BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE 345 kV SANDSTONE SWITCHING STATION AND ASSOCIATED FINDINGS REGARDING NOISE AND MAGNETIC FIELD REASONABLENESS	**)**	**PROCEEDING NO. 24A-_____E**

DIRECT TESTIMONY AND ATTACHMENTS OF AARON D. WILSON

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

March 19, 2024

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE 345 kV SANDSTONE SWITCHING STATION AND ASSOCIATED FINDINGS REGARDING NOISE AND MAGNETIC FIELD REASONABLENESS	**)**	**PROCEEDING NO. 24A-_____E**

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DIRECT TESTIMONY AND ATTACHMENTS OF AARON D. WILSON

I. INTRODUCTION, QUALIFICATIONS, PURPOSE OF TESTIMONY, RECOMMENDATIONS, AND ATTACHMENTS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Aaron D. Wilson. My business address is 1800 Larimer Street, Denver, Colorado.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?

A. I am employed by Xcel Energy Services Inc. ("XES") as Senior Manager, Substation Engineering. XES is a wholly owned subsidiary of Xcel Energy Inc. ("Xcel Energy") and provides an array of support services to Public Service Company of Colorado ("Public Service" or the "Company") and the other utility operating company subsidiaries of Xcel Energy on a coordinated basis.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?

A. I am testifying on behalf of Public Service.

Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.

A. As Senior Manager, Substation Engineering, I am responsible for managing the Company's engineering and design functions for substations to ensure a reliable and cost-effective electric system. A description of my qualifications, duties, and responsibilities is set forth in my Statement of Qualifications at the conclusion of my testimony.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to provide technical and engineering background to support the Company's Application for a Certificate of Public Convenience and Necessity ("CPCN") to construct, own, and operate the Sandstone Switching Station.

Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?

A. Yes, I am sponsoring Attachments ADW-1 through ADW-6, which were prepared by me or under my direct supervision. The attachments are as follows:

- Confidential Attachment ADW-1C: Sandstone Switching Station General Arrangement
- Confidential Attachment ADW-2C: Sandstone Switching Station One-line Diagram
- Confidential Attachment ADW-3C: Tundra Switching Station General Arrangement
- Confidential Attachment ADW-4C: Tundra Switching Station One-line Diagram

- Attachment ADW-5: Typical Transmission Structure – Power Pathway
- Confidential Attachment ADW-6C: Sandstone Switching Station Magnetic Field and Audible Noise Study

Q. WHAT RECOMMENDATIONS ARE YOU MAKING IN YOUR DIRECT TESTIMONY?

A. I recommend the Commission find the Sandstone Switching Station is reasonable, necessary, and in the public interest, and grant the Company a CPCN for the Sandstone Switching Station. I also recommend the Commission find that, consistent with Commission Rules 3206(e) and (f), the expected maximum noise and magnetic field levels associated with the Sandstone Switching Station are reasonable and require no further mitigation or prudent avoidance measures.

II. DESCRIPTION OF THE SANDSTONE SWITCHING STATION

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR DIRECT TESTIMONY?

A. In this section of my Direct Testimony, I provide a technical description of the Sandstone Switching Station.[1] I describe the differences between the configuration of Segments 4 and 5 with the inclusion of the Sandstone Switching Station and the original configuration set forth in the Company's Application for a CPCN for the Colorado's Power Pathway 345 kilovolt ("kV") Transmission Project (the "Pathway Project").

[1] A switching station is a type of substation that operates at a single voltage level (and, therefore, does not have transformers that change or "transform" voltage from one voltage level to another).

Q. PLEASE SUMMARIZE THE SANDSTONE SWITCHING STATION AND ITS IMPACT ON THE SCOPE OF THE PATHWAY PROJECT.

A. The proposed Sandstone Switching Station is located approximately 15 miles to the east of the existing Tundra Switching Station in Pueblo County, which will serve as the new point of connection between Segments 4 and 5. Segment 4 will still connect the May Valley Switching Station to the Tundra Switching Station but will now be bifurcated by the Sandstone Switching Station. As Company witness Ms. Heather Brickey explains, this change in scope is expected to provide relative cost savings for the Pathway Project and is expected to add value by providing additional generation resource interconnection points.

