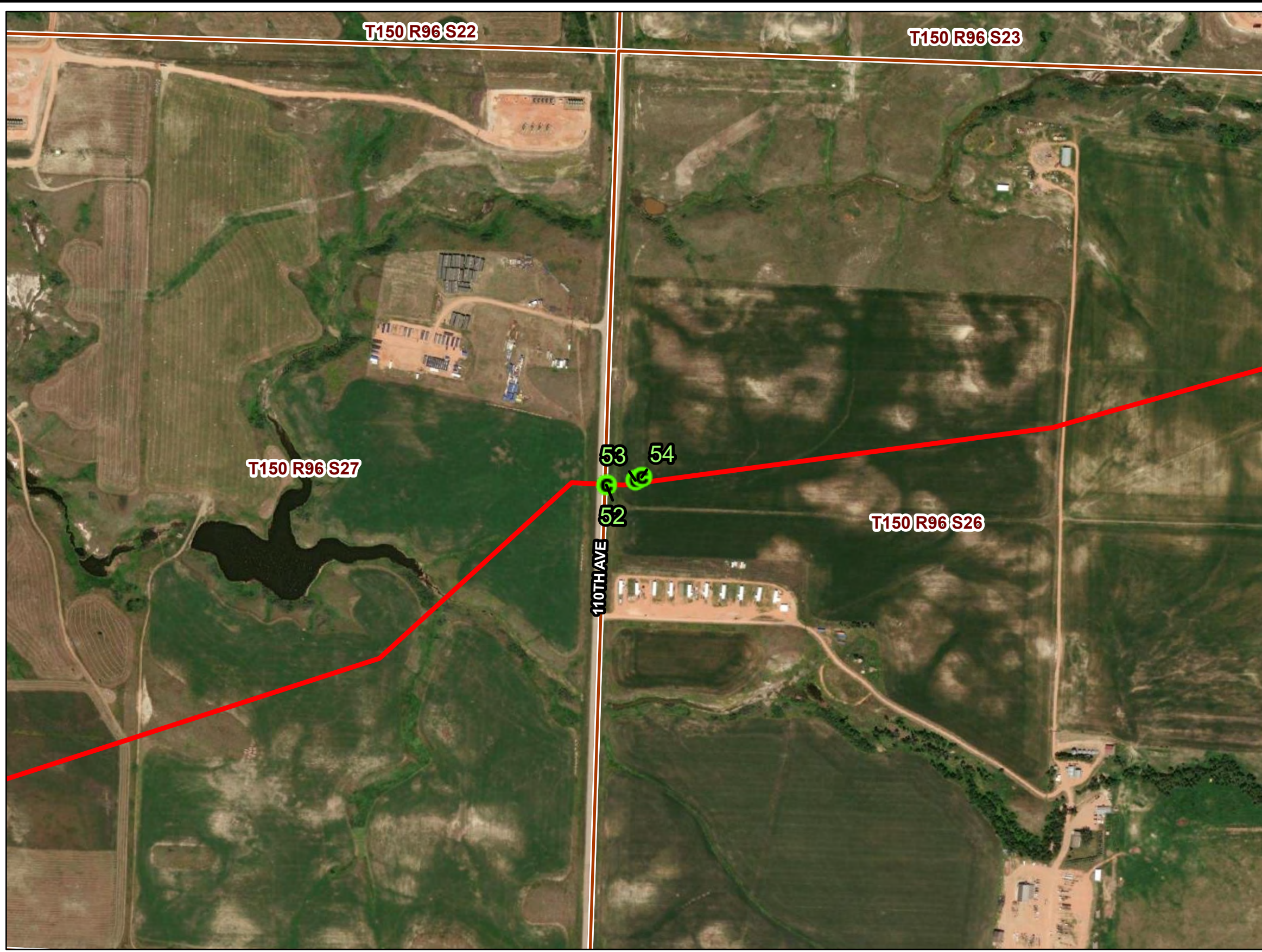
PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



