MONTANA-DAKOTA UTILITIES CO.

Before the North Dakota Public Service Commission

Case No. PU-22-___

Direct Testimony

Of

Robert Frank

Q. Please state your name and business address.

A. My name is Robert Frank, and my business address is 400 North Fourth Street, Bismarck, North Dakota.

Q. By whom are you employed and in what capacity?

A. I am employed by Montana-Dakota Utilities Co. (Montana-Dakota) as the Director of Electric Transmission Engineering.

Q. Please describe your duties and responsibilities with Montana-Dakota.

A. I have leadership responsibility for the engineering, design, construction, and maintenance of Montana-Dakota's electric transmission and substation facilities, including property and right-of-way acquisitions of the Company.

Q. Please outline your educational and professional background.

A. I received my Bachelor of Science degree in Electrical Engineering from North Dakota State University in 2002. I received my Master of Business Administration the University of Mary in 2008. In 2015, I

attended the Utility Executive Course at the University of Idaho. I am a registered Professional Engineer in the State of North Dakota.

I began my career at Montana-Dakota in 2004 as a system protection engineer in the Electric Transmission Engineering Department. Throughout the next ten years, I worked on various substation and transmission projects gaining experience in engineering design, project management, construction management, and real estate transactions. In 2014, I accepted my current position.

Prior to joining Montana-Dakota, I worked for an industrial contractor as a field engineer providing engineering support to construction crews and project management duties.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide an overview of Montana-Dakota's large transmission and substation capital projects that are planned for 2022 and 2023 and included in this case.

MAJOR CAPITAL PROJECTS

Q. Would you please describe the major capital projects that have been recently completed and the projects that are currently underway?

A. Yes. I will provide a description of each project including the need for each project.

Beulah Transmission Substation Rebuild

Q1. Please describe the Beulah Substation Rebuild project.

A. This project involved building a new Beulah 115/41.6 kV

Transmission Substation (Beulah 7th Street Transmission Substation) adjacent to the existing Beulah Transmission Substation. The substation is being rebuilt due to the age and condition of the existing facilities. The existing transmission lines will be re-routed to the new substation.