The addition of the Sandstone Switching Station will alter the scope of the Pathway Project as originally identified in Proceeding No. 21A-0096E (the "Pathway Project CPCN Proceeding"). The expected final configuration of the Pathway Project will have double circuit lines from the May Valley Switching Station to the Sandstone Switching Station (now referred to as Segment 4A) and from the Sandstone Switching Station to the Tundra Switching Station (now referred to as Segment 4B). Segment 5 will now consist of a double circuit line from Harvest Mile Substation to the new Sandstone Switching Station. The previously-planned expansion of the Tundra Switching Station has been scaled back in favor of the new Sandstone Switching Station. A vicinity map is included as Attachment HCB-1 to Ms. Brickey's Direct Testimony. Segment 4A will be 113 miles long and Segment 4B will be 17 miles long, for a total length of 130 miles, as compared to the 140 miles originally planned for Segment 4. Segment 5 will be

a total length of 129 miles, as compared to the 120 miles originally planned. I describe each of these components in more detail below.

Q. PLEASE PROVIDE A TECHNICAL DESCRIPTION OF THE SANDSTONE SWITCHING STATION.

A. The proposed Sandstone Switching Station is a 345 kV switching station located in Pueblo County, Colorado approximately 12 miles north-northeast of Boone, Colorado at the northeast corner of the intersection of Boone Road and Hodges Road. The planned parcel is approximately 95 acres in size. The initial graded area will be less than 40 acres, but the specific total graded area will be determined through the detailed design process. The Company is reserving area within the overall parcel for future expansion, to accommodate the potential installation of voltage control equipment, security, sound and magnetic field buffers, and stormwater detention facilities.

The initial arrangement of the switching yard will consist of eight bay positions. Two bay positions will terminate 345 kV lines to the May Valley Switching Station, two bay positions will terminate 345 kV lines to the Tundra Switching Station, two bay positions will terminate the 345 kV lines to the Harvest Mile Substation. Each of the Harvest Mile terminals will also have line-connected 345 kV, 60 MVAR-rated shunt reactors. Additionally, one bay position will connect to two new 345 kV, 120 MVAR-rated shunt capacitor banks and one bay position will connect to two new 345 kV, 60 MVAR-rated shunt reactors that were originally proposed to be located at the Tundra Switching Station. See Confidential

Attachment ADW-1C for a general arrangement of this site, and Confidential Attachment ADW-2C for a one-line diagram.

Q. PLEASE DESCRIBE THE WORK THAT WILL BE NECESSARY TO CONSTRUCT THE SANDSTONE SWITCHING STATION.

A. The Company will complete grading, fencing, foundations, equipment, structures, and bus work to support the installation and operation of the Sandstone Switching Station. Additional remote-end work, including relay and communications equipment, will be needed at the Tundra Switching Station. The scope of work on the Tundra Switching Station is within the scope of work approved in the Pathway Project CPCN Proceeding.

Q. PLEASE DESCRIBE HOW THE ADDITION OF SANDSTONE SWITCHING STATION ALTERS THE SCOPE OF THE TUNDRA SWITCHING STATION.

A. Construction of the Sandstone Switching Station allows for elimination of a significant portion of the planned expansion of the Tundra Switching Station from the scope of the approved CPCN for the Pathway Project. See Confidential Attachment ADW-3C for a general arrangement of this site, and Confidential Attachment ADW-4C for a one-line diagram. As shown in these attachments, the Tundra Switching Station will now require only two additional breaker-and-a-half rungs.[2] These new rungs, in conjunction with the completion of two existing partially-built rungs create five new 345 kV bay positions. Two bay positions will

[2] The original plan for Tundra Switching Station set forth in the Pathway Project CPCN Proceeding included four additional breaker-and-a-half rungs. Those new rungs, in conjunction with the completion of two existing partially-built rungs would have created seven new 345 kV bay positions. See Proceeding No. 21A-0096E, Hr. Ex. 106, Direct Testimony of Byron R. Craig, at 24:6-25:2.

terminate 345 kV lines to the Sandstone Switching Station (Segment 4B), two bay positions support intercepting the existing 345 kV Daniels Park to Comanche line (7017), and one bay position will connect two new 345 kV, 120 MVAR shunt capacitor banks.[3]

Q. HOW DOES ADDITION OF THE SANDSTONE SWITCHING STATION CHANGE THE ENGINEERING OF THE PATHWAY PROJECT TRANSMISSION LINES?