SEPT 2022

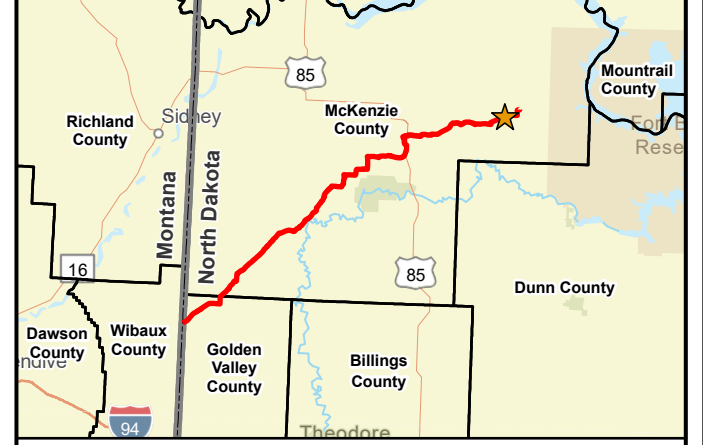
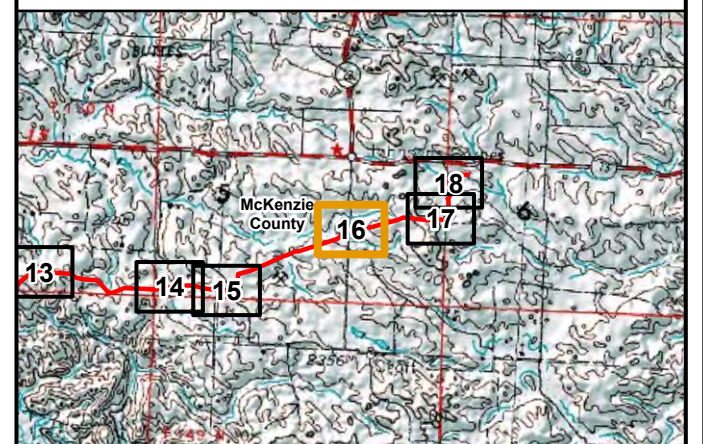
Map 15 of 18



**North Dakota
Public Service Commission**

**Bridger Pipeline
Figure 16**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



600 300 0 600
Feet

ESRI World Imagery

