State of New York Adirondack Park Agency

In the Matter of the Application of

UNCONVENTIONAL CONCEPTS, INC. and MICHAEL HOPMEIER,

the Project Sponsors,

pursuant to section 809 of the Adirondack Park Agency Act.

NOTICE OF MOTION

APA Project No. 2021-0276

PLEASE TAKE NOTICE that upon the attached affirmation of Paul Van Cott, Esq., sworn to on January 20, 2026, and the exhibits attached thereto, the Adirondack Council, Inc. will move presiding Administrative Law Judge David Greenwood on February 4, 2026 at 10:00 a.m., or as soon thereafter as counsel may be heard, at the hearing in this matter to be held in the APA Boardroom at the Adirondack Park Agency ("APA") offices located at 1133 NYS Route 86 in Ray Brook, New York, for an Order disqualifying the law firm of Norfolk Beier PLLC from continued representation of the Project Sponsor in this matter in the absence of demonstrated compliance with 22 NYCRR Section 1200.1.11 of the Rules of Professional Conduct for New York attorneys pertaining to conflicts, including a conflict waiver from APA, and for such other and further relief as may be appropriate to protect the integrity of the hearing process in this matter and the interests of the Adirondack Council, Inc.

Dated: January 20, 2026

WHITEMAN OSTERMAN & HANNA LLP

BY: *Philip H. Gitlen*

Philip H. Gitlen, Esq.
Paul Van Cott, Esq.
Anna V. Seitelman, Esq.
Attorneys for Adirondack Council, Inc.

TO: Attached Service List

Service List
APA 2021-0276 Public Hearing
Unconventional Concepts, Inc. and Michael Hopmeier

Project Sponsor / Applicant Representatives

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Petitioners for Party Status

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David N. Greenwood
Administrative Law Judge
NYS DEC
Office of Hearings and Mediation Services
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Albany, New York 12233-1550

State of New York Adirondack Park Agency

In the Matter of the Application of

AFFIRMATION

UNCONVENTIONAL CONCEPTS, INC. and MICHAEL HOPMEIER,

the Project Sponsors,

pursuant to section 809 of the Adirondack Park Agency Act.

APA Project No. 2021-0276

PAUL VAN COTT, having been duly sworn, deposes and says:

1. I am *Counsel* to the law firm of Whiteman, Osterman & Hanna LLP, attorneys representing the Adirondack Council, Inc., which has been granted party status as an intervenor in the adjudicatory hearing in this matter pursuant to 9 NYCRR Part 580, and I have duly filed a notice of appearance for my involvement in the representation of the Adirondack Council, Inc. in this matter.

2. I have personal knowledge of the facts relevant to this motion, except as to those alleged upon information and belief, and make this affidavit in support of the relief requested in order to protect the rights and interests of the Adirondack Council, Inc., as a party in the Adirondack Park Agency ("APA") adjudicatory hearing in this matter, to reasonably expect that the integrity of the hearing has not been and will not be compromised by a conflict involving the Project Sponsor's attorneys, Norfolk Beier PLLC. Absent demonstrated compliance by Norfolk Beier PLLC with its ethical responsibilities under New York's Rules of Professional Conduct for attorneys in 9 NYCRR Part 1200, including APA's waiver of the conflict, disqualification of

Norfolk Beier PLLC from continued representation of the Project Sponsor in this adjudicatory hearing is warranted.

Background

3. By letter dated January 2, 2026, I advised the law firm of Norfolk Beier PLLC of a conflict in the firm's continued representation of the Project Sponsor in this matter and provided a copy of the letter to APA's executive director. A copy of our letter and its attachment are included as Exhibit A to this affidavit and made a part hereof.

4. This conflict arose from Norfolk Beier PLLC's having as a Senior Counsel to the firm a former APA attorney, Sarah Reynolds, who was personally involved in the APA's review of the Project Sponsor's application before joining Norfolk Beier PLLC.

5. According to a May 21, 2025 news story in the Adirondack Daily Enterprise, a copy of which is attached hereto as Exhibit B and made a part hereof, Sarah Reynolds had joined Norfolk Beier PLLC as of or before that date and had previously "spent nearly 20 years as an attorney with New York state's Adirondack Park Agency, where she managed the interpretation and administration of the park's environmental and land-use laws. Reynolds was responsible for guiding applicants, employees and board members through the review process for the most complex subdivision and development proposals presented to the Agency."

6. Ms. Reynolds work as an APA attorney included her direct and extensive involvement in APA's review of the Project Sponsor's application, as reflected in the 20-page, May 8, 2024 memorandum submitted by her to the APA Board's Regulatory Programs Committee in opposition to a February 2024 appeal to the APA Board of a staff request for information in this matter. The appeal, a copy of which is attached hereto as Exhibit C and made a part hereof, was

submitted by Norfolk Beier PLLC on behalf of the Project Sponsor Ms. Reynolds made a presentation to the Regulatory Programs Committee in furtherance of APA staff's opposition to the appeal submitted by Norfolk Beier PLLC. A video of this presentation is found on the APA's website at: https://vimeo.com/showcase/11632607?video=1065189837.

7. Notwithstanding Ms. Reynolds having joined Norfolk Beier PLLC as Senior Counsel in May 2025 after her direct participation as an APA attorney in the agency's review of the Project Sponsor's application in this matter, which created this conflict with respect to Norfolk Beier PLLC's continued representation of the Project Sponsor, Norfolk Beier PLLC has continued that representation.