A. The addition of the Sandstone Switching Station does not significantly alter the Company's engineering design of the Segment 4 and 5 transmission lines, and the technical characteristics of the approved transmission lines remain unchanged. The Company is not seeking Commission authorization of these engineering-level changes to the scope of the Pathway Project but provides them as important context for the Sandstone Switching Station. While Segment 4 will be bifurcated by the Sandstone Switching Station, the technical characteristics of transmission line Segments 4A, 4B, and 5 are the same as described in the Pathway Project CPCN Proceeding. A typical structure drawing is provided as Attachment ADW-5 to my Direct Testimony.[4] Small to medium angle structures will also be single pole with a similar geometry. Dead-end structures and large angles will be two pole structures, one for each circuit, which is generally more cost-effective than one larger structure. All structures will be installed on reinforced concrete drilled piers.

[3] These latter two line terminals are associated with establishing another interconnection between the existing transmission network and the Tundra Switching Station. The 345 kV Daniels Park to Comanche line (7015) was intercepted and brought into the Tundra Switching Station as a part of the original construction of the switching station.

[4] Attachment ADW-5 was originally provided as Hr. Ex. 106, Attachment BRC-1 to the Direct Testimony of Byron R. Craig in the Pathway Project CPCN Proceeding.

This structure configuration is commonly used for the transmission systems throughout Xcel Energy's entire eight-state service territory footprint and is also consistent with common electric utility industry practice across the United States. But for the differences in circuit lengths, the transmission line design for Segments 4A, 4B, and 5 has no significant changes compared to the original transmission line segments on the Pathway Project identified in the Pathway Project CPCN Proceeding.

Q. HOW DID THE COMPANY DESIGN THE SANDSTONE SWITCHING STATION, FROM AN ENGINEERING PERSPECTIVE?

A. The transmission line and substation engineering teams developed preliminary designs and cost estimates for the Pathway Project in conjunction with the Company's siting and routing activities. Consistent with the project development process, additional information was obtained and considered, prior assumptions were confirmed, and conceptual designs were optimized to enhance constructability and control costs.

Q. WHAT IS THE TECHNICAL PURPOSE AND NEED FOR THE SANDSTONE SWITCHING STATION?

A. As Ms. Brickey explains, in the project development process for the Tundra Switching Station expansion plan, the Company identified a significant limitation which would substantially increase the cost and degree of difficulty involved in the construction of those improvements. The proximity of a third-party development, the Neptune solar farm and collector substation, makes expansion of the Tundra Switching Station site to the east very challenging, if not impossible. The

engineering team had not identified a conflict with the adjacent property when the Tundra Switching Station expansion was conceived. Obtaining land used by the Neptune facility in order to expand the Tundra Switching Station came with significant risks for negative impacts on cost and schedule. Additionally, the routing of the planned May Valley to Tundra and Harvest Mile to Tundra segments was significantly complicated by the locations and arrangements of the Neptune solar array. As Ms. Brickey also details, there were other land use restrictions and challenges that make routing to the north and to the east of the Tundra Switching Station very difficult. The need for the Sandstone Switching Station is, in part, driven by those limitations on expansion of the Tundra Switching Station. The changes in land use and ownership surrounding the Tundra Switching Station parcel significantly limited the cost-effective options for its expansion.

The Sandstone Switching Station will provide an interconnection point for the lines to May Valley and Tundra Switching Stations and the Harvest Mile Substation. This interconnection point enhances diversity of paths between the generation in eastern Colorado and the load centers, thereby increasing the reliability of the transmission system. Another purpose is to provide increased flexibility and capacity for future interconnections into the transmission system. The planned ultimate capacity for eight additional bay positions to enable the interconnection of generation resources, transmission lines, or special equipment[5]

[5] Special equipment, in this context, refers to Synchronous Condensers, STATCOMs, and/or series capacitors. Depending on the operating characteristics of the grid resulting from the transition from synchronous generation facilities to clean energy producers, this equipment may be needed in the future to help ensure reliable operation of the transmission system.

necessary for the reliable operation of the transmission system, coupled with the expected greater availability of potential new transmission corridors into the site, will allow more and easier interconnections for future generation resources.