Path: V:\2277\active\22770520\103_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller

PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



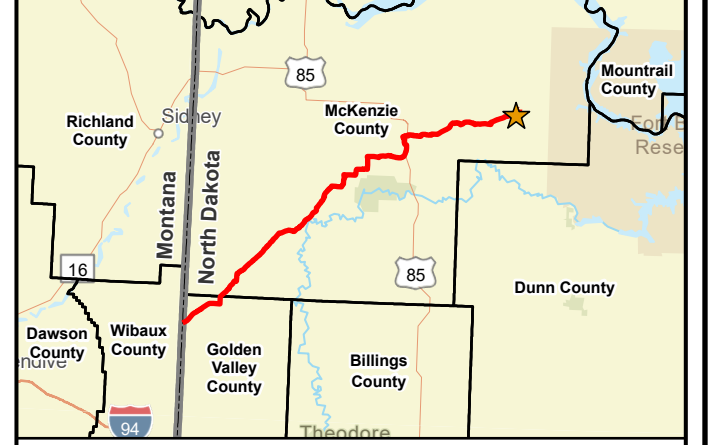
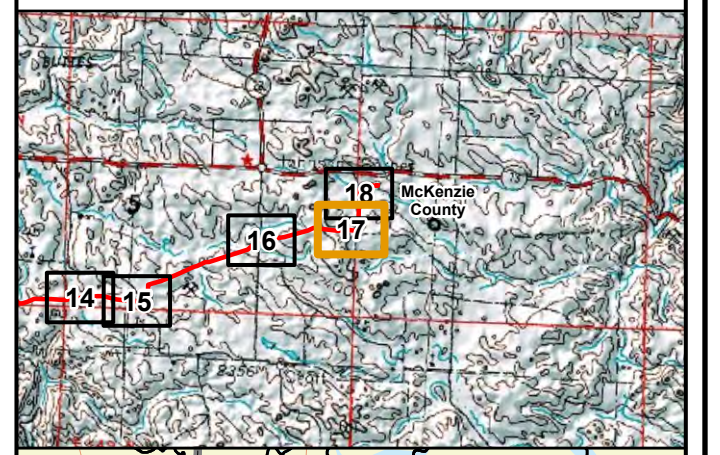
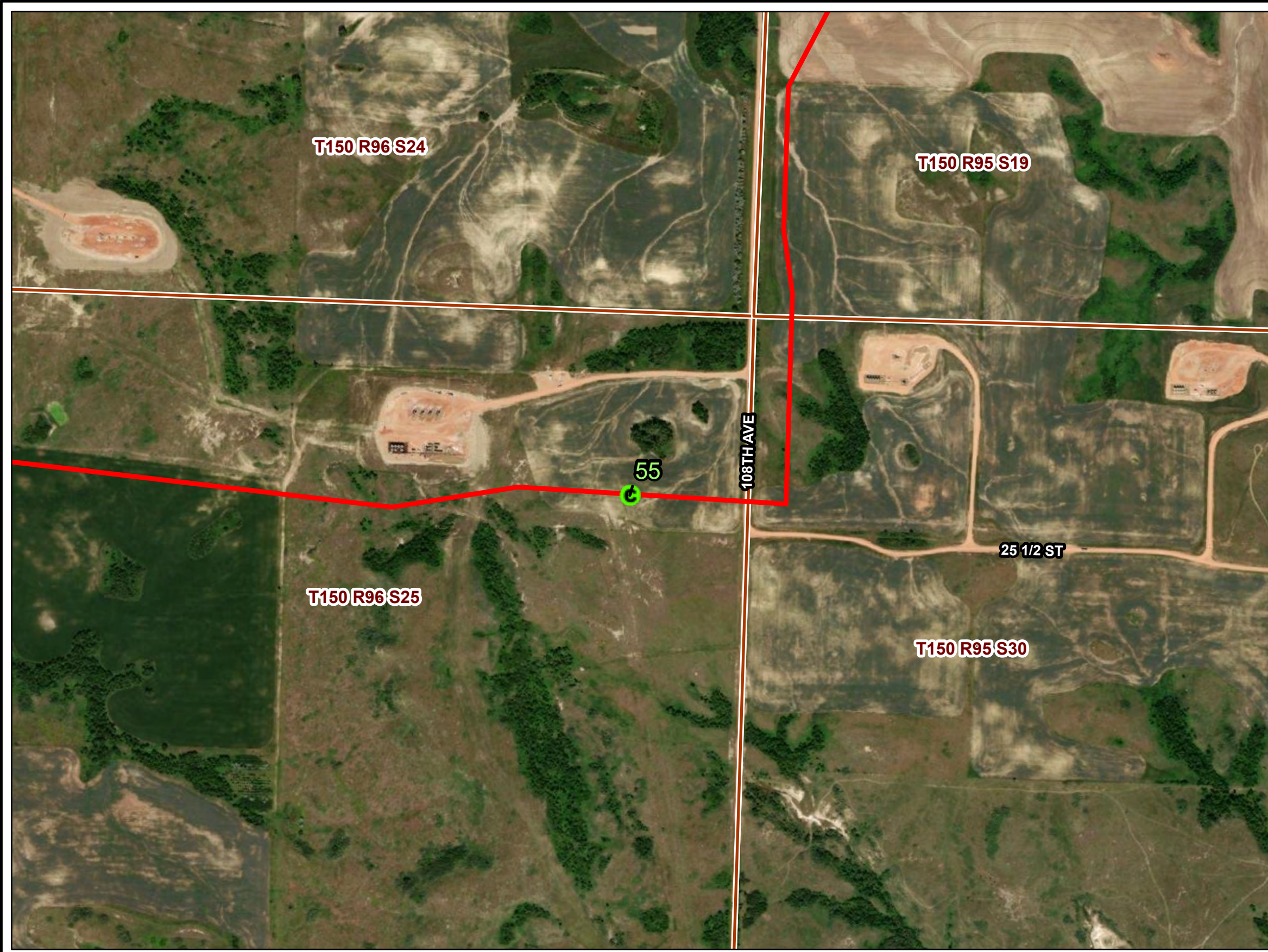
SEPT 2022

