North Dakota Transmission Authority

North Dakota Industrial Commission

BIL 40101(d) Application

Project Title:

Overhead to Underground

Applicant:

City of Lakota/Lakota Municipal Utilities

Date of Application:

11/20/2023

Amount of Grant Request:

$1,620,154.25

Total Amount of Proposed Project:

$2,492.545.00

Duration of Project:

May 2024 – October 2025 (18 months)

Point of Contact (POC):

Amie Vasichek

POC Telephone:

701-247-2454

POC Email:

lakotact@polarcomm.com

POC Address:

PO Box 505

Lakota, ND 58344

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Applicant Description

The City of Lakota is in Nelson County, ND and is also the county seat. The City of Lakota has a population of 680 residents and continues to grow. The City of Lakota owns and operates our own utility; Lakota Municipal Utilities which provides electricity, water, and sewer to our customers. The Lakota Municipal Utilities sold 15,141,805 kWh in 2022 to our customers.

Project Description

The city of Lakota and Lakota Municipal Utilities would like to convert the overhead electrical lines to underground throughout town. We feel this is a needed project within our community as we have an aging system and currently do not have journeyman linemen on staff to complete necessary maintenance or handle outages.

The city of Lakota & Lakota Municipal Utilities will follow NDCC and bid out the entire project with the requirement of the contractor to follow the RTES, NEPA AND DBA guidelines.

Lakota Municipal Utilities has a bucket truck and other equipment that will be used to assist with the project and help elevate costs.

Standards of Success

In 2020 Missouri River Energy Services (MRES) conducted an assessment of Lakota's Distribution System. In the provided assessment, it was noted one of the high priority items was to replace or upgrade the aging wooden electrical poles. North Dakota is known for high winds; with the condition our electrical poles are in it is very likely to have frequent outages. This raises another concern for a risk of harming a person or destruction of property with the aging poles. Although we understand this measure is more expensive up front, we feel it is more cost-effective in the long run as we would need to hire subcontractors to repair lines in an outage due to the lack of having a journeyman lineman on staff. Putting the overhead lines underground will require less maintenance and are less likely to need repairs or replacement over time. With the increased protection from severe weather, it will be less likely to have an electrical fire.

This provides a more reliable service to our citizens and businesses. This project also has a positive economic impact by reducing outage-caused downtime for our Lakota business community.

As stated in the MRES assessment, our overall distribution pole condition needs replacement. Our primary sub-contractor, North Holt Electric, is approximately 75 miles away and during times of need are not always able to make Lakota Municipal Utility a priority as they also service other customers. This consideration would potentially have Lakota without power for an extended timeframe.

Over the course of 10 years, Lakota Municipal has hired over $440,000 in sub-contractors/Journeymen Lineman for repair work needed to the distribution system. This cost does not include other expenses such as engineering, equipment, and in-kind labor that we have also incurred.

Project Timeline

If awarded, we anticipate this project to begin summer 2024, however we are also aware the extended time it will take for the appropriate transformers to be built and delivered. This may cause a delay in the project, but we will work with our contractor to proceed with as much prep work as possible leading up to delivery of the transformers. We estimate the 12-15 months for the delivery of the transformers.

Project Budget

Contractor Labor and Equipment - $1,793,950

Mobilization - $72,000

Engineering Services - $ 100,000

Transformers - $300,000

Contingencies (10%) - $226,595

Total estimated project cost - $2,492,545

The city of Lakota is fully prepared to provide 35% cost match of the project amounting to $872,390.75. We anticipate financing a portion of the cost match in addition to utilizing some of our reserves.