Q. HOW DOES THE SANDSTONE SWITCHING STATION COMPARE TO THE TUNDRA SWITCHING STATION CONFIGURATION, AS CONTEMPLATED IN THE PATHWAY PROJECT CPCN PROCEEDING?

A. Compared to the previously contemplated Tundra Switching Station configuration, the proposed Sandstone Switching Station configuration provides increased future expansion capability, greater flexibility for routing of future generation facility tie lines, enhanced potential for future special equipment (if needed), and simplified construction. As I previously noted, Sandstone Switching Station has space for up to eight future generation interconnections while the Tundra Switching Station general arrangement indicated only two possible future interconnections[6] and more challenging line routing considerations. The westernmost of those two future bay positions in the prior Tundra Switching Station plan, due to its location relative to the existing and planned transmission lines, would have required substantial work and cost to terminate. The locations of the future bay positions in the Sandstone Switching Station ultimate arrangement will facilitate future connections to lines approaching the station from most directions, without requiring rebuilding or re-termination of existing transmission lines.

[6] Proceeding No. 21A-0096E, Hr. Ex. 106, Direct Testimony of Byron R. Craig, at 24:18-19.

Q. FROM AN ENGINEERING STANDPOINT, PLEASE ELABORATE ON THE BENEFITS OF THE SANDSTONE SWITCHING STATION OVER THE CONFIGURATION OF THE TUNDRA SWITCHING STATION IDENTIFIED IN THE PATHWAY PROJECT CPCN PROCEEDING.

A. The buffer between the proposed Sandstone Switching Station parcel boundary and the developed switching station area provides options for accommodating connections between future transmission corridors approaching the switching station and the available bay positions. The lack of usable buffer between the Tundra Switching Station and its parcel boundary, as well as the proximity of existing transmission corridors, significantly limit the flexibility and feasibility of additional transmission lines that can interconnect with the Tundra Switching Station.

The size and configuration of the Sandstone Switching Station parcel allows space for installation of special equipment within the proposed parcel boundary. Though sizes and quantities have not yet been finalized, it is expected that installation of shunt reactors and shunt capacitors will be required at the Sandstone Switching Station. The larger available space compared to the Tundra Switching Station will allow greater flexibility for siting this equipment. Given that the Company and State's transition to clean energy sources may require special equipment to support transmission system operation as noted above, and the incremental cost and ease of procuring additional land now compared to in the future, the Company considered it reasonable and in the public interest to accommodate potential future equipment.

Q. HOW DOES THE SANDSTONE SWITCHING STATION COMPARE WITH THE TUNDRA SWITCHING STATION IN TERMS OF SITE DEVELOPMENT?

A. Site development for the Sandstone Switching Station parcel is expected to be significantly easier and less costly than the prior plan for expansion of the Tundra Switching Station. The topography and other site constraints are less extreme than those present at the Tundra Switching Station. To develop the original plan for the Tundra Switching Station, it would have required a significant amount of grading cut and fill, relocation of a detention pond, and the probable installation of a significant retaining wall.

Q. CONSISTENT WITH RULE 3206(g), TO THE EXTENT THERE ARE ANY SERVICE CONNECTIONS THAT INTERCONNECT WITH THE PATHWAY PROJECT, WILL PUBLIC SERVICE INSTALL AND MAINTAIN SUCH SERVICE CONNECTIONS CONSISTENT WITH THE COMPANY'S TARIFF?

A. Yes. Commission Rule 3206(g) provides:

> Service connections. The utility shall install and maintain service connections from transmission extensions, which is any construction of transmission facilities and appurtenant facilities, including meter installation facilities (except meters) that is connected to and enlarges the utility's transmission system and is necessary to supply transmission service to one or more additional customers, consistent with conditions contained in the utility's tariff.