Map 16 of 18

**North Dakota
Public Service Commission**

**Bridger Pipeline
Figure 17**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



Path: V:\2277\active\22770520\103_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
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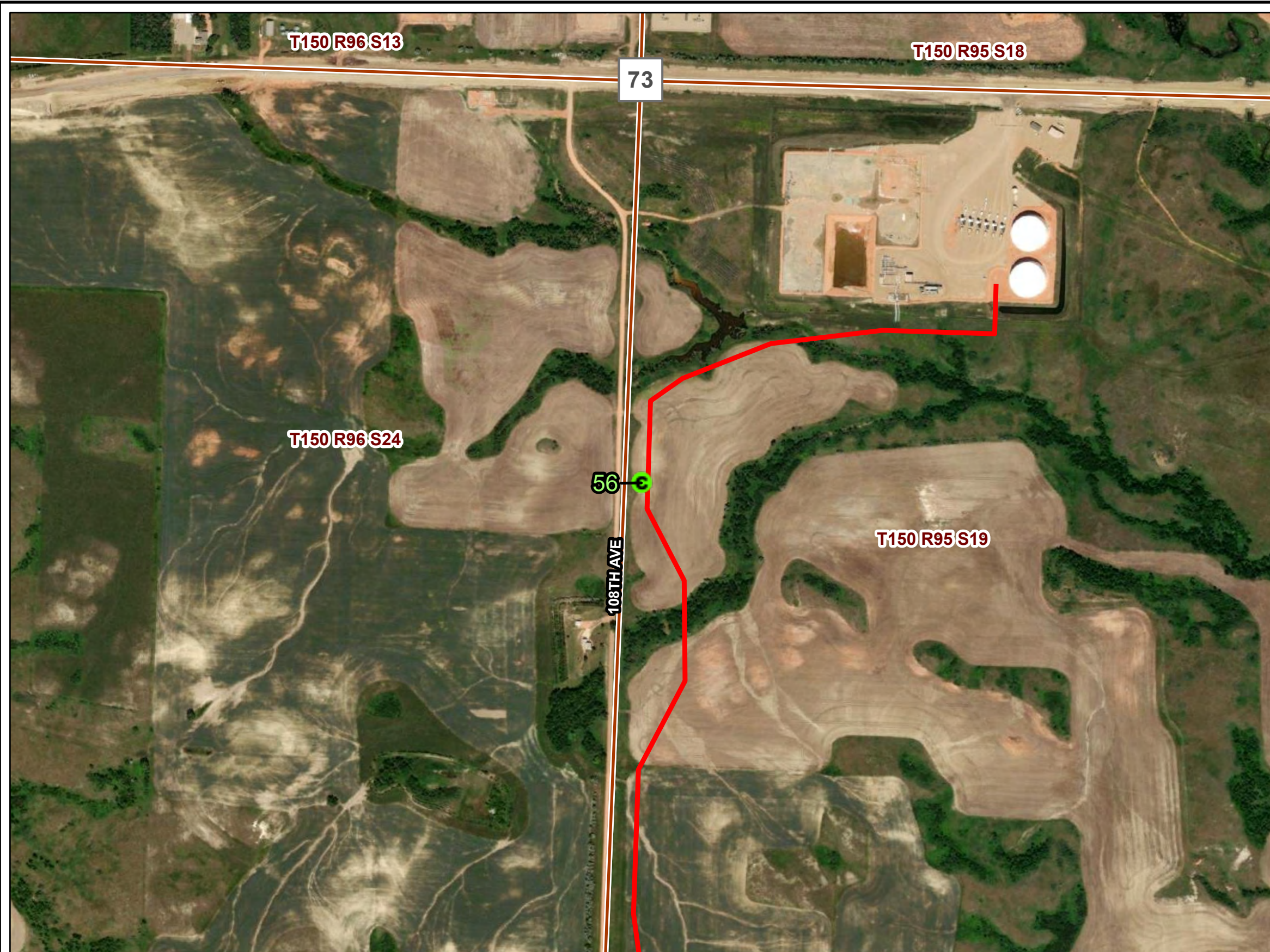
PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



SEPT 2022

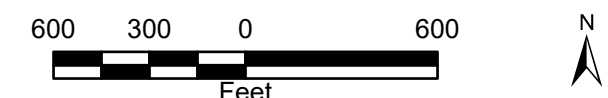
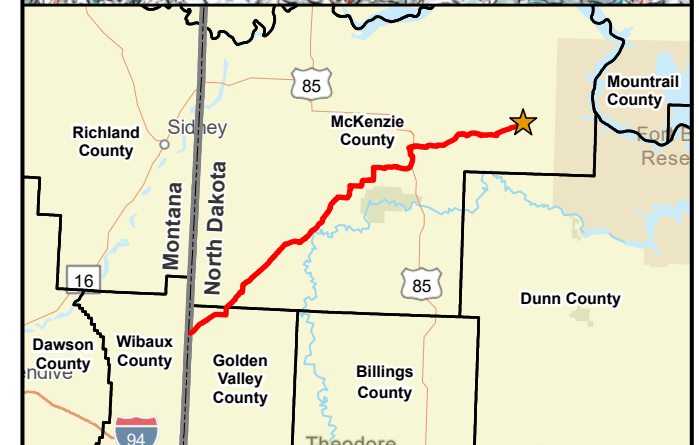
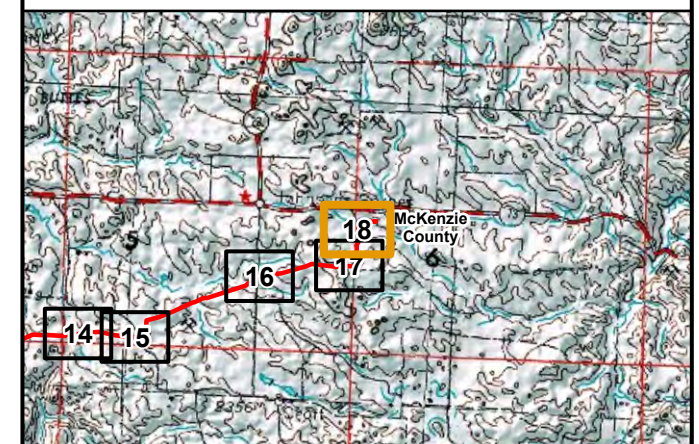
Map 17 of 18



**North Dakota
Public Service Commission**

**Bridger Pipeline
Figure 18**

- Construction Observation Point Location
- Bridger Pipeline Centerline (PU-21-48)
- Section Boundary



Path: V:\2277\active\22770520\103_data\gis_cad\gis\proj\bridger_pipeline\bridger_pipeline.aprx
Date: 2022-09-21 Time: 11:33 AM User: kjmueller

PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Construction Observation Locations



SEPT 2022

Map 18 of 18

APPENDIX A

Observation Point Photolog

PU-21-048: Observation Point Photolog



Observation Point: 1

Date Taken: September 15, 2022

Direction Photo is Taken: South

Spread: Loenbro

Photo Description: Right of way aligns with shape file. No trench to confirm pipe depth.