8. Upon information and belief, Norfolk Beier PLLC has never complied with its ethical responsibilities for resolving this conflict under the New York Rules of Professional Conduct for attorneys provided in 22 NYCRR § 1200.1.11 (hereafter, "Rule 1.11"), entitled "Special Conflicts of Interest for Former and Current Government Officers and Employees," by obtaining a required waiver from APA for its continued representation of the Project Sponsor in this matter.

9. Our firm's January 2, 2026 letter to Norfolk Beier, PLLC provided notice of this conflict, as well as an opportunity for Norfolk Beier PLLC to demonstrate its compliance with its ethical duties under New York's Rules of Professional Conduct by providing or obtaining a waiver of the conflict from APA. Our letter sought a response from Norfolk Beier PLLC by January 9, 2026 regarding how the firm intended to resolve this conflict and noted that, absent a response, a motion might follow in the adjudicatory hearing in order to protect the integrity of the hearing process and our client's interests in that regard.

10. To date, Norfolk Beier PLLC has not provided any substantive response to our firm's January 2, 2026 letter, nor has APA, copied on our letter, indicated that it has waived the conflict, unfortunately leading to the necessity of our making this motion in order to seek resolution of Norfolk Beier PLLC's conflict involving its continued representation of the Project Sponsor in this matter prior to the scheduled February 4, 2026 start of the adjudicatory hearing.

The Norfolk Beier PLLC Conflict

11. Pursuant to Public Officer's Law § 73(8)(a) and Rule 1.11(a) of New York's Rules of Professional Conduct for attorneys, Sarah Reynolds is prohibited from any involvement in Norfolk Beier PLLC's representation of the Project Sponsor in this matter due to her having been an APA attorney. Pursuant to Rule 1.11(b), this prohibition extends to Norfolk Beier PLLC's representation of the Project Sponsor in this matter absent full compliance with the requirements of Rule 1.11, notice of the conflict to the APA, and a waiver of the conflict by APA.

12. Public Officer's Law § 73(8)(a)(ii) imposes post-employment restrictions on Ms. Reynolds, as a former APA attorney, including a lifetime prohibition against any involvement in this matter, as follows:

> *No person who has served as a state officer or employee shall after the termination of such service or employment appear, practice, communicate or otherwise render services before any state agency or receive compensation for any such services rendered by such former officer or employee on behalf of any person, firm, corporation or other entity in relation to any case, proceeding, application or transaction with respect to which such person was directly concerned and in which he or she personally participated during the period of his or her service or employment, or which was under his or her active consideration.*

13. Rule 1.11(a)(ii) of the Rules of Professional Conduct imposes a parallel ethical obligation upon Ms. Reynolds, as a former APA attorney, that separately prohibits her involvement in any representation of the Project Sponsor in this matter:

Except as law may otherwise expressly provide, a lawyer who has formerly served as a public officer or employee of the government….shall not represent a client in connection with a matter in which the lawyer participated personally and substantially as a public officer or employee, unless the appropriate government agency gives its informed consent, confirmed in writing, to the representation.

14. Accordingly, Ms. Reynolds is disqualified by Public Officer's Law § 73(8)(a)(ii) and Rule 1.11(a)(ii) from any representation of the Project Sponsor in this matter.

15. Unless Norfolk Beier PLLC obtained a waiver of the conflict from APA in a timely manner, Rule 1.11(b) of the Rules of Professional Conduct extended this disqualification to Norfolk Beier PLLC's continued representation of the Project Sponsor in this matter after Ms. Reynolds joined that firm on or before May 21, 2025. Rule 1.11(b) provides:

When a lawyer is disqualified from representation under paragraph (a), no lawyer in a firm with which that lawyer is associated may knowingly undertake or continue representation in such a matter unless the firm acts promptly and reasonably to: (1) notify, as appropriate, lawyers and nonlawyer personnel within the firm that the personally disqualified lawyer is prohibited from participating in the representation of the current client; (2) implement effective screening procedures to prevent the flow of information about the matter between the personally disqualified lawyer and the others in the firm; (3) ensure that the disqualified lawyer is apportioned no part of the fee therefrom; and (4) give written notice to the appropriate government agency to enable it to ascertain compliance with the provisions of this Rule, except that if the notice would disclose confidential information protected by Rule 1.6, then the notice may be temporarily postponed but shall be sent promptly after such confidential information is known to the government agency or is otherwise no longer protected by Rule 1.6.

16. Matthew Norfolk, a partner in Norfolk Beier PLCC serving as the Project Sponsor's authorized representative in this matter, had knowledge of Sarah Reynolds's prior involvement in this matter while she was an APA attorney. Although the full extent of their communications regarding this matter during her APA employment are not known, Mr. Norfolk submitted his client's appeal of staff's information request in this matter in February 2024 (attached hereto as Exhibit D and made a part hereof), which Ms. Reynolds responded to by her May 8, 2024 memorandum to the APA Board's Regulatory Programs Committee (See Exhibit C above).

Upon information and belief, Mr. Norfolk then replied directly to that memorandum (See Exhibit E attached hereto and made a part hereof) prior to the May 16, 2024 APA Board meeting (See link to materials provided to the APA Board for the May 16, 2024 meeting: https://apa.ny.gov/meeting/2024/05/regulatory.htm).

17. After hearing from both Ms. Reynolds (on behalf of APA staff) and Mr. Norfolk (on behalf of the Project Sponsor) at the May 16, 2024 APA Board meeting, the APA Board denied the Project Sponsor's appeal of staff's information request. A copy of the draft minutes of the May 16, 2024 APA Board meeting recording that denial is attached as Exhibit F hereto and made a part hereof. The APA Board adopted the May 16, 2024 meeting minutes at the APA Board's June 20, 2024 meeting. See video recording of the June 20, 2024 APA Board meeting at approximately ten minutes and thirty seconds into the meeting: https://vimeo.com/showcase/11632607?video=1065190368.