Public Service will comply with its tariffs to the extent applicable as set forth in Rule 3206(g).

III. MAGNETIC FIELDS AND NOISE ANALYSIS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section of my Direct Testimony, I describe the results of the magnetic field and noise studies Public Service has conducted pursuant to Rules 3206(e) and (f) for the Sandstone Switching Station.

Q. PLEASE SUMMARIZE THE COMMISSION'S RULES ADDRESSING MAGNETIC FIELD AND NOISE LEVELS FOR PROJECTS INVOLVING CONSTRUCTION OR EXPANSION OF TRANSMISSION FACILITIES.

A. Sections (e) and (f) of Rule 3206 direct a CPCN applicant to evaluate the expected maximum level of magnetic fields and projected level of noise from a proposed project involving construction or expansion of transmission facilities. Rule 3206(e)(III) provides that a proposed magnetic field level at the edge of the transmission line right of way ("ROW") or substation boundary of 150 milliGauss ("mG") or below is "deemed reasonable by rule and need not be mitigated to a lower level."

Rule 3206(f) requires CPCN applications for transmission projects to include the projected level of noise radiating beyond the property line or right-of way (as applicable) at a distance of 25 feet. Rule 3206(f)(II) provides noise-level thresholds in decibels on the A-weighted scale ("dB(A)") for which the noise will be deemed reasonable by rule for different zoning designations, as shown in Table ADW-D-1 below. Additionally, under Rule 3206(f)(III), a projected noise level of 50 dB(A) or below is deemed reasonable and "will not be subject to further review regardless of the use of the land."

Q. WHAT NOISE LEVELS DOES RULE 3206(f)(II) DEEM REASONABLE BY RULE?

A. Rule 3206(f)(II) sets forth noise levels by zoning designation that are deemed reasonable by rule and do not require mitigation. The Rule requires that utility standard programs provide data for the noise study, employing the assumption that the proposed facility is operating at its highest continuous design voltage under L_{50} rain conditions. The reasonable noise thresholds are as follows for four standard zoning areas:

Table ADW-D-1 – Reasonable Noise Levels by Zone

Zone	Reasonable Noise Level
Residential	50 dB(A)
Commercial	55 dB(A)
Light Industrial	65 dB(A)
Industrial	75 dB(A)

Q. WHAT IS THE LAND USE DESIGNATION FOR THE SANDSTONE SWITCHING STATION?

A. The Sandstone Switching Station parcel location is zoned Agricultural-1 by Pueblo County. The surrounding land is also zoned Agricultural-1.

Q. HAS THE COMPANY EVALUATED MAGNETIC FIELD AND NOISE ASSOCIATED WITH THE SANDSTONE SWITCHING STATION?

A. Yes. Public Service engaged POWER Engineers, Inc. ("POWER Engineers") to evaluate the expected magnetic fields and audible noise effects for the Sandstone

Switching Station. The expected effects for the transmission lines were previously evaluated and presented in the Pathway Project CPCN Proceeding. The Sandstone Switching Station Magnetic Field and Audible Noise Study Report ("Report"), provided as Confidential Attachment ADW-6C to my testimony, includes an analysis of the projected audible noise level that would radiate beyond the switching station property lines at a distance of 25 feet as required by Rule 3206(f). The Report also modeled the expected maximum level of magnetic fields that could be experienced under design conditions at the switching station boundaries at a location one meter above the ground.

Q. DID THE COMPANY EVALUATE THE AUDIBLE NOISE AND MAGNETIC FIELDS ASSOCIATED WITH TRANSMISSION LINE FACILITIES FOR THE PATHWAY PROJECT?

A. Yes. That analysis was provided as Attachment BRC-8 to Hearing Exhibit 106, the Direct Testimony of Company witness Byron R. Craig, in the Pathway Project CPCN Proceeding. The Company has not re-evaluated the audible noise and magnetic fields of the Pathway Project transmission lines as the scope changes described in this Application will not alter the findings contained in that report.