Summary of MRES Assessment for Lakota Distribution System

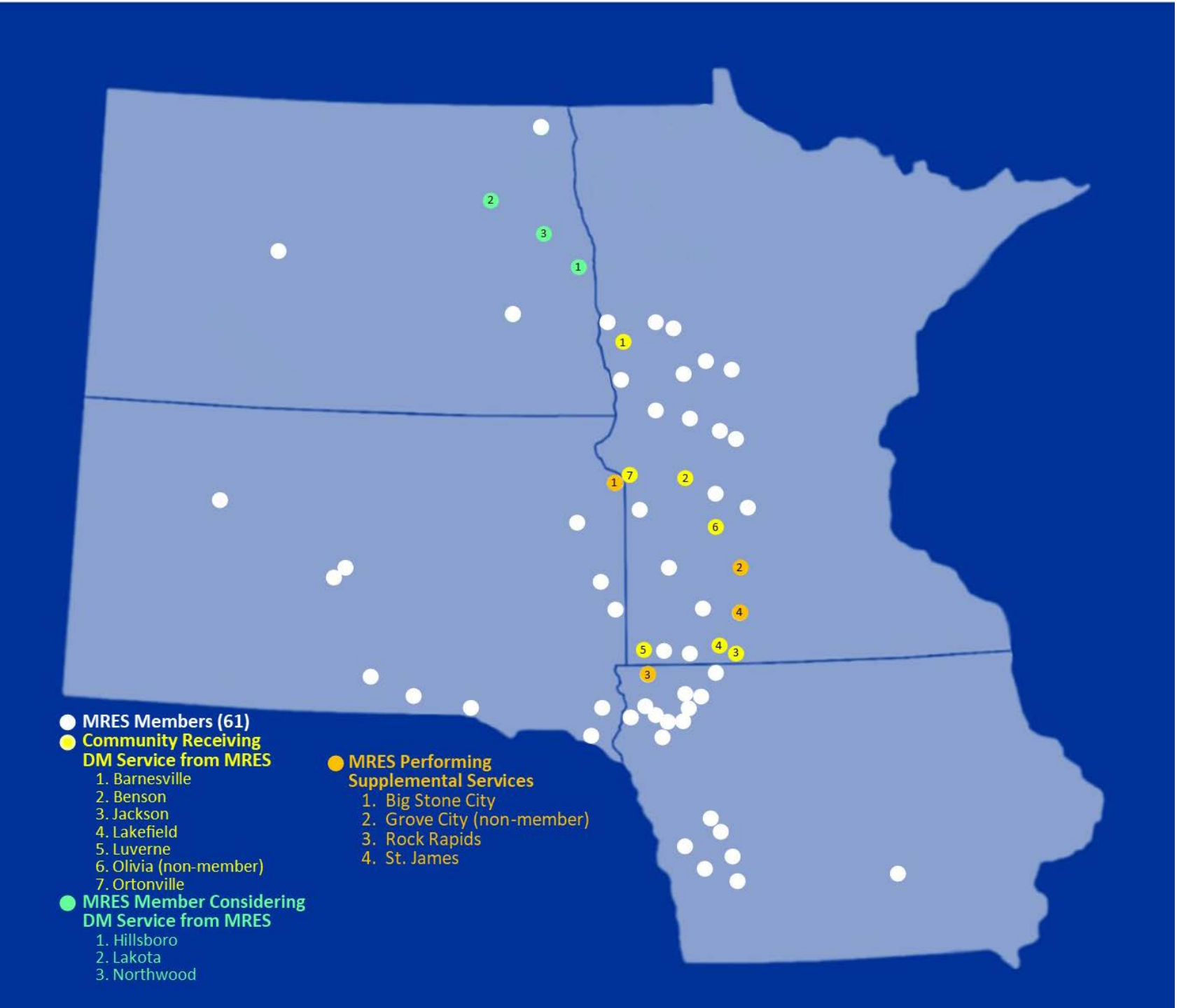
Completed July 2020

Agenda

- Summary of MRES Distribution Maintenance (DM) Capabilities
- Review results of on site assessment
- Review recommendations
- Summary
- Next Steps

Summary of MRES DM Capabilities

- Program is intended to help municipalities retain control over their municipal electric utility by providing qualified electrical lineworkers
  - Example is that we want municipals to provide the equipment and to allow them to have ability to provide services w/o MRES assistance.
- Performs full DM services for 7 communities
  - Barnesville, Ortonville, Benson, Luverne, Olivia, and Jackson/Lakefield (shared crew leader/crew)
- Perform supplemental services for another 7 communities
  - Management services
    - Regular basis - Rock Rapids, St. James
    - Assessment - Hillsboro, Northwood, Lakota
  - Other members provide assistance on regular basis – Big Stone, Grove City
- Do perform some traditional contractor like services, but at this point, we are not well suited for that work.



MRES Member and DM Communities Map

Review results of on site assessment

WAPA/Lakota Main Sub

- The upgrades planned by WAPA for the substation will be a great upgrade.
- At this same time, Lakota should consider making repairs and replacements on existing alternate feed.
- Community should also consider adding a second feeder from the normal feed into the community to help limit some risk.
- More discussion on this later.

Alternate Feed from WAPA

- Poles in need of inspection and some in need of repair.
- Needs to be completed prior to work being planned by WAPA.

Alternate Feed from WAPA

- Cross arms twisted, causes undo stress and increases failure risk.
- Neutral splice too close to pole, prone to failure.