18. Despite his knowledge of Ms. Reynolds's extensive involvement in APA's review of the Project Sponsor's application, after she joined the firm in May 2025, Mr. Norfolk made at least two submissions to APA on behalf of the Project Sponsor while, upon information and belief, Ms. Reynolds was serving as Senior Counsel to Norfolk Beier PLLC. These submissions were received by APA on June 20, 2025 ("Response to 5th NIPA") and September 11, 2025 ("Response to 6th NIPA") and are attached hereto as Exhibit G. It is unknown whether Ms. Reynolds was involved in any way in these submissions, either directly or indirectly.

19. Notably, Mr. Norfolk's June 2025 Response to 5th NIPA responded to the same APA staff information request he had unsuccessfully appealed and that Ms. Reynolds had opposed on behalf of APA staff in 2024 while she was still employed as an attorney at APA.

20. Knowing Ms. Reynolds's prior involvement in this matter as an APA attorney, Norfolk Beier PLLC had an ethical obligation to timely comply with Rule 1.11 and to obtain APA's informed consent through a waiver of the conflict with respect to any continued representation of the Project Sponsor after Ms. Reynolds joined the firm on or before May 21, 2025.

21. Despite this obligation, there is no indication that Norfolk Beier PLLC ever complied with the "screening" and "notice" requirements of Rule 1.11, or obtained a waiver of the conflict from APA after Ms. Reynolds joined the firm in May 2025, despite the fact that Norfolk Beier PLLC continued its representation of the Project Sponsor in this matter, including but not limited to Norfolk Beier PLLC's response to an APA staff information request, submitted to APA after Ms. Reynolds joined Norfolk Beier PLLC, that Ms. Reynolds had previously been directly involved in defending as an APA attorney.

22. The apparent failure by Norfolk Beier PLLC to comply with Rule 1.11(b) with respect to this conflict is reflected in the lack of any substantive response from Norfolk Beier PLLC to our January 2, 2026 letter. Despite our request for a response by January 9, 2026, Norfolk Beier PLLC has not provided any indication that it has already obtained a waiver from APA or has complied or intends to comply with Rule 1.11 with respect to the firm's conflict in this matter.

23. Instead, the extent of Mr. Norfolk's response to our January 2, 2026 letter was a short email stating: "I'll look at what you sent, but the Council is not a party to the proceeding. It has no standing to raise any perceived conflicts." A copy of Mr. Norfolk's email is attached hereto as Exhibit H and made a part hereof.

24. Pursuant to New York's Rules of Professional Conduct, Norfolk Beier PLLC's ethical obligation to comply with Rule 1.11(b), including obtaining a waiver of the conflict from APA, attached when Sarah Reynolds, a former APA attorney with direct involvement in this matter on

behalf of APA, joined Norfolk Beier PLLC. If Norfolk Beier PLLC had previously complied with its Rule 1.11 ethical obligations and obtained a waiver from APA at any time after Ms. Reynolds joined that firm, Mr. Norfolk's could have simply responded to our January 2, 2026 letter by providing that information, avoiding the necessity of this motion.

25. Raising additional questions, subsequent to the inclusion in our January 2, 2026 letter of a link to the Norfolk Beier PLLC website that demonstrated Sarah Reynolds's status as a member of the firm, which I had personally observed prior to sending the letter, any reference to Sarah Reynolds has been eliminated from the firm's website, so it is not clear whether Ms. Reynolds is still even associated with the firm.

26. Even if Ms. Reynolds has recently left Norfolk Beier PLLC, the conflict pursuant to Rule 1.11(b) remains for the firm based on her having been there for whatever period of time she was there while the firm was still continuing its representation of the Project Sponsor in this matter without, upon information and belief, any compliance with the requirements of Rule 1.11 or waiver of the conflict by APA.

Need for Relief to Address the Norfolk Beier, PLLC Conflict

27. The potential for harm to the Adirondack Council, Inc.'s interests in this matter from Norfolk Beier LLC's conflict are substantial. Demonstrated compliance by Norfolk Beier PLLC with Rule 1.11 and APA's waiver of the conflict are required in order to protect the integrity of the adjudicatory hearing process in this matter.

28. The risk of harm to the Adirondack Council's interests and the integrity of the hearing in this matter is that other attorneys from Norfolk Beier PLLC may have gained or may gain factual, legal or other information from Ms. Reynolds, either directly or indirectly, based upon her prior involvement in APA staff's review of this matter during her tenure as an APA attorney.

This could even include information about the opinions of APA staff, APA executive staff or even APA Board members or designees regarding the Project Sponsor's application. Any such information gained by lawyers at Norfolk Beier PLLC regarding this matter, without other parties to the hearing having the same information, has the potential to undermine the integrity of the hearing because the parties would not all have the information gained by Norfolk Beier PLLC through its Senior Counsel, Ms. Reynolds. The potential risks for this to have occurred or to occur are exemplified by Ms. Reynolds having been a lawyer at Norfolk Beier PLLC at the time Mr. Norfolk responded to the same APA staff information request that both lawyers had worked on while Ms. Reynolds was still an APA attorney.