Q. PLEASE EXPLAIN HOW AUDIBLE NOISE WAS MEASURED FOR THE SANDSTONE SWITCHING STATION.

A. Audible noise is measured as an equivalent A-weighted sound-pressure level in decibels (i.e., dB(A)). The audible noise effects were analyzed through acoustic modeling of the switching station using utility standard software. For the Sandstone Switching Station, the audible noise effects are driven by the maximum

sound pressure of the reactors. The values of these effects were calculated at points 25 feet from the switching station property line. The receptor height placement is modeled at 1.5 meters (4.9 feet) to approximate the height of an individual's ear. The methodology used by POWER Engineers is described in more detail in the Report.

Q. PLEASE EXPLAIN HOW MAGNETIC FIELDS WERE MEASURED FOR THE SANDSTONE SWITCHING STATION.

A. The magnetic field effects were modeled using utility industry standard software that allows for modeling of the bus work (typically horizontal conductors and vertical conductors) in three dimensions at an energization that represents the worst-case magnetic field strengths (i.e., the highest EMF values) that can be produced outside of the bus zone if all the bus conductors carry their maximum current rating. Consistent with Rule 3206(e), the magnetic field is analyzed and reported at a height of one meter above the ground. The methodology used by POWER Engineers is described in more detail in the Report.

A. <u>Magnetic Field Analysis</u>

Q. PLEASE SUMMARIZE THE RESULTS OF THE ANALYSIS OF MAGNETIC FIELDS FOR THE SANDSTONE SWITCHING STATION.

A. The analysis was performed by energizing the buses to their maximum rating. To this end, vertical and horizontal buses were energized to carry the maximum steady state current rating of 3,000 amperes in the same directions. It is worth mentioning that this energization scheme may not be physically feasible given that currents will split at bus nodes. Therefore, this energization represents the worst-

case magnetic field strengths (i.e., the highest EMF values) that can be produced outside of the bus zone if all the bus conductors carry their maximum current rating. Table ADW-D-2 below shows a summary of the magnetic field strength values at the fence line and property line for the new Sandstone Switching Station. Values are calculated at a height of one meter above the ground per IEEE Std 644-2019 and consistent with Rule 3206(e). The magnetic field strength levels at each of the proposed fence lines for the Sandstone Switching Station are below the 150 mG magnetic field level deemed reasonable by Rule 3206(e).

Table ADW-D-2 – Sandstone Switching Station Magnetic Field Strength

Station Fence Line Location	Magnetic Field at Edge of Fence Line [mG]	Magnetic Field at Edge of Property Line [mG]
Magnetic Field Deemed Reasonable Level (Rule 3206)	*150*	*150*
Maximum Northern Fence Line	20.8	1.1
Maximum Eastern Fence Line	130.1	4.9
Maximum Southern Fence Line	78.7	0.4
Maximum Western Fence Line	104.1	12.7

Q. DID THE COMPANY ENGAGE IN A PRUDENT AVOIDANCE INQUIRY WITH RESPECT TO EXPOSURE TO MAGNETIC FIELDS RESULTING FROM THE SANDSTONE SWITCHING STATION?

A. No. As described above, the magnetic field levels are not projected to exceed the 150 mG threshold deemed reasonable by Rule 3206(e)(III). Accordingly, prudent avoidance is not required.

Q. WHAT SHOULD THE COMMISSION FIND WITH RESPECT TO THE PROJECTED MAGNETIC FIELDS ASSOCIATED WITH THE SANDSTONE SWITCHING STATION?

A. The Company requests the Commission find the expected magnetic field levels associated with the Sandstone Switching Station to be reasonable because the projected magnetic field levels at the applicable locations associated with the Sandstone Switching Station fall below 150 mG, which is deemed reasonable by Rule 3206(e)(III).

B. <u>Audible Noise Analysis</u>

Q. WHAT EQUIPMENT WILL CAUSE NOISE AT THE SANDSTONE SWITCHING STATION?

A. The predominant cause of noise at the Sandstone Switching Station will be the reactors. Other noise-making equipment such as transformers are not included in the scope of the Sandstone Switching Station. Corona from transmission lines will also be a source of noise but will be minimal compared to noise from reactors.