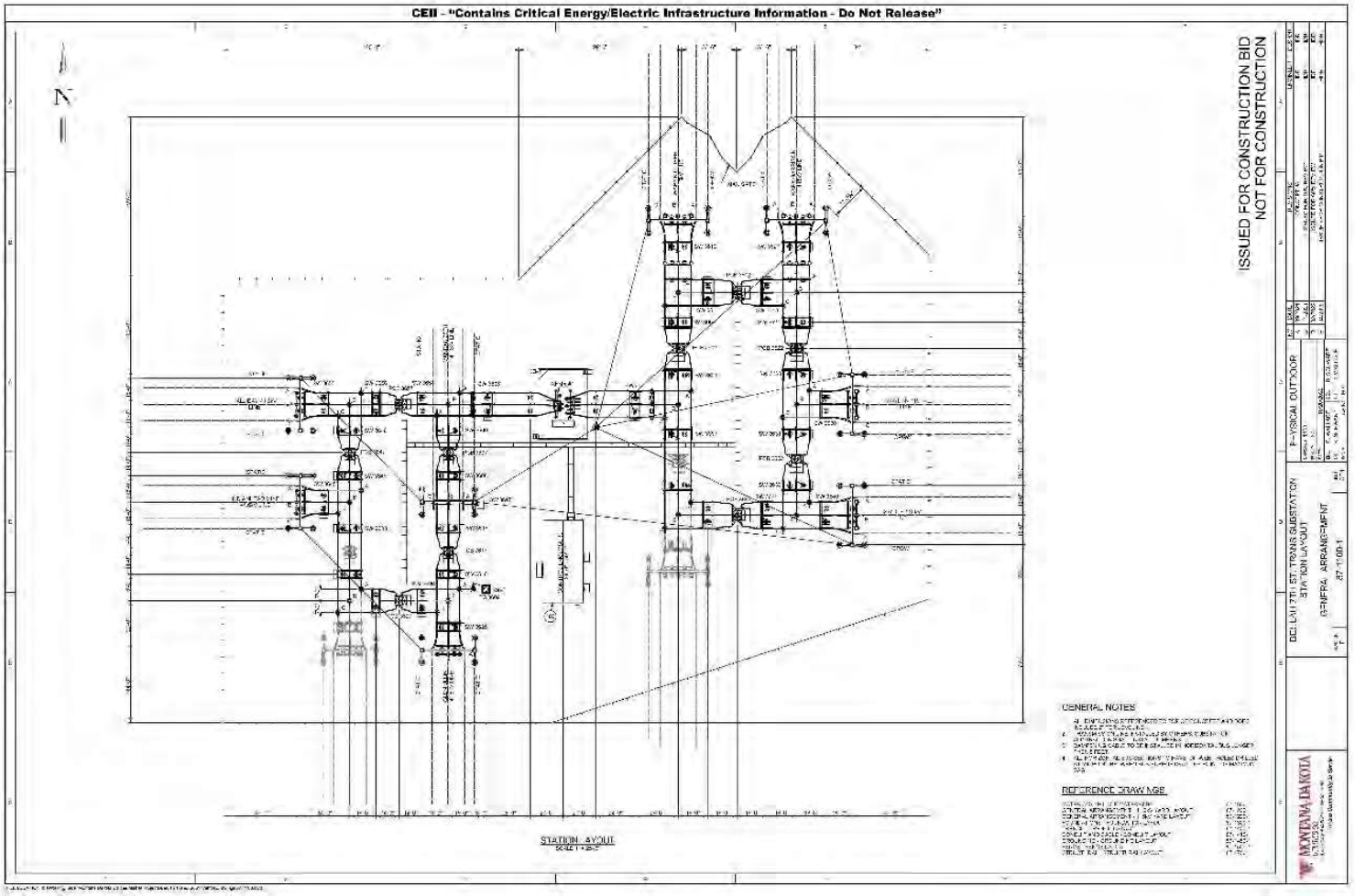

Figure 1 – Beulah 7th St Substation Layout

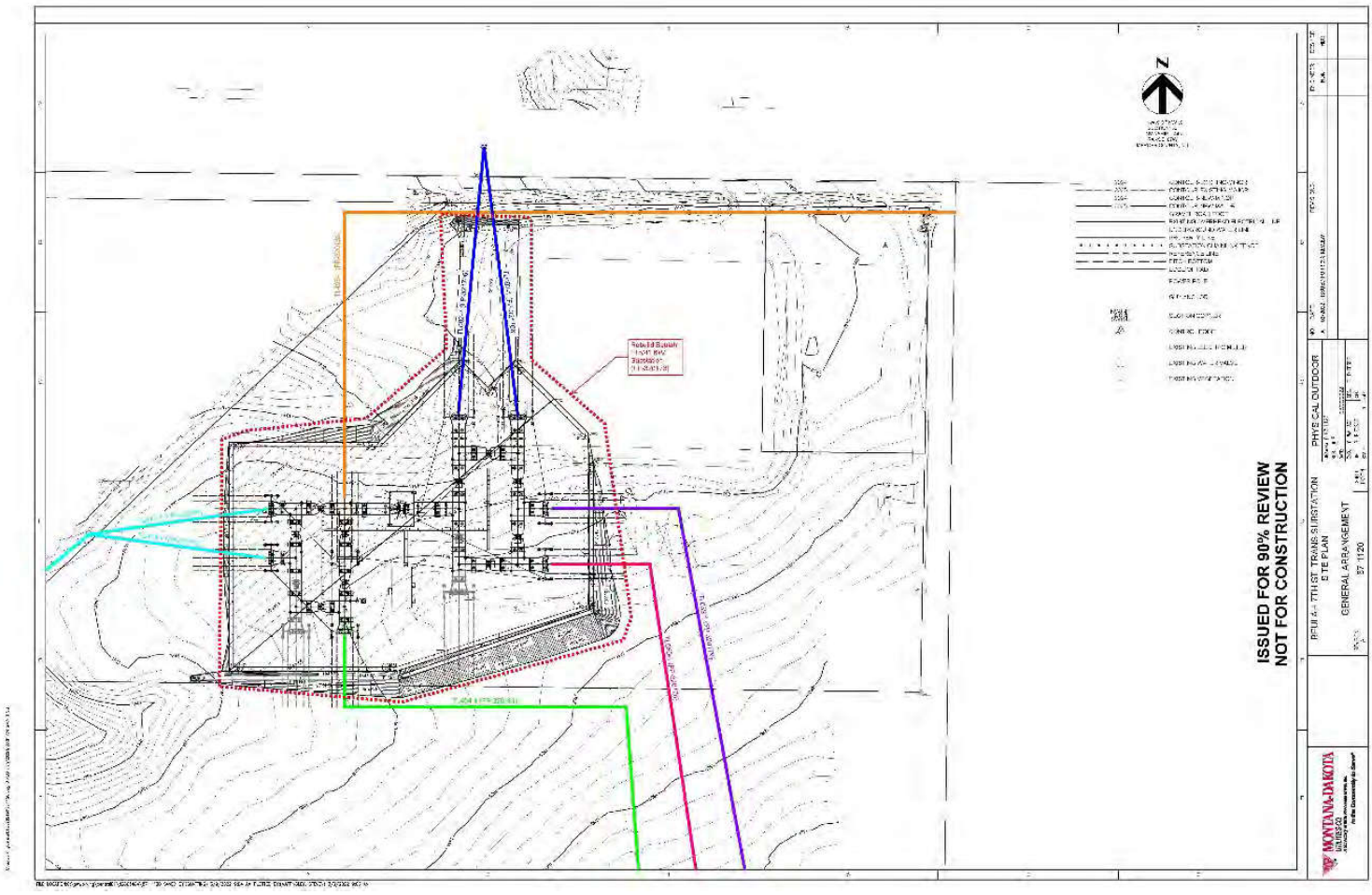

Figure 2 – Beulah 7th St Substation Transmission Line Reroutes

Q2. Why did Montana-Dakota undertake this project?

A. Montana-Dakota's System Protection Engineers identified the need to replace the protection and control systems within the substation. A full review was then performed of the components of the protection system and the other equipment in the substation. Most of the protection and control components are obsolete, the cables and other material have deteriorated and are failing, the yard equipment requires considerable

maintenance and repair. The substation was built in 1962. As a result of this review, the decision was made to rebuild the entire substation.

Q3. What is the project timeline?

A. Project design was started in 2021 with construction starting the summer of 2022 and project completion in 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota customers will see a substantial improvement in reliability. The existing system protection systems are inadequate for the current system configuration, resulting in additional and extended outages to customer load served out of this substation. New substation equipment provides improved materials, technology, and designs.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative to a complete substation rebuild is to replace only those components that are not repairable. This alternative will delay some cost but will require continued construction at this facility resulting in higher costs replacing piece by piece and higher operation and maintenance costs.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Beulah 7th Street Transmission Substation - $4,883,162 as shown in FP-320173 found in Statement B, Schedule B-2, page 3.

Transmission line reroutes - $1,530,642 as shown on Statement B, Schedule B-2, pages 3 and 8 (as Various Project Numbers associated with the Reroute Line to New Beulah Substation and FP-300152) and on Statement B, Schedule B-1, page 8 as $700,503 of the Various Project Numbers associated with the Reroute Line.

Transmission Line Rebuild – Halliday to Dodge 41.6 kV Line

Q1. Please describe the Halliday to Dodge ND Line Rebuild project.

A. This project involves rebuilding the existing 41.6 kV transmission line that connects Halliday, ND to Dodge, ND. This is part of Montana-Dakota's transmission system that serves customers from Killdeer, ND to Beulah, ND.

Figure 3 – Halliday to Dodge Line Route

Q2. Why did Montana-Dakota undertake this project?

A. This transmission line section has a recent history of a significant

number of outages. Routine patrols and inspections have indicated increased deterioration and wear. This line was constructed in 1947.