29. While we have no specific knowledge of any such information having been gained by any of the lawyers at Norfolk Beier LLC, Rule 1.11(b) requires firms with conflicts like Norfolk Beier PLLC's to undertake timely, proactive and effective measures when the conflict first arises to avoid the risks present here by effectively screening the former government attorney from any involvement, direct or indirect, intentional or otherwise, in the conflicted representation. The challenges of implementing and ensuring compliance with the requirements of Rule 1.11(b) for a smaller law firm like Norfolk Beier PLLC are noted in the comments accompanying the rule. There is no indication that Norfolk Beier PLLC undertook those measures in relation to this matter when Ms. Reynolds joined the firm or that they are even in place now.

30. Here, in order to avoid disqualification and to remedy its' apparently not having obtained a waiver from APA, Norfolk Beier PLLC must demonstrate full compliance with Rule 1.11 during the time of Ms. Reynolds's association with the firm to ensure, retroactively, that Norfolk Beier PLLC fully complied with those requirements. Further, if Ms. Reynolds is still associated with Norfolk Beier PLLC, compliance with the screening measures required by Rule 1.11(b)

would also apply for the duration of the firm's representation of the Project Sponsor in this matter.

31. Critically, even if the salutary measures required by Rule 1.11(b) are in place within a firm with a conflicted representation like Norfolk Beier PLLC's, Rule 1.11(b) also requires the former government attorney's agency, here APA, to consent to the firm's continued representation of the client in the matter where the conflict exists. APA's decision on Norfolk Beier PLLC's conflict in this matter would indicate whether or not APA is satisfied that Norfolk Beier PLLC has complied with and has measures in place to comply with Rule 1.11, and that as a result the risks of harm from the conflicted representation as noted above or otherwise have been and will be avoided.

32. The need for demonstrated compliance with Rule 1.11 and an APA decision on whether or not to grant a waiver of Norfolk Beier PLLC's conflict in this matter is even more critical because it does not appear that a waiver from APA was obtained in a timely manner before or after Ms. Reynolds joined Norfolk Beier PLLC or even as of the date of my January 2, 2026 letter. The elimination from the Norfolk Beier PLLC website of any reference to Ms. Reynolds after our firm's January 2, 2026 letter further underscores the need for a transparency and full disclosure by Norfolk Beier PLLC in this regard and justifies the reasonable relief sought through this motion.

33. Based upon the foregoing, it is respectfully submitted that disqualification of Norfolk Beier PLLC from continued representation of the Project Sponsor in this matter is warranted unless it can demonstrate full compliance with the requirements of Rule 1.11 and obtain a waiver from APA as required by Rule 1.11(b).

34. I affirm, this 20th day of January 2026, under the penalties of perjury under the laws of New York, which may include a fine or imprisonment, that the foregoing is true, and I understand that this document may be filed in an action or proceeding in a court of law.

PAUL VAN COTT, ESQ.

EXHIBIT A

WHITEMAN
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January 2, 2026

Via Email and Regular Mail

Matthew D. Norfolk, Esq.
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Re: Representation Conflict for APA Project # 2021-0276 (Hopmeier)

Dear Matt:

We represent the Adirondack Council, Inc. in relation to the above matter and have advised our client that it is our responsibility as its attorneys to bring an apparent conflict in your firm's continued representation of the applicant in this matter to your and the Adirondack Park Agency's ("APA") attention.

In reviewing the record, we have learned that Sarah Reynolds, who is now Senior Counsel to your firm (https://norfolkbeier.com/firm) worked directly on this matter in her former role as an APA attorney. Specifically, this work included drafting a detailed memorandum (copy attached) to APA's Regulatory Programs Committee in response to your client's appeal of an APA staff information request, as well as a presentation by Ms. Reynolds to the Committee at its May 2024 meeting. See https://vimeo.com/showcase/11632607?video=1065189837.

There is no question that Ms. Reynolds is prohibited from involvement in your firm's representation of the applicant in this matter, given her past work on the matter as an APA attorney. This follows from her disqualification pursuant to both Public Officer's Law § 73(8)(a) and Rule 1.11 of the New York Rules of Professional Conduct for attorneys. Rule 1.11 further imputes that prohibition to your firm unless it has taken required measures to:

> (1) Notify, as appropriate, lawyers and nonlawyer personnel within the firm that the personally disqualified lawyer is prohibited from participating in the representation of the current client;
> (2) Implement effective screening procedures to prevent the flow of information about the matter between the personally disqualified lawyer and the others in the firm;
> (3) Ensure that the disqualified lawyer is apportioned no part of the fee therefrom; and

(4) Give written notice to APA to enable it to ascertain compliance with the provisions of Rule 1.11.

There is a substantial real or perceived risk to the integrity of the hearing process from the continued representation of the applicant in this matter by your firm which "screening procedures" cannot fully or effectively[1] resolve. This stems from Ms. Reynolds's direct and in-depth participation in this matter as an APA attorney as reflected above. Also, in addition to her work on this matter, Ms. Reynolds served in a management-confidential position at APA and was very involved in the day-to-day interpretation and application of APA's laws and regulations in her role. Even if screening procedures are implemented by your firm, there is no way that the public can be certain of their effectiveness.

Since you represented the applicant in the same 2024 appeal to the APA Board that Ms. Reynolds worked on, you are obviously aware of her former involvement in this matter. We bring this issue to your firm's attention at the earliest opportunity and before your firm makes any formal submissions as part of the adjudicatory hearing record to provide you with an opportunity to resolve it. At this point, we are aware of the following options for your firm to avoid disqualification from its continued representation of the applicant in this matter:

- Withdrawing from your representation of the applicant; or
- Providing a written waiver from APA with respect to your firm's continued representation of the applicant based upon its determination that your firm has satisfactorily complied with the requirements of Rule 1.11(b).