Q. PLEASE SUMMARIZE THE RESULTS OF THE ANALYSIS OF AUDIBLE NOISE LEVELS FOR THE SANDSTONE SWITCHING STATION.

A. POWER Engineers conducted a noise analysis for the Sandstone Switching Station based on the methodology described above, using the planned parcel for the Sandstone Switching Station. The results of POWER Engineers' noise analysis for each site are set forth in the Report. Table ADW-D-3 below provides a summary of the results presented in the Report.

Table ADW-D-3 – Sandstone Switching Station Audible Noise Levels

Switching Station Property Line Location	**Audible Noise 25 Feet from Property Line [dB(A)]**
Audible Noise Deemed Reasonable Level (Rule 3206)	*None established by Rule 3206(f)*
25 feet from Northern Property Line	58.1
25 feet from Eastern Property Line	58.4
25 feet from Southern Property Line	48.0
25 feet from Western Property Line	57.6

Q. WHAT DOES THE COMPANY REQUEST THE COMMISSION FIND WITH RESPECT TO THE AUDIBLE NOISE LEVELS ASSOCIATED WITH SANDSTONE?

A. The Company requests the Commission find the audible noise levels associated with the Sandstone Switching Station to be deemed reasonable by rule and require no further mitigation. The Sandstone Switching Station is located on land with a zoning designation of Agriculture. Consistent with recent Commission decisions concerning transmission and substation facilities located on land with a zoning designation of Agricultural,[7] projected noise should be deemed reasonable for Agricultural zones if it is within the noise level deemed reasonable for Light Industrial zones. The projected noise from Sandstone Switching Station should be found reasonable where the projected noise and the predominant land uses in

[7] See Proceeding No. 21A-0096E, Decision No. C22-0270, at ¶ 70 (mailed June 2, 2022); Proceeding No. 18A-0905E, Decision No. C19-0367, at ¶ 43 (mailed Apr. 25, 2019); Proceeding No. 18A-0860E, Decision No. C19-0175, at ¶ 17 (mailed Feb. 19, 2019).

the area are consistent with the noise level deemed reasonable for Light Industrial zone under Rule 3206(f)(II).

IV. CONCLUSION

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. I recommend the Commission grant a CPCN for the Sandstone Switching Station as described in my Direct Testimony. I also recommend the Commission find that the projected noise levels and maximum magnetic field levels associated with the Sandstone Switching Station are reasonable and that no further mitigation measures are necessary.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Statement of Qualifications

Aaron D. Wilson

Mr. Wilson is currently the Sr. Manager of Substation Engineering & Design for Colorado in Xcel Energy's Electric Transmission organization. His organization provides engineering design and procurement activities enabling the execution of Xcel Energy's substation capital portfolio for Public Service Company of Colorado and the other Xcel Energy operating companies.

Mr. Wilson has over 34 years of experience in the electric power industry, including general management, business development, project management, customer relations, technical instruction, design, standards, and procurement. He has provided strategic direction as well as engineering and project management for a broad range of utility programs, projects, and studies associated with substations and transmission, including facilities through 500 kV.

Mr. Wilson holds a Bachelor of Science degree in Electrical Engineering from Iowa State University. He is a registered professional engineer in Oregon and Minnesota.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE 345 kV SANDSTONE SWITCHING STATION AND ASSOCIATED FINDINGS REGARDING NOISE AND MAGNETIC FIELD REASONABLENESS	)	**PROCEEDING NO. 24A-_____E**

AFFIDAVIT OF AARON D. WILSON
ON BEHALF OF
PUBLIC SERVICE COMPANY OF COLORADO

I, Aaron D. Wilson, being duly sworn, state that the Direct Testimony and attachments were prepared by me or under my supervision, control, and direction; that the Direct Testimony and attachments are true and correct to the best of my information, knowledge, and belief; and that I would give the same testimony orally and would present the same attachments if asked under oath.

Dated at Denver, Colorado, this 13th day of March, 2024.

Aaron D. Wilson
Senior Manager, Substation Engineering

Subscribed and sworn to before me this 13th day of March, 2024.

Holly A. Mashburn
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20214014663
MY COMMISSION EXPIRES April 13, 2025

Notary Public

My Commission expires April 13, 2025