Q3. What is the project timeline?

A. Project design was started early 2022 with construction starting the summer of 2023 and project completion in late 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota customers will see improvement in reliability. The Company has modified its design standards for transmission line construction. Lines of this voltage class are now built using horizontal post insulators with a pole top shield wire instead of crossarms and no shield wire as was originally built.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative to a complete line rebuild is to replace components through routine inspections or repair following outages. This alternative will result in higher overall replacement costs and higher operation and maintenance costs.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Transmission line rebuild - $3,763,745 as shown as FP-318491 on Statement B, Schedule B-1, page 8.

Transmission Line Rebuild – Crosby to Alamo 41.6 kV Line

Q1. Please describe the Crosby to Alamo ND Line Rebuild project.

A. This project involves rebuilding the existing 41.6 kV transmission line that connects Crosby, ND to Alamo, ND. This is part of Montana-Dakota's transmission system that serves customers from Zahl, ND to Lignite, ND.

Figure 4 – Crosby to Alamo Line Route (Phase 1)

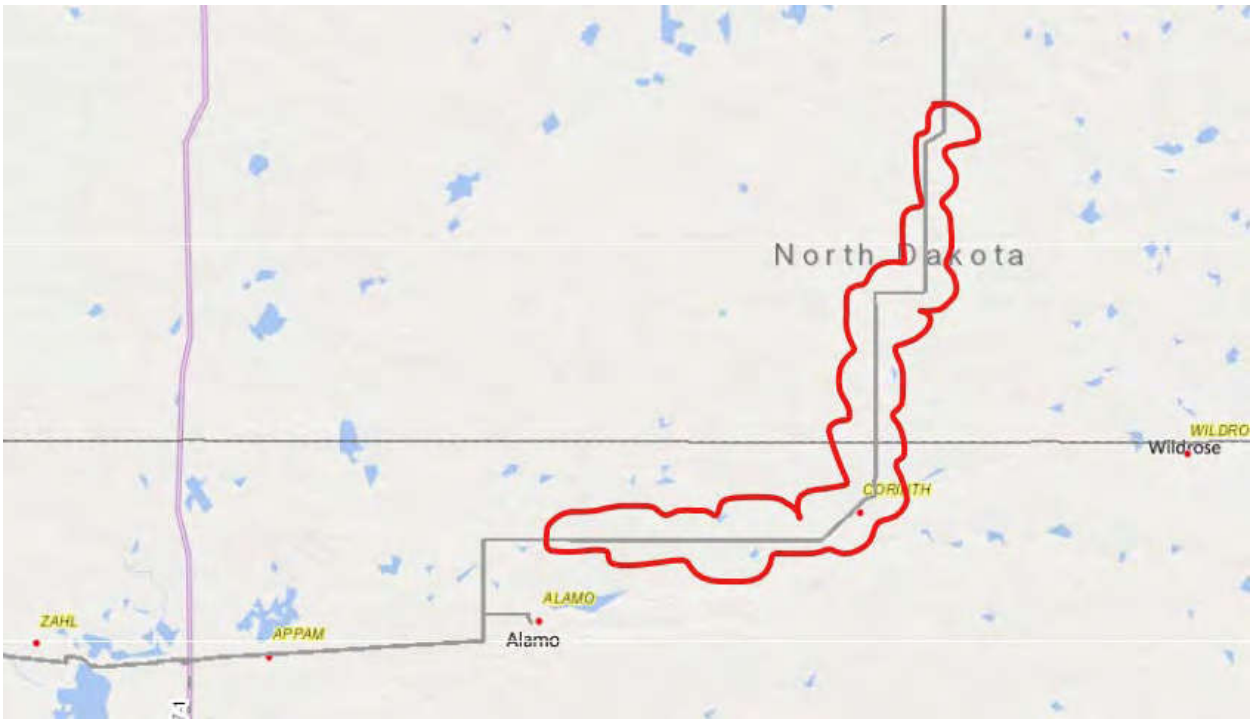

Figure 5 – Crosby to Alamo Line Route (Phase 2)

Q2. Why did Montana-Dakota undertake this project?