Distribution Lines from WAPA Substation

- Alternate Feed (different transformer) – emergency feed into the community
  - Lakota should still keep maintenance up on this line so it will preform as needed when placed into service
  - Inspection and any needed repairs should be completed prior to work planned by WAPA
- Primary feed – underground circuit feeding the community
  - Under the Hwy #2, difficult to repair/replace
  - Could split loads up if there were issues on primary feed, avoid a complete shutdown of community to transition to alternate feed
  - Could work on upgrading the system to 7200/12470 and eliminating the 2400 volt Delta system

Distribution System Voltage
7200 Volt Y to 2400 volt Delta Substation

Distribution System Voltage
7200 Volt Y to 2400 volt Delta Substation

- The fence around this equipment needs to be moved farther out from the equipment for public safety along with better signage warning public to stay away from area.
- NESC Requirements

  Section 110 A for Substations: " A safety sign shall be displayed at entrances. For fenced electrical supply stations, a safety sign shall be displayed on each side. Section 411 D on Work Rules and signs: "Permanent warning signs shall be displayed in conspicuous places at all entrances to electric supply stations, substations, and other enclosed walk-in areas containing exposed current-carrying parts.

High School Transformer Problem

- Overheated secondary wire at High School transformer bank
- City Crews were informed of the problem before leaving town.

Secondary in Conflict with Primary

- Secondary wire needs to be lower than Primary wire to be worked on safely.
- Safety issue if primary falls into secondary, injecting high voltage into secondary.
- This is a code violation.

Newer Service Fire Hall Alley

- Secondary service unburied and not protected at base of pole.
- City crew is now aware of the problem, they will finish project before it gets mowed over.

Ave A & 6th West

- Cross arm being pulled off by transformer (arm going bad)

Bad pole behind 218 Main service problem

Bad pole behind 218 Main service problem

- Can see through pole to LP tank pole, because it is split dead center
- Service to this customer rubs the side of the building to service entrance
- When replacing pole move it to the south to help eliminate the service problem
- General issue - there are a number of poles within the community that are overdue for replacement and should be worked into budget

Vegetation Management – Tree Trimming

Some areas look like they are harder to address and need some attention before they start to cause major problems.

Underground system warning labels

- WARNING labels should be used on the outside of transformer enclosures, substations
- DANGER signs and labels for the inside of a transformer, for equipment on the inside of a substation and for towers. See appendix B of the NESC handbook.

Proper Labeling

Secondary disconnects on poles

- **NESC** Regulation 236 NESC regulation 236 states that climbing space around poles must be an unobstructed vertical space.
- Would recommend a secondary pedestal placed near the base of the pole with one triplex conductor on the pole feeding the pedestal and services feed out of the pedestal.

Review Recommendations

- High priority
  - Inspection and repair of alternate feed
  - Consider addition of 2nd circuit off normal feed into town
  - Direction on old substation – Voltage conversion or ??
  - Age and condition of poles
- Miscellaneous – largely centered around safety concerns
  - Labeling
  - Tree clearances
  - Secondary in primary area
  - Secondary disconnects
- Equipment – acquire Digger Derrick

Summary

- Approach to mitigate recommendations
  - Near term
  - Longer term
- Community approach on DM longer term
  - Community hire staff directly
  - MRES crew performs DM for the community
  - Contractor (city do one off bids/projects, consider development of contractor agreement for DM services)
  - Other

Next Steps

- Need input/feedback from community
- Budget estimates
- Further staffing discussion
- Timeline for next steps

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September 8, 2020

Amie S. Vasichek
City Auditor
PO Box 505
Lakota, ND 58344

Dear Amie:

Missouri River Energy Services (MRES) appreciates the opportunity to assist your community with the assessment of the distribution facilities. Thank you for your time assisting Jeff with the review completed in July. As a part of that review, we committed to providing you a written summary of our findings. This letter is intended to satisfy that commitment. In addition to the written summary, we will also be providing you a Power Point presentation with more detail to help you and your community better understand our findings and ultimately our recommendations.

As a part of the assessment, we would like to discuss the recommendations and how you would like to approach mitigation of our findings, and more specifically how MRES may be able to assist you in addressing those items. More detail can be found in Exhibit 1 to this letter.

1. WAPA – The upgrades WAPA has planned for the substation will be a good upgrade to the City of Lakota and will help maintain reliable service to the community.
   a. Alternate distribution line (emergency feed) – There appear to be significant issues with the facility. Specifically, there are poles that are in need of repair, cross arms are twisted. MRES considers this the *Highest Priority*.
   b. Primary distribution source into the community – Lakota should look at a second feeder into the community to help limit some of its potential exposure. MRES considers this a *Priority*.
2. Lakota 7200V Y to 2400V delta substation in town – Fence is too close to energized equipment and is a public safety concern. If the plans are to finish converting the town to 12470/7200 volt this will eliminate the problem altogether, but that may take time as budget permits work to be completed. MRES considers this a *High Priority*.
3. High school pole mounted transformers – There is a hot secondary phase feeding the high school. Staff was informed of the issue prior to leaving town. *MRES considers this a High Priority.*
4. Fire hall alley exposed secondary – There is an exposed secondary on new construction in fire hall alley. Staff was informed of the issue prior to leaving town. *MRES considers this a High Priority*.
5. Secondary wires mounted higher than primary – Numerous areas in the community with secondary wires mounted higher than primary, as this is a safety issue if the primary were to fall onto the secondary wires. MRES considers this a *Priority*.
6. Overall distribution pole condition – Numerous poles are in need of replacement. MRES considers this a *High Priority* due to the quantity of poles needing replacement.
7. Tree trimming – MRES considers this a *Priority.*
8. General items;

