TO: COMMISSIONERS AND ADVISORS

FROM: AMANDA REISS, KRISTEN EDWARDS, DARREN KEARNEY, JON THURBER, AND ERIC PAULSON

SUBJECT: OBJECTIVITY OF ACOUSTICAL CONSULTANTS AND COST OF SOUND TESTS

DATE: SEPTEMBER 22, 2022

STAFF MEMORANDUM

1.0 OVERVIEW

At the August 30, 2022, Commission meeting the Commission discussed a request from Greg Wall to conduct additional sound testing for the Crowned Ridge II Wind Farm (CRW II) during the fall of 2022 or winter of 2022/2023. Xcel Energy, the owner of CRW II, conducted sound testing during the summer of 2021 and filed a report on August 6, 2021, demonstrating that CRW II's sound levels complied with the permit limits.[1] Mr. Wall's concern raised during last month's Commission meeting was that the summer study is not representative of CRW II's sound levels in late fall or winter. While discussing the matter, Mr. Wall and others raised additional concerns about the objectivity of the findings found in the August 2021 sound report since Xcel Energy contracted with the consultant that conducted the sound test.[2] After further discussion, Xcel Energy voluntarily agreed to conduct another sound test in the fall. To address the objectivity concerns raised during the meeting, the Commission instructed Staff to hire an expert to oversee the sound test and perform an independent analysis of the data collected by Xcel Energy's consultant.

The purpose of this memorandum is to provide additional support for Staff's view that acoustical consultants contracted by project owners should be considered an objective, unbiased professional absent a clear demonstration to the contrary. In addition, Staff provides the estimated costs of a stound study so that all parties are aware of the costs incurred by project owners due to sound testing.

2.0 OBJECTIVITY OF ACOUSTICAL CONSULTANTS

Based upon our experience working closely with numerous expert witnesses across many dockets, it is Staff's opinion that expert acoustical consultants, like all other expert consultants and witnesses, with the proper credentials should be assumed to be objective and unbiased absent a clear showing to the contrary. Important consultant

[1] Sound level permit limits are set forth in Condition 26 of the Final Decision and Order Granting Permit to Construct Facility issued on April 6, 2020, for Crowned Ridge Wind II and found in docket EL19-027.
[2] RSG completed the sound testing for Xcel Energy in the summer of 2021.

credentials include the education, training, and work experience that is required for the acoustical consultant to hold themselves out as an expert. Further, a consultant's membership in professional trade associations help ensure there is a level of standardization and professionalism in the work the consultant performs. Finally, the Commission has crafted permit conditions to limit the amount of professional judgment inserted in sound level compliance testing to ensure test results will be reliable. All these factors are described in more detail below.

2.1 Acoustical Consultant Credentials

Acoustical consultants that have conducted field sound tests in South Dakota for energy facility permits have had the education, training, and work experience that qualifies them as experts. Employees of the consultants have engineering degrees with additional training and/or work experience in the noise control field. A review of a consultant's curriculum vitae is one tool Staff uses to verify that the consultant has the demonstrated knowledge along with the experience to produce an objective result. If a consultant's credentials show they have the knowledge and work experience across a wide range of clients, Staff finds it difficult to jump to the conclusion that the consultant is biased simply because they were contracted by the project owner.

2.2 Professional Trade Associations

Firms that conduct sound tests are professional consultants that follow industry standards. Acoustical consultants are typically members of professional associations such as the Acoustical Society of America (ASA), the Institute of Noise Control Engineering (INCE) and/or the National Council of Acoustical Consultants (NCAC).[3] The purpose of these professional associations are: 1) to provide individuals participating in the field with access to education and technical advancement and 2) to recognize expert acoustical consultants and engineers (e.g. INCE's Board Certification).[4,5]

In addition to having the proper credentials noted in section 2.1 above, Staff believes an acoustical consultant's membership in a professional trade association helps ensure professional judgement is applied consistent with industry expectations. This is particularly true if the consultant has employees that are Board Certified by INCE which requires the employees to pass a professional examination, meet certain education requirements, and gain approval from INCE's Board.[6] Absent a clear demonstration that a consultant, or an employee of a consultant, has a history of authoring biased sound

[3] For example, RSG has employees that are members of both INCE and NCAC.
[4] See INCE's Mission Statement at: https://www.inceusa.org/about-ince-usa/about-the-institute/.
[5] See NCAC's about page and Canon of Ethics at: https://ncac.com/about-us/.
[6] See INCE's Board Certification Requirements at: https://www.inceusa.org/board-certification/requirements/.

test reports, Staff cannot support the assumption that professional consultants are presenting improper reports and conclusions to the Commission for sound tests.[7]

2.3 The Acoustical Consultant Field

Acoustical consultants specialize, through education and work experience, in a specific area of engineering and acoustics. This specialization creates a relatively small number of firms and individuals performing the work in the field. Should an acoustical consultant manipulate data on behalf of their clients, Staff believes it would quickly become known in the universe of acoustical consultants. Once that specific consultant is outed as not following standard industry practices and manipulating data, Staff believes that there would be little incentive for a project owner to hire that consultant for work that could be subject to regulatory, or potentially legal, scrutiny.[8] The question here is why would an entity hire a consultant that would have credibility issues before a regulatory body or court?