Please let us know how you intend to resolve this issue by January 9, 2026, so that we can avoid potentially unnecessary motion practice or other actions to protect our client's interests. We reserve all of our client's rights to seek appropriate relief to ensure that the risks of this apparent conflict are properly and fully addressed.

Very truly yours,

Paul Van Cott

Attachment

Cc: Barbara Rice, Executive Director

[1] The Comment to Rule 1.11 recognizes the difficulty that a small firm may have in instituting and maintaining effective screening, requiring "special care and vigilance."

NEW YORK STATE | Adirondack Park Agency

KATHY HOCHUL
Governor

BARBARA RICE
Executive Director

MEMORANDUM

TO: Regulatory Programs Committee

FROM: Sarah Reynolds, Associate Counsel SR

DATE: May 8, 2024

RE: Unconventional Concepts, Inc./Hopmeier
Permit Application 2021-0276
Appeal of Agency staff's January 2024 request for information

Summary

Unconventional Concepts, Inc. (UCI) seeks a permit from the Adirondack Park Agency to allow for the establishment of a commercial use involving the installation of a firing range for the testing of artillery on Rural Use lands in the Town of Lewis, Essex County. On January 2, 2024, Agency staff forwarded a fifth request for information regarding the application. On February 29, 2024, the applicant submitted an appeal of this request.

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposal. The type of weapon proposed for testing, the charge proposed for use with the weapon, specifics on the target and any other equipment proposed for use on the site, the proposed firing and target locations, and the number of shots proposed per day, month, and year, have all remained uncertain or changed. Even more significantly, the decibel level for the impulse noise source – the noise level produced at the moment of firing and the basis for any noise analysis – has changed with every response to staff's requests for information. In addition, none of the applicant's submissions have been stamped with the seal of a New York State-licensed professional engineer, as required under State professional standards for projects involving engineering principles and data.

The first four Notices of Incomplete Permit Application (NIPAs), along with numerous follow-up letters and meetings with the applicant, reflect staff's efforts to confirm the specifics of the proposed project and the resulting analysis of potential impacts. The fifth NIPA constitutes a further attempt to determine the information necessary for a complete application, with questions addressing previously submitted information that has changed or has remained unclear or unanswered.

The applicant's February 29, 2024, appeal of the fifth NIPA includes new information that has not been previously provided to the Agency. Staff analysis of this new information indicates that the record now contains sufficient documentation to allow for review of the proposal in relation to Questions 3 and 5 of the fifth NIPA. However, Questions 1, 2, 4, 6, 7, 8, and 9 remain unanswered.

Given the continuing inconsistencies in the record and the potential for impacts from the proposal, staff request that the Agency members affirm the need for the information requested in Questions 1, 2, 4, 6, 7, 8, and 9 of the fifth NIPA.

Legal Background and Review Process

The proposal at issue involves a new commercial use on Rural Use lands, and requires an Agency permit under the Adirondack Park Agency Act (APA Act). Prior to approving this project, the Agency must find that the proposal:

- will be consistent with the land use and development plan;
- will be compatible with the character description and purposes, policies, and objectives of the Rural Use land use area;
- will be consistent with the overall intensity guidelines for the Rural Use land use area;
- will comply with the shoreline restrictions of § 806 of the Act; and
- will not have an undue adverse impact upon the natural, scenic, aesthetic, ecological, wildlife, historic, recreational or open space resources of the Park or upon the ability of the public to provide supporting facilities and services made necessary by the project, taking into account the commercial, industrial, residential, recreational or other benefits that might be derived from the project.

Staff analyze any proposal that requires an Agency permit to ensure that the application is "complete for the purpose of commencing review," as set forth in §809(2)(b) of the APA Act. To do this, staff request information from applicants as necessary to allow for Agency consideration of the findings listed above. For any project not approved pursuant to the Agency's Delegation Resolution, staff make a recommendation to the Agency board as to whether the proposal appears approvable under the required findings, based on staff's analysis of the application materials. The Board may choose to follow or not follow staff's recommendation.

When a complete permit application contains sufficient information to allow the Agency to make the required findings, the Agency may approve the project, with conditions as necessary. When a complete permit application contains disputed facts or insufficient documentation to support approval, the Agency may require an adjudicatory-style public hearing on the proposal. The Agency may only deny a proposal after holding an adjudicatory-style hearing.

Relevant Facts and Project Review History

Project Site

The project site is a 197±-acre parcel of land located on Hale Hill Lane in the Town of Lewis, Essex County, in an area classified Rural Use on the Adirondack Park Land Use and Development Plan Map. The site is identified as Tax Map Section 38.1 Block 1, Parcel 31, and is currently owned by Pulsifer Logging, LLC.

The eastern portion of the project site contains two mountains, Little Church Mountain and Big Church Mountain, which are approximately 1,500 to 1,600 feet in height. A 50±-acre parcel of State lands included in the Taylor Pond Wild Forest adjoins the northeastern portion of the project site; the remainder of the site borders large tracts of Rural Use lands. The closest residence to the site is located approximately 5,800 feet to the northeast, and is currently owned by James Pulsifer. Additional residences are located along Hale Hill Road to the north and east of the site, along State Route 9 to the east of the site, and along Pulsifer Road to the south of the site.

A pre-existing missile silo, currently used as a commercial use, is owned by Diversified Upstate Enterprises, LLC, and located just over a mile to the east of the site. In addition, a sawmill subject to Agency permits is located just under a mile to the north of the site, and the "Oak Hill" mine, also subject to Agency permits, is located approximately a mile and a half to the south. Additional State lands in the Taylor Pond Wild Forest are located to the east and west, and the Jay Mountain Wilderness Area is located approximately two miles to the north and west of the site.