A. This transmission line section has a recent history of a significant number of outages. Routine patrols and inspections have indicated increased deterioration and wear. This line was constructed in 1948.

Q3. What is the project timeline?

A. Project design was started early 2022 with construction of Phase 1 starting the winter of 2022, construction of Phase 2 starting the summer of 2023, and project completion late 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota customers will see improvement in reliability. The Company has modified its design standards for transmission line construction. Lines of this voltage class are now built using horizontal post

insulators with a pole top shield wire instead of crossarms and no shield wire as was originally built.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative to a complete line rebuild is to replace components through routine inspections or repair following outages. This alternative will result in higher overall replacement costs and higher operation and maintenance costs.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Phase 1 transmission line rebuild - $2,110,983 as shown as FP-302569 in Statement B, Schedule B-1, page 3.

Phase 2 transmission line rebuild - $1,548,187 as shown as FP-307501 in Statement B, Schedule B-1, page 8.

Watford City Line Projects

Q1. Please describe the Watford City line projects.

A. The Watford South Transmission Substation was designed to provide a termination point for the 34.5 kV transmission line that serves Alexander, ND. When pursuing line routes to make connections, right of way acquisition challenges were encountered and therefore the option to double circuit an existing 34.5 kV transmission line was pursued. A review of the current condition of that existing 34.5 kV transmission line confirmed the need to rebuild that circuit. The Watford City line projects involve

building a double circuit 34.5 kV transmission line from the Watford South Substation to the Alexander line tap and also rebuilding an existing portion of the Watford 34.5 kV Loop Line.