a. Safety warning/labels – There were few safety warning labels on equipment as required by NESC. MRES considers this a *Priority*.
b. Material – Based on our high level review, it appears the community has adequate material for normal operations and maintenance.
c. Major equipment – Digger Derrick – This is a critical piece of equipment and is needed for almost any basic maintenance work. MRES considers this a *High Priority.*
d. Staffing – MRES suggests the community further evaluate how to approach maintenance of the distribution system long-term going forward. To ensure reliability of the distribution system going forward, proactive distribution maintenance is needed. MRES considers this a *High Priority.*

We certainly understand it is your communities' decision whether and when to fund projects noted above. MRES wanted to relay these important items to you as regular maintenance and replacement of facilities, proper inventory, adequate equipment, and staffing are a critical part of your ability to maintain your communities' distribution system and important to ensure that reliability remains high, safety is addressed, and electricity prices remain competitive.

If you have any questions, please contact Terry Wolf at 800-678-4042 or email terry.wolf@mrenergy.com or contact Jeff Becthold at 605-321-7645 or email jeff.becthold@mrenergy.com.

Sincerely,

Terry Wolf
Manager, Transmission and Distribution Services

Jeff Becthold
Superintendent, Electric Distribution

Enclosure: Exhibit 1

Exhibit 1 – Recommended Approach to Issues Identified

1. Distribution lines from WAPA substation
   a. Alternate distribution line (emergency feed) – *Highest Priority* – MRES recommends you engage a distribution engineering firm to evaluate this facility. The review of this facility and repair will need to be completed prior to WAPA commencing work at the WAPA Lakota Substation in 2022 timeframe. Depending on recommendations from the engineering firm, MRES may be able to assist.
   b. Primary distribution source into the community – *Priority* – Lakota should look to engage a distribution engineering firm to evaluate this in conjunction with evaluation of the 7200/2400 distribution substation in town.
2. Lakota 7200V Y to 2400V delta substation in town – Engage distribution engineering firm to determine if voltage conversion or fence mitigation is preferred alternative. MRES can assist with review and analysis of study work, if desired.
3. High school pole mounted transformers – *High Priority* – Repair overheating secondary feeding high school with local staff.
4. Fire hall alley exposed secondary – *High Priority* – Bury the secondary utilizing local staff.
5. Secondary wires mounted higher than primary – *Priority* – These should be moved to mitigate any future potential safety issues, as staffing/budgeting allows. MRES could perform the task with coordination for materials, timing, etc., if desired, but would likely need to be done over a more extended time period. However, it may be better to work with a contractor to mitigate these over an extended period. If this latter alternative is chosen, MRES could help specify materials needed to complete the given projects.
6. Overall distribution pole condition – *High Priority* – MRES could perform the task with coordination for materials, timing, etc., if desired, but would likely need to be done over a more extended time period. However, it may be better to work with a contractor to mitigate these over an extended period. If this latter alternative is chosen, MRES could help specify materials needed to complete the given projects.
7. Tree trimming – *Priority* – Numerous areas in the community require tree trimming. These could be performed with local crews using a properly equipped truck.
8. General items;
   a. Safety warning labels – *Priority* – These should be installed by local staff.
   b. Material – Continue to monitor to ensure adequate material is available for routine maintenance.
   c. Equipment – Digger Derrick – *High Priority* – MRES can help specify and procure based on your needs and budgetary limitations. This type of equipment is readily available on the resale market. MRES recommends Altec Industries, Inc. as they have a used equipment division for bucket trucks and derricks called NEUCO. They generally have good prices and service for the area as they do have a service representative on the road out of Fargo he handled the repairs on the bucket and derrick in Barnesville, we have used NEUCO for Jackson, Lakefield, and Barnesville for used equipment and they have stood behind any work needed.
   d. Staffing – *High Priority* – MRES suggests the community further evaluate how to approach maintenance of the distribution system long-term going forward. The community should evaluate the following options: 1) hire qualified personnel directly by the community, 2) pursue an arrangement with third party like MRES to perform distribution maintenance (possible in cooperation with a neighboring community, 3) develop a maintenance agreement with a local contractor or electric cooperative. MRES is willing to assist your community in evaluating these alternatives.