The project site is accessed by an existing drive used for timber harvesting. The site is currently improved by a cabin. A trail traverses the northwestern portion of the site and connects to adjacent Rural Use parcels.

Jurisdictional Inquiry and Permit Application

On August 26, 2021, the Agency received a Jurisdictional Inquiry Form from Michael Hopmeier for the installation of a ballistic testing range on the project site. The Agency responded to this inquiry on September 22, 2021, advising that the proposal involved the establishment of a new commercial use, and that an Agency permit would be required.

On November 19, 2021, the Agency received a permit application from Michael Hopmeier as Project Sponsor and James Pulsifer as representative for landowner Pulsifer Logging, LLC, for the establishment of a new commercial use. Specifically, the application proposed leasing a portion of the project site for the establishment of a "firing range" to:

> be developed and used to assess the internal ballistics of various kinetic systems used by the United States. The focus is to determine the effectiveness of various manufacturing approaches and techniques used in the manufacture of cannon barrels. The goal of the overall project is to decrease the weight of these systems to ensure the most efficient means of manufacturing and recuring cost of ownership, thereby reducing waste and cost, as well as improving performance... In effect, we are building a shooting range and will fire non-toxic, inert, steel projectiles over a distance of approximately 300 yards [or 900 feet].

The testing of artillery would occur in coordination with work occurring at the missile silo facility located to the east of the project site.

The application stated that "no more than three tests per month are anticipated," with operations occurring in "all seasons" and each test consisting of 1-3 shots over 1-2 days between 10am and 4pm on weekdays, and "an average of no more than 30 shots per year." Impulse noise from each shot was "not expected to exceed 180dB." The application also explained that "a small grouping of mountains" on the site would "act as a projectile backstop... thereby allowing for the reflection/deflection of noise away from more populated areas and into a large open space that can absorb and dampen any impact."

The application stated that approximately 100 tons of gravel from the Oak Hill mine would be used to construct an approximately 100-foot by 100-foot firing platform structure; other site work would include "clearing brush and a limited number of trees," using "herbicides to control unrestricted undergrowth," and using the existing access road to bring in materials for each test, including "a mobile power supply such as a generator on a trailer, portable instrumentation carriers, a trailer, a porta potty, and other mobile support equipment." The application noted that "a portable steel cargo container... filled with sand or other aggregate" might be brought on the site as "a projectile-catcher," but was "not expected to be necessary." The application did not offer any further specifics on the type of equipment or weapons that would be used on the project site.

Maps included with the application showed the location of the existing cabin on the property and the general location of the proposed firing pad and range.

First Notice of Incomplete Permit Application and Response

On December 6, 2021, Agency staff issued a first NIPA for the project. This first NIPA included requests for:

- A site map depicting the lease subdivision lines to allow for confirmation of potential subdivision jurisdiction, and documentation of the location of the other proposed activities;

- A noise impact evaluation using the NYS DEC Program Policy for Assessing and Mitigating Noise Impact (DEC Noise Policy)[1];
- Confirmation as to whether any contaminants would be used on site;
- Confirmation as to whether improvements to the existing access road would be required;
- Additional plans, including a plan for removal of spent projectiles, a design guide, a stormwater management plan, an unexploded ordnance plan, and a decommissioning plan;
- An alternatives analysis; and
- Information regarding coordination with other federal, state, and local agencies.

On December 15, 2021, Agency staff attended a site visit with the applicant. On December 22, 2021, the Agency received from the applicant a response to the first NIPA. This response included an un-scaled aerial photograph overlaid with approximations of the proposed lease and firing range areas. In response to staff's questions regarding contaminants and the removal of spent projectiles, the response stated that the "projectiles used during testing will normally consist of solid bullets of steel" and that, "in the event a target is used... the current design envisions a contained quantity of sand or soil (approximately 8 X 8 X 40 ft) into which projectiles will be fired," but noted that "this design may be modified based on actual operation and empirical data." The response also stated that, "if operations do not require a target, then direct impact into the ground... and projectile recovery will be utilized."

The December 22, 2021, response included a written noise evaluation and overlays of aerial photographs using "a complex non-linear topographic multi-variate inverse square law model for noise distribution that considered propagation over a distance, insertion of a barrier, ground effect, and air absorption" to examine impacts at two receptors: the missile silo located just over a mile to the east of the site, and the Pulsifer residence located just over a mile to the northeast. The evaluation stated that the noise level at the location of firing was "not expected to exceed 185 dB." A noise source of 183 dB was used in the calculations, based on which the applicant stated that "we can anticipate a reduction at both sites to approximately 82 dB centered on 125 Hz peak energy frequency, or a reduction of 101 dB." The evaluation then listed the noise levels of shotguns, rifles, Magnums, chainsaws, and thunder from nearby lightning strikes. For mitigation, the December 22, 2021, response proposed following the blasting notification procedures used by the nearby Oak Hill mine, which would be "part of the [firing range's] site security and operations plan." The noise evaluation was not signed by an engineer or any other New York State licensed professional.

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[1] When reviewing projects, Agency staff regularly require completion of a noise impact evaluation for the proposed activity following the review standards established by the DEC in its Program Policy for Assessing and Mitigating Noise Impact. The DEC Noise Policy is available on the DEC website at Assessing and Mitigating Noise Impacts (ny.gov).