Latitude: 47.3925514

Longitude: -103.84851331



Observation Point: 2

Date Taken: September 15, 2022

Direction Photo is Taken: South

Spread: Loenbro

Photo Description: Topsoil and subsoil piles separated. No signs of erosion.

Latitude: 47.39268207

Longitude: -103.84857845



Observation Point: 3

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Trees and stumps cleared. Subsoils is stockpiled on/next to topsoil. Likely will result in minor mixing when backfilling.

Latitude: 47.39420687

Longitude: -103.84471314

PU-21-048: Observation Point Photolog



Observation Point: 4

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Open cut side slope.

Latitude: 47.39414085

Longitude: -103.84479281



Observation Point: 5

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Topsoil stockpile has no erosion prevention methods used and loose soil entering stream. Silt fences are used on other parts of the ROW, but not at this point where erosion is occurring.

Latitude: 47.39480327

Longitude: -103.84301044

PU-21-048: Observation Point Photolog



Observation Point: 6 (Photo 1)

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: The side slope cut has not yet been trenched. Topsoil is stockpiled above the subsoil, upslope in the right of way. Subsoil is stockpiled also to downgrade side.

Latitude: 47.39568115

Longitude: -103.84012554



Observation Point: 6 (Photo 2)

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: The side slope cut has not been trenched. Topsoil is stockpiled above the subsoil, upslope in the right of way. Subsoil is stockpiled also to downgrade side.

Latitude: 47.39568115

Longitude: -103.84012554



Observation Point: 7

Date Taken: September 15, 2022

Direction Photo is Taken: Southwest

Spread: Loenbro

Photo Description: Overlapping edges of stockpiles. No subsoil mixed in the topsoil stockpile.

Latitude: 47.39930028

Longitude: -103.83667047

PU-21-048: Observation Point Photolog



Observation Point: 8
Date Taken: September 15, 2022
Direction Photo is Taken:
Spread: Loenbro

Photo Description: Amount of subsoil mixing minimized on stockpiles.

Latitude: 47.40025346
Longitude: -103.83532219



Observation Point: 9 (Photo 1)
Date Taken: September 15, 2022
Direction Photo is Taken:
Spread: Loenbro

Photo Description: Subsoil/C material on shallow topsoil stockpile. Stripping was too deep in first lift. Granted, the coarse frags are shallow. 40 ft area of mixing. Assumed not purposely done and a minor issue.

Latitude: 47.44725829
Longitude: -103.76897054



Observation Point: 9 (Photo 2)
Date Taken: September 15, 2022
Direction Photo is Taken:
Spread: Loenbro

Photo Description: Subsoil/C material on shallow topsoil stockpile. Stripping was too deep in first lift. 40 ft area of mixing.

Latitude: 47.44725829
Longitude: -103.76897054

PU-21-048: Observation Point Photolog



Observation Point: 10
Date Taken: September 15, 2022
Direction Photo is Taken: Northwest
Spread: Loenbro

Photo Description: Alignment agrees with route shapefile. The ROW is not trenched yet.

Latitude: 47.4543462
Longitude: -103.75952307



Observation Point: 11
Date Taken: September 15, 2022
Direction Photo is Taken: Northeast
Spread: Loenbro

Photo Description: No topsoil salvaged, as little to none is present on this hilltop. Right of way view in badland/rocky area. Wetlands are in the background, with areas of the ROW under water.

Latitude: 47.45967914
Longitude: -103.75324057



Observation Point: 12
Date Taken: September 15, 2022
Direction Photo is Taken: Northeast
Spread: Loenbro

Photo Description: Suitable ROW segregation.

Latitude: 47.49096599
Longitude: -103.70052

PU-21-048: Observation Point Photolog



Observation Point: 13

Date Taken: September 15, 2022

Direction Photo is Taken: East

Spread: Loenbro

Photo Description: Pipe is confirmed to be 48 inches below grade. The trench is 68 inches deep.

Latitude: 47.49097048

Longitude: -103.70037435



Observation Point: 14

Date Taken: September 15, 2022

Direction Photo is Taken: South

Spread: Loenbro

Photo Description: Stockpile overlap on appropriately stripped ROW is minor.