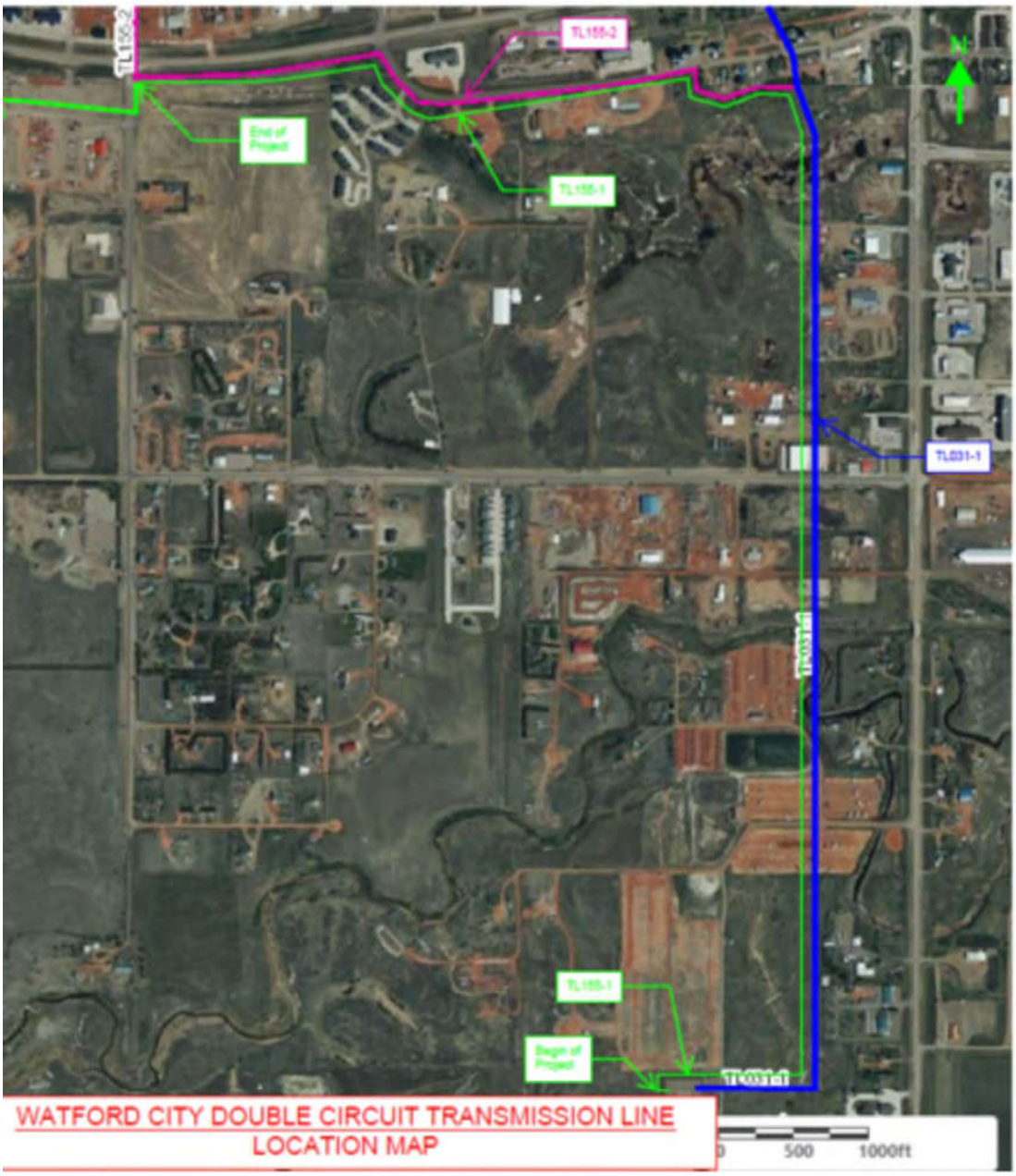

Figure 6 – Watford City Line Projects

Q2. Why did Montana-Dakota undertake this project?

A. The ability to separate Alexander from the Watford Loop Line reduces line mile exposure and increasing reliability to most of Montana-Dakota customers in the Watford City area. This original line being rebuilt was constructed in 1969.

Q3. What is the project timeline?

A. Project design was started in 2021 with construction starting the winter of 2022 and project completion the summer of 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. This circuit separation allows operation flexibility with more precise monitoring and control. The new double circuit transmission line will be constructed with new transmission line designs and construction standards.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative considered was to build a new transmission line on new right of way for the Alexander circuit. After considering several route options and interviewing landowners along those routes, the Company expected significant delays and cost increases to acquire new right of way in that area of Watford City.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Build new Alexander 34.5 kV transmission line - $1,312,225 as shown as FP-318214 in Statement B, Schedule B-1, pages 3 and 8.

Rebuild existing Watford 34.5 kV Loop line - $841,867 as shown as FP-316204 in Statement B, Schedule B-1, page 3.

Mobile Distribution Substation

Q1. Please describe the Mobile Distribution Substation project.

A. This project involves purchasing a new mobile distribution substation to provide a replacement option for construction and maintenance activities in existing distribution substations on Montana-Dakota's system. The substation can also be used for emergency use due to failed equipment. The substation is designed to be used for various voltage sources and loads with configuration settings in the substation. This allows use across most of Montana-Dakota's system.

Figure 7 – Mobile Distribution Substation Example

Q2. Why did Montana-Dakota undertake this project?

A. Montana-Dakota currently owns a mobile distribution substation that was purchased in 1966. The existing substation has a smaller transformer that is undersized for a large portion of the distribution substations on the system. The other equipment is aging and in need of replacement and the protection schemes are obsolete and do not

coordinate and communicate with other distribution systems. Furthermore, the Company owns two mobile transmission substations, one of which was purchased in 2021.

Q3. What is the project timeline?

A. The mobile substation will be designed and ordered in 2022 and delivered in 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota has developed the practice of having spare and mobile equipment available for equipment failures and emergency situations. Not having a mobile substation available can lead to more outages and/or longer outages to customer load.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative considered is rebuilding the existing mobile substation. This would require shipping the mobile substation to a manufacturer for 12-18 months for replacement of equipment and rebuilding of the transformer and trailer. This substation would then be unavailable for emergency or construction activities. The costs are also unknown until the substation is inspected and dismantled at the manufacturer upon arrival. Therefore, the decision was made to purchase a new mobile substation prior to determining what can be done with the existing substation.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Purchase Mobile Distribution Substation - $2,397,849 as shown as FP-307655 on Statement B, Schedule B-1, page 8.