Staff notes that the potential loss of professional credibility for an acoustical consultant, and the future loss of revenues associated with such, is incentive for an acoustical consultant to provide an objective analysis of sound levels to the best of that consultant's professional abilities. Conducting sound tests at wind farms is not a consultant's only source of revenue. These firms also test at other sources of noise and perform a wide range of work in the field of noise control engineering for many different clients. It is difficult for Staff to believe that a consultant would jeopardize their credibility by reporting a certain desired outcome at one specific project when doing so would put all the other lines of that consultant's business at risk.

2.4 Controls Set in the Sound Level Test Permit Condition

As noted earlier in section 2.2 there is some amount of professional judgement used by a consultant when conducting a sound test and analyzing the data. In order to limit the amount of professional judgement inserted into a sound level compliance review, the Commission included a specific sound test methodology in wind energy facility permits.[9] This methodology sets forth the specific standards the acoustical consultant should use as well as the required method for processing the data. While there may remain a small amount of professional judgment in sound compliance testing, it is Staff's opinion that an acoustical consultant with the proper credentials would have little ability to drastically influence the test results based on how the permit condition is written.

[7] In fact, RSG and Xcel Energy self-reported to the Minnesota PUC a 1-hr period of concern observed during testing sound levels at Freeborn Wind Farm. See MN PUC Docket: IP-6946/WS-17-410.
[8] This is especially the case if the project owner routinely appears before the Commission.
[9] An example of the methodology can be found in Condition 26 of the Final Decision and Order Granting Permit to Construct Facility issued on April 6, 2020, for Crowned Ridge Wind II (docket EL19-027).

To further narrow the amount of professional judgment used in sound testing, the Commission has also required the formal review and approval of sound test protocols to be used by the acoustical consultants. It is during this review and approval process that the parties have the opportunity to critique the test protocol and raise any concerns that a party may have regarding the objectivity of the acoustical consultant. Staff notes that the only time the Commission has heard complaints regarding the objectivity of an acoustical consultant is after the final report shows the project complies with the permit limits.

3.0 COST OF SOUND TESTS

Hiring an acoustical consultant to conduct a sound level test comes with a cost. It is Staff's opinion that the Commission should consider in its decision-making process whether the arguments for requiring sound level testing justify the costs incurred by the project owner to conduct the test. In other words, the Commission should determine if sound level testing will provide meaningful data *for the Commission*[10] that would then justify the Commission ordering the utility to incur the cost of collecting that data.

3.1 Costs of Past Sound Testing

Over the past few years, Staff has observed that completing a field sound level test is not an immaterial amount of money. Staff surveyed Next Era Energy and learned that the cost of completing the sound level testing at Crowned Ridge I ranged from approximately $100,000 to $130,000 for each test. Xcel Energy reported that the cost of the summer 2021 sound test at Crowned Ridge II was approximately $60,000.

In addition to the costs incurred directly by the utility for their consultants, Staff's consultant also comes with a cost should independent oversight and data review be deemed necessary. For past sound level tests, Staff's consultant costs have ranged from approximately $10,000 to $33,000 per test.[11]

3.2 Who Ultimately Pays?

The Project Owner incurs the costs for sound level tests; however, these costs are not paid by shareholders of the company for all projects. If an electric utility owns a project (rather than purchasing the energy through a PPA), then the cost associated with sound level testing is passed on to that electric utility's customers. For example, since Xcel Energy owns Crowned Ridge II, costs associated with sound level testing would be paid for by Xcel Energy's customers.

[10] Staff intentionally used "Commission" here. An opponent of a project may never accept test results that show the project is in compliance no matter how many times the testing is completed.
[11] The higher end of the cost range occurred when the scope of work required the consultant to travel to the project site for monitoring equipment set-up.

3.3 Proposal Received for Independent Oversight of Fall 2022 Sound Study

At the August 30, 2022, Commission meeting, the Commission requested that Staff obtain an expert to oversee the sound level testing that Xcel Energy voluntarily agreed to do in the fall of 2022. Staff received a proposal from Hessler Associates, Inc. to do that work at estimated cost of $42,680.[12] Staff notes that the specific methodology for the fall 2022 sound testing has not yet been finalized and, thus, the actual costs to be invoiced by Hessler Associates, Inc. may be less than the proposal's estimate depending upon the number of locations tested.

4.0 CONCLUSION

Wind turbines emit noise that certain individuals find intrusive and annoying. As a result, the Commission attached sound level limits to wind energy facility permits for minimizing sound levels at residences. Pre-construction sound level modeling is conducted by project owners to site turbines in accordance with the Commission's permit limits. Actual sound level testing may be completed post-construction to ensure the project complies with the permit's sound limits.

Professional acoustical consultants conduct post-construction sound testing in accordance with the Commission's permit conditions and industry standards. These consultants are properly credentialed and members of professional trade associations. Given the relatively small universe of a specialized community of professional acousticians and engineers, Staff believes that there is little incentive, monetary or otherwise, for acoustical consultants to conduct sound level testing in bad-faith for one specific project and manipulate the test results. As such, it is Staff's opinion that results reported by a properly credentialed and reputable professional consultant should be trusted absent a clear demonstration to the contrary.

[12] Hessler Associates, Inc. Proposal dated September 7, 2022, is attached.