Latitude: 47.51669249

Longitude: -103.6327365

PU-21-048: Observation Point Photolog



Observation Point: 15

Date Taken: September 15, 2022

Direction Photo is Taken: West

Spread: Loenbro

Photo Description: Adequate topsoil depth stripped

Latitude: 47.5379741

Longitude: -103.60445699



Observation Point: 16

Date Taken: September 15, 2022

Direction Photo is Taken: Southwest

Spread: Loenbro

Photo Description: The stockpiling and segregation is appropriate. Areas with overlapping stockpiles will most likely mix upon replacement.

Latitude: 47.57688249

Longitude: -103.56709995



Observation Point: 17

Date Taken: September 15, 2022

Direction Photo is Taken: North

Spread: Loenbro

Photo Description: Pipeline confirmed to be buried below 48 inches assuming topsoil replacement is >5 inches.

Latitude: 47.57667016

Longitude: -103.56717395

PU-21-048: Observation Point Photolog



Observation Point: 18

Date Taken: September 15, 2022

Direction Photo is Taken: West

Spread: Loenbro

Photo Description: Boring under Road confirmed below 72 inches.

Latitude: 47.59796502

Longitude: -103.54730054



Observation Point: 19

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Pipe depth below 72 inches. 16-inch pipe was approximately 88 inches deep, and there is space between the pipeline and trench bottom.

Latitude: 47.64574151

Longitude: -103.44073843

PU-21-048: Observation Point Photolog



Observation Point: 20

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Pipe is greater than 48 inches below grade.

Latitude: 47.64570901

Longitude: -103.44086169



Observation Point: 21

Date Taken: September 15, 2022

Direction Photo is Taken: North

Spread: Loenbro

Photo Description: Additional excavation around existing pipelines, and brine lines.

Latitude: 47.67652906

Longitude: -103.42091593



Observation Point: 22

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Loenbro

Photo Description: Pipeline is confirmed to be below 48 inches deep.

Latitude: 47.6774499

Longitude: -103.39841401

PU-21-048: Observation Point Photolog



Observation Point: 23
Date Taken: September 15, 2022
Direction Photo is Taken: Southwest
Spread: Tomahawk

Photo Description: Minor mixing of subsoil stockpile on top of topsoil. Nearby geologically unstable area outside of active ROW.

Latitude: 47.72953305
Longitude: -103.24750283



Observation Point: 24 (Photo 1)
Date Taken: September 15, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Construction near geologically unstable area. Uncertain where topsoil stockpile is in this portion of ROW.

Latitude: 47.73000679
Longitude: -103.24496458



Observation Point: 24 (Photo 2)
Date Taken: September 15, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Construction through geologically unstable area. Adequate buffer is Bridger's planned physical mitigation strategy. Silt Fence installed in swale.

Latitude: 47.73000679
Longitude: -103.24496458

PU-21-048: Observation Point Photolog



Observation Point: 24 (Photo 3)

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Construction near geologically unstable area. Work along ROW may have resulted in some fill in a swale.

Latitude: 47.73000679

Longitude: -103.24496458



Observation Point: 25

Date Taken: September 15, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: BMPs protecting topsoil stockpile on steep slope.

Latitude: 47.73042239

Longitude: -103.23903193

PU-21-048: Observation Point Photolog



Observation Point: 26

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: In-situ Topsoil still remaining in ROW workspace. Recommend additional topsoil salvage during trenching and decompaction during replacement.

Latitude: 47.74612848

Longitude: -103.15116661



Observation Point: 27 (Photo 1)

Date Taken: September 14, 2022

Direction Photo is Taken: Northeast

Spread: Tomahawk

Photo Description: Topsoil remains unstripped in approach area. Recommend additional topsoil salvage prior to trenching and decompaction during replacement.

Latitude: 47.7461255

Longitude: -103.15106609



Observation Point: 27 (Photo 2)

Date Taken: September 14, 2022

Direction Photo is Taken: Northeast

Spread: Tomahawk

Photo Description: Confirmed HDD use under stream.

Latitude: 47.7461255

Longitude: -103.15106609

PU-21-048: Observation Point Photolog



Observation Point: 28 (Photo 1)

Date Taken: September 14, 2022

Direction Photo is Taken: South

Spread: Tomahawk

Photo Description: HDD location under stream. Pipe depths could not be verified but does not appear to be ≥ 48 inches. The depth may be ≥ 48 inches after backfilling.

Latitude: 47.74910968

Longitude: -103.14304736



Observation Point: 28 (Photo 2)

Date Taken: September 14, 2022

Direction Photo is Taken: South

Spread: Tomahawk

Photo Description: HDD location under stream. Pipe depths could not be verified but does not appear to be ≥ 48 inches. The depth may be ≥ 48 inches after backfilling.