The December 22, 2021, response asserted that no stormwater management plan, unexploded ordnance plan, or decommissioning plan was necessary, and declined to confirm whether the proposal involved any upgrades to the existing access road. The applicant also declined to provide a design guide, stating that, "We will be working closely with the US Army Development Command... they will provide guidance and approval for the range design and operating procedures... All operations will be in accordance with either approved and designated Army protocols, or based on best engineering and technical judgment developed in coordination with relevant Army staff and personnel." In relation to potential alternatives, the response stated that "other sites... were considered," but were not chosen because of the existing natural features of the project site. The response declined to propose any on-site alternatives, such as a berm or other sound barrier as suggested by the DEC Noise Policy.

Second Notice of Incomplete Permit Application and Response

On January 13, 2022, Agency staff issued a second NIPA for the project. This second NIPA included requests for:

- A site map and documentation of the location of the proposed activities, including the lease subdivision lines and other details;
- A revised noise impact evaluation using 185 dB as the maximum anticipated impulse noise level as referenced in the applicant's December 22, 2021, response and analyzing potential noise impacts to additional receptors within a two-mile radius;[2]
- A noise mitigation plan, as well as the "site security and safety operations plan" referenced as providing for noise mitigation in the applicant's December 22, 2021, response;
- Information regarding the existing trail that traverses the project site and connects to adjacent private lands;
- An additional analysis of alternatives to the proposal; and
- Additional coordination between the Agency and other state and federal entities.

On February 11, 2022, the Agency received from the applicant a partial response to the second NIPA. This partial response stated that, according to the landowner, there are no outside parties with the right to access the road/trail that traverses the project site. In relation to staff's request for an additional analysis of alternatives, the partial response stated that "it would be impractical to move the testing to a location farther from" the missile silo to the east of the site and that "any attempt to relocate the testing to a significantly more distant area would be cost prohibitive." Finally, in relation to staff's request for an updated noise impact evaluation, this partial response "revised the numbers in the model to accurately reflect the impulse noise value of 185 dBa."[3] The

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[2] Pursuant to the DEC Noise Policy, noise evaluations require determining and calculating potential impacts from "the maximum amount of sound created at a single point."

results of this updated assessment were shown on a "Noise Map" depicting noise levels overlaid on an aerial photograph of the area.

At the applicant's request, on February 25, 2022, Agency staff attended a meeting with the applicant to discuss the second NIPA and the materials received on February 11, 2022. Following this meeting and a follow-up letter from staff to the applicant on March 1, 2022, confirming that portions of the second NIPA were considered "either satisfied or no longer required," on May 12, 2022, the Agency received from the applicant an additional response to the second NIPA. In relation to staff's request for a scaled site plan, this additional response included two scaled plans showing a portion of the project site. No lease subdivision lines were shown on these plans. In addition, no dimensions or distances were shown, and not all markings were labeled. According to the scale on the plans, the firing pad measured approximately 30 feet by 80 feet, and the distance between the pad and the target measured approximately 571 feet.

The additional response received on May 12, 2022, stated that, "based on recommendation from the APA, further research on the noise source was performed," with the noise source now "assumed to be 166.1 dB." Specifically, in two locations, the May 12, 2022, response described the "Noise Source" as a "M109A5/6; Paladin, 155mm self-propelled Howitzer firing M4A2 zone 7 charges," with a "Noise Level" of 166.1 dB. The reference materials cited for this noise level showed that the 166.1 dB measurement was taken from "in fighting compartment with hatches open except drivers," rather than from open air firings.

The additional response received on May 12, 2022, also stated that the proposal had been updated to use a soft catch system for projectiles, rather than using direct impact into the mountains as the target as previously proposed. Using an "ambient noise level... assumed to be approximately 80 dB at the [Pulsifer] residence," the additional response then included a series of calculations performed by the applicant and concluded that "there is a negligible difference in noise level [at the Pulsifer residence] across an 8-hr day between a day when two shots are fired and [a] day when no shots are fired." No calculations were provided for any other potential noise receptors, and the noise evaluation was not signed by an engineer or any other New York State licensed professional.

In relation to the Agency's request for a noise mitigation plan, the additional response received on May 12, 2022, described "active noise mitigation measures," such as

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[3] This is the first incidence in the record of a reference to dBa (also referred to as dBA or dB(A)). According to the DEC Noise Policy, "perceived loudness is expressed in decibels (dB) or A-weighted decibel scale dB(A) which is weighted towards those portions of the frequency spectrum, between 20 and 20,000 Hertz, to which the human ear is most sensitive." In general, the same impulse noise source level would be expressed as a higher number when measured in decibels (dB) than in A-weighted decibels (dB(A)). The applicant's submissions vary between references to dB and dB(A) in relation to the impulse noise level and noise impact evaluation. Question 9 of the fifth NIPA requests an updated noise impact evaluation documenting both dB and dB(A) measurements for all relevant sound pressure levels.

limiting the number of shots fired annually, limiting the hours of operation, and providing "early warning of the event" pursuant to the procedures used by the nearby Oak Hill Mine as well as "audible warnings (siren) that can be discerned at" the Pulsifer residence, and concluded that the proposal was "not expected to cause any hearing damage or increases in anxiety or stress in nearby residents." The additional response also described "passive noise mitigation measures," such as the distance from the Pulsifer residence to the proposed testing range, the natural vegetation and local topography, and the fact that, because of "the rock structure of the mountains," noise coming from the proposed range "will be reflected back to the west," toward State lands and "away from the residences and populations in the surrounding areas." The response proposed no new noise mitigation measures.

Third Notice of Incomplete Permit Application and Response

On June 6, 2022, Agency staff issued a third NIPA for the project. This third NIPA included requests for:

- An updated site map with all markings labeled that depicted and confirmed the size of the lease area, which remained unknown, and the dimensions and locations of the firing pad and target area, which appeared to have changed from the initial application;
- An updated noise impact evaluation comporting with the DEC Noise Policy, prepared by a NYS licensed professional, and including an explanation of the decrease in proposed maximum noise levels from 185 dB to 166.1 dB;
- An explanation of the assumed ambient noise level of 80 dB at the site and the Pulsifer residence;
- Clarification of the procedures for public notification of tests;
- Inclusion of additional noise mitigation measures;
- Confirmation of the equipment and machinery proposed for use on site; and
- Clarification of numerous other discrepancies between submissions.

The third NIPA noted that "the proposal as presented consists of testing munitions year-round up to 120 times per year with an estimated munitions firing noise source of 185 dB with no noise source mitigation measures proposed," while the U.S. Department of the Army considers any impulse noise greater than 140 dB to be hazardous, and the US Bureau of Mining has documented damage to residential dwelling window glass from over air pressure blasts of greater than 133 dB.

On September 16, 2022, and November 9, 2022, the Agency received from H2H Associates, LLC (now H2H Geoscience Engineering, PLLC; referred to herein as H2H) an initial and revised Scope of Work proposal for performing a noise analysis at the project site. Staff responded to these letters on September 28, 2022, and November 28, 2022. The specific changes to the Scope of Work requested in staff's responses were later incorporated by H2H, though no final approval of the proposed Scope of Work was ever issued by staff.

On February 28, 2023, the Agency received a partial response to the third NIPA from Matthew Norfolk, Esq., as attorney for UCI, which was now described as the applicant. This response stated that the applicant was no longer proposing a lease subdivision, and would instead "have access to the area at certain times to perform ballistic testing in coordination with" the landowner.

In response to staff's request for clarification of the dimensions and locations of the firing pad and target area, the February 28, 2023, response stated that: "The specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time."

In response to staff's request for confirmation as to the equipment and machinery proposed for use on site, the February 28, 2023, response declined to name any specifics, instead stating only that "all vehicles and equipment used on site will not exceed current noise levels created by" vehicles commonly used in sawmill operations. In response to staff's request for clarification of the procedures for public notification of tests, the response stated that, seven days prior to any test, UCI would notify the Town and mail notice to landowners "within a two-mile radius."

On March 1, 2023, the Agency received a document titled "Sound Study Unconventional Concepts, Inc. APA Project #2021-0276," prepared by H2H, and dated February 2023 (February 2023 Sound Study). The Project Background section introducing the February 2023 Sound Study included an explanation of the proposed testing process: "Each test will consist of four-five shots, and each series of shots will last no more than two days. Testing will only occur on weekdays, between 10:00 AM and 4:00 PM local time. No more than two shots will be fired in one day... The Sound Source (system being tested) will be located on a 100 ft. X 100 ft. crushed gravel pad (Firing Pad)... The Target Area is 590 ft. east of the Firing Pad."

The February 2023 Sound Study updated the specific weapon proposed for firing at the project site: an M109A3GN (155 mm) Howitzer. The February 2023 Sound Study also clarified for the first time some of the additional equipment proposed for use: a 40-ton haul truck for transporting the howitzer and other materials to and from and across the site.

The February 2023 Sound Study named 176 dB(A) as the noise level for the howitzer, stating that this "sound level data for the Sound Source is provided in" an older study, titled "Noise emission data for M109, 155 mm field howitzer," prepared by Morten Huseby for the Norwegian Defence Research Establishment, and dated December 5, 2007 (the 2007 Norwegian Study). The 2007 Norwegian Study, which was included with the materials received on March 1, 2023, examined the firing of M109, 155 mm field howitzers with a charge of up to 5 modules DM72, with each module containing 2.44 kilograms propelling charge.

The 2007 Norwegian Study was "conducted at the Norwegian Defence Research Establishment... to estimate noise pollution around military firing ranges." The study stated that the "M109 [Howitzer] is one of the noisiest weapons in the Norwegian defence, and as such represents a limiting factor for activity at firing ranges and training fields." The Study also repeatedly stated that, to the author's knowledge, there existed no "consensus" or "commonly accepted methods" for producing free field emission data to use for analyzing potential sound impact levels from howitzers.

Using 176 dB(A) as the noise source, the February 2023 Sound Study modeled impulse sound levels at five receptors within two miles of the project site: Receptors M-1, M-2, and M-3 located along residential lands to the east and south of the site, and Receptors M-4 and M-5 located on State lands to the west and northeast of the site. The modeled impulse sound levels were calculated as 75, 71, and 73 dB(A) at Receptors M-1, M-2, and M-3; 79 dB(A) at Receptor M-4; and 107 dB(A) at Receptor M-5.

As part of the February 2023 Sound Study, H2H also recorded and modeled ambient noise levels at the receptor sites, and then charted the difference between the ambient sound levels and the modeled impulse sound levels. The study modeled the impulse noise as being between 17.8 dB(A) and 72.3 dB(A) higher than the ambient noise levels.

Finally, the February 2023 Sound Study analyzed the overall change in ambient sound levels that would occur during the six-hour period from 10am to 4pm on a day with two shots fired. This modeling found that, because the impulse noises were so short, the increase in overall ambient noise levels over the six-hour period ranged from 0 to 0.4 dB(A) at Receptors M-1 through M-3, and from 2.0 to 32.0 at Receptors M-4