Linton, ND Distribution Substation Projects

Q1. Please describe the Linton, ND Distribution Substation projects.

A. These projects involve constructing new distribution substations in Linton, ND. A new 41.6/4.16 kV substation will be constructed on purchased property near the existing distribution substation. A new 41.6/12.47 kV substation will be constructed at the old Linton Transmission Substation location. The Linton Transmission Substation will be retired as part of this project. Transmission lines within Linton will also be rerouted as part of this project.

Figure 8 – Mobile Distribution Substation Layout

Q2. Why did Montana-Dakota undertake this project?

A. The distribution substation has aged significantly. Most of the equipment in the substation was installed in 1965 as well as associated materials and components.

Q3. What is the project timeline?

A. Project design was started in 2021 with construction of the 41.6/4.16 kV substation occurring the summer of 2022. Retirement of the Linton Transmission Substation will start the summer of 2022 with construction of the 41.6/12.47 kV substation occurring during the summer of 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota customers will see an improvement in reliability with the installation of new distribution substations within the Linton area. New equipment and modern protection and control devices.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The alternative to a complete substation rebuild is to replace only those components that are not repairable. This alternative will delay some cost but will require continued construction at this facility resulting in higher costs replacing piece by piece and higher operation and maintenance costs.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Construct Linton 41.6/4.16 kV Distribution Substation - $583,127 as shown as FP-321708 in Statement B, Schedule B-1, page 3.

Linton Transmission Substation Demolition – $375,000 as shown as FP-321739 in Statement B, Schedule B-1, page 3.

Construct Linton 41.6/12.47 kV Distribution Substation - $233,093 and Linton Transmission Line reroutes – $149,248 as shown as Various Project Numbers associated with Construct New Substation – Linton in Statement B, Schedule B-1, page 4.

Distribution Substation Projects

Q1. Please describe the Distribution Substation projects.

A. Montana-Dakota will undergo four large distribution substations. These projects include:

1) A new 60/12.47 kV substation on the west side of Williston, named the Williston Sand Creek Distribution Substation;
2) Rebuild the Watford City North Distribution Substation;
3) Install a second power transformer and associated equipment at the Mandan Collins Distribution Substation; and
4) Install a second power transformer and associated equipment at the Mandan Midway Distribution Substation.

Q2. Why did Montana-Dakota undertake these projects?

A. The substation construction projects are driven by load growth and reliability improvements in these locations. The new Willison Sand Creek Substation is driven by load growth in certain areas of Williston, ND.

Rebuilding the Watford City North Substation replaces aged equipment and provides a substation design for future load growth served from that substation. Installing multiple power transformers in existing substations provides redundancy to improve reliability and system operating flexibility.

Q3. What is the project timeline?

These projects will start the summer of 2022 and will be completed the fall of 2023.

Q4. How will the Montana-Dakota customers benefit from the project?

A. Montana-Dakota customers will see an improvement in reliability with the installation of new and rebuilt distribution substations or additions within existing substations. New equipment and modern protection and control devices.

Q5. Describe any alternatives considered to address the identified issues, if any, and associated costs compared to the chosen project.

A. The projects are closely related to load growth within certain areas in Montana-Dakota's service territory. No alternatives exist to building or adding equipment when experiencing load growth.

Q6. What are the costs of the project?

A. The costs of the project are as follows:

Build new Williston West Distribution Substation - $1,364,360 as shown as FP-100473 in Statement B, Schedule B-1, page 8.

Rebuild Watford City North Distribution Substation - $354,933 as shown as FP-317252 in Statement B, Schedule B-1, page 3.

Install second power transformer at Mandan Collins Distribution Substation - $1,296,254 as shown as FP-316186 in Statement B, Schedule B-1, page 3.

Install second power transformer at Mandan Midway Distribution Substation - $954,683 as shown as FP-315478 in Statement B, Schedule B-1, page 8.

Q. Does this complete your direct testimony?

A. Yes, it does.