Latitude: 47.74910968

Longitude: -103.14304736

PU-21-048: Observation Point Photolog



Observation Point: 29

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Topsoil was stripped revealing subsoil with roots.

Latitude: 47.75076977

Longitude: -103.13933701



Observation Point: 30

Date Taken: September 14, 2022

Direction Photo is Taken: Northeast

Spread: Tomahawk

Photo Description: BMP's used along Cherry Creek. HDD method also confirmed.

Latitude: 47.75244032

Longitude: -103.13502072

PU-21-048: Observation Point Photolog



Observation Point: 31

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: HDD pad confirmation north of Cherry Creek.

Latitude: 47.75422612

Longitude: -103.13354563



Observation Point: 32

Date Taken: September 14, 2022

Direction Photo is Taken: North

Spread: Tomahawk

Photo Description: Area is a large and steep side slope cut.

Latitude: 47.75477756

Longitude: -103.13320236

PU-21-048: Observation Point Photolog



Observation Point: 33

Date Taken: September 14, 2022

Direction Photo is Taken: North

Spread: Tomahawk

Photo Description: Topsoil stockpile upslope of large subsoil stockpile. ROW crossing a steep side slope.

Latitude: 47.7552748

Longitude: -103.1332112



Observation Point: 34

Date Taken: September 14, 2022

Direction Photo is Taken: West

Spread: Tomahawk

Photo Description: Appropriate stockpile separation.

Latitude: 47.76334029

Longitude: -103.12456113



Observation Point: 35

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Pipe has not been placed into trench, trench depth was confirmed to be 73-inches deep.

Latitude: 47.7642401

Longitude: -103.1137138

PU-21-048: Observation Point Photolog



Observation Point: 36
Date Taken: September 14, 2022
Direction Photo is Taken: East
Spread: Tomahawk

Photo Description: Topsoil and subsoil separated with minor stockpile mixing.

Latitude: 47.76525197
Longitude: -103.11054535



Observation Point: 37
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Stantec is unable to confirm if topsoil is piled upslope of subsoil on the right-hand side. Preventing topsoil to mix during replacement may be difficult.

Latitude: 47.76393364
Longitude: -103.10634138



Observation Point: 38
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Trench aligns with shape file and contains appropriate soil segregation.

Latitude: 47.76359844
Longitude: -103.10238734

PU-21-048: Observation Point Photolog



Observation Point: 39
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Topsoil segregated correctly and not mixing with subsoil.

Latitude: 47.76720551
Longitude: -103.0784666



Observation Point: 40
Date Taken: September 14, 2022
Direction Photo is Taken: West
Spread: Tomahawk

Photo Description: Pipeline depth \geq 48 inches below grade. Backfilling in progress with appropriate grading.

Latitude: 47.76717202
Longitude: -103.07843406

PU-21-048: Observation Point Photolog



Observation Point: 41

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: The trench is ~48 inches deep. Stantec assumes depth will be ≥ 48 inches after backfilling.

Latitude: 47.76320883

Longitude: -103.02662859



Observation Point: 42

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Adequate pipe depth.

Latitude: 47.76378373

Longitude: -103.02197257

PU-21-048: Observation Point Photolog



Observation Point: 43
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Use of timber mat through wetland.

Latitude: 47.76381922
Longitude: -103.02156057



Observation Point: 44
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Adequate subsoil replacement. Topsoil stockpile adjacent to right of way is unmixed.

Latitude: 47.76448086
Longitude: -103.01474984



Observation Point: 45
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Topsoil was stripped revealing subsoil with roots.

Latitude: 47.76471714
Longitude: -103.01218012

PU-21-048: Observation Point Photolog



Observation Point: 46
Date Taken: September 14, 2022
Direction Photo is Taken: Southwest
Spread: Tomahawk

Photo Description: Adequate pipe depth.

Latitude: 47.76469326
Longitude: -103.01200512



Observation Point: 47
Date Taken: September 14, 2022
Direction Photo is Taken:
Spread: Tomahawk

Photo Description: Pipeline confirmed to be ≥ 48 inches deep.

Latitude: 47.76364091
Longitude: -102.99987942

PU-21-048: Observation Point Photolog



Observation Point: 48

Date Taken: September 14, 2022

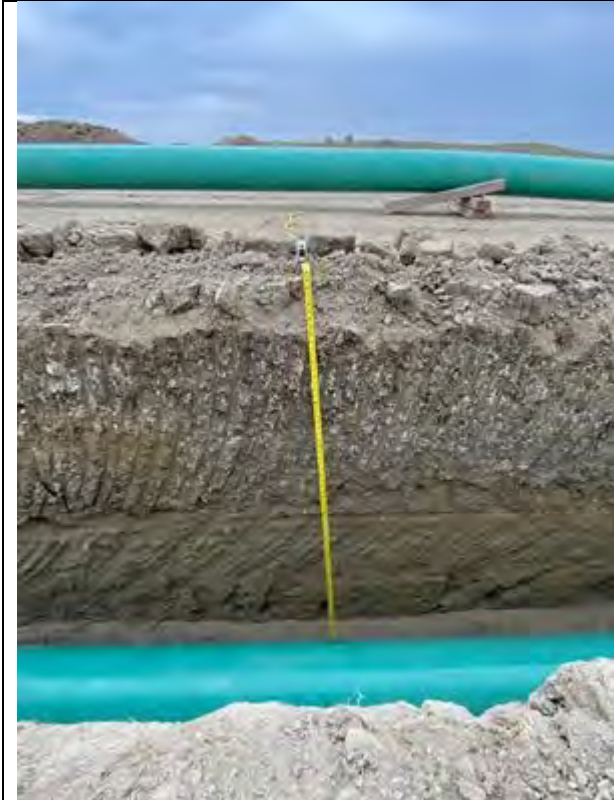
Direction Photo is Taken: West

Spread: Tomahawk

Photo Description: Pipe verified to be 62 inches below open trench surface.

Latitude: 47.76351782

Longitude: -102.99051312



Observation Point: 49

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Confirmed 59-inch pipe depth.

Latitude: 47.76382502

Longitude: -102.99022275

PU-21-048: Observation Point Photolog



Observation Point: 50
Date Taken: September 14, 2022
Direction Photo is Taken: Southwest
Spread: Tomahawk

Photo Description: Good soil segregation with no topsoil/subsoil mixing observed.

Latitude: 47.76410045
Longitude: -102.99042655

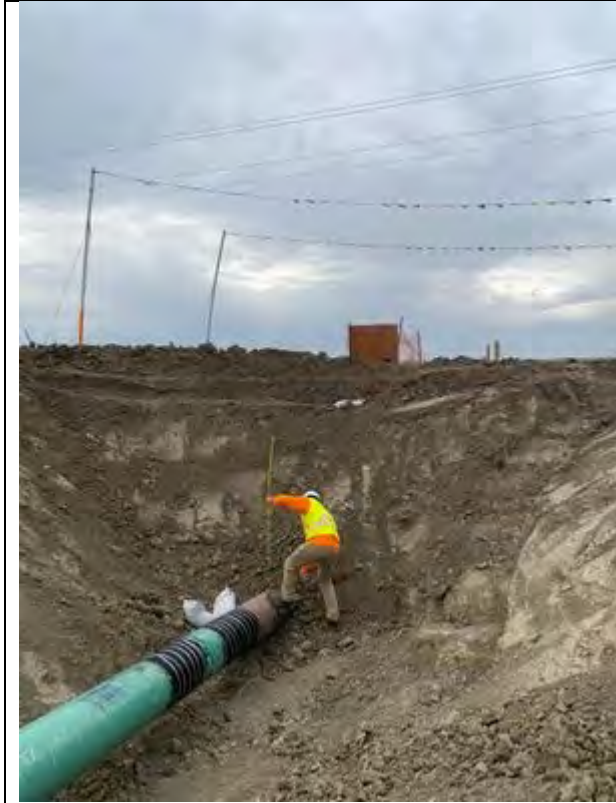


Observation Point: 51
Date Taken: September 14, 2022
Direction Photo is Taken: Southeast
Spread: Tomahawk

Photo Description: Topsoil appropriately stripped.

Latitude: 47.76410645
Longitude: -102.99010566

PU-21-048: Observation Point Photolog



Observation Point: 52

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: 72 inch pipe depth bored under road.

Latitude: 47.78286615

Longitude: -102.9414349



Observation Point: 53

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Confirmed ≥ 48 -inch depth. Trench was benched at photo location.

Latitude: 47.78295446

Longitude: -102.94076204

PU-21-048: Observation Point Photolog



Observation Point: 54

Date Taken: September 14, 2022

Direction Photo is Taken: East

Spread: Tomahawk

Photo Description: Not all topsoil was stripped. Bridger representative stated 12-in was stripped where possible.

Latitude: 47.78300618

Longitude: -102.94061552



Observation Point: 55

Date Taken: September 14, 2022

Direction Photo is Taken:

Spread: Tomahawk

Photo Description: Pipe depth verified to be \geq 48 in.

Latitude: 47.78672847

Longitude: -102.9014413

PU-21-048: Observation Point Photolog



Observation Point: 56

Date Taken: September 14, 2022

Direction Photo is Taken: Northeast

Spread: Tomahawk

Photo Description: Spread 3 reclaimed area.

Latitude: 47.79777081

Longitude: -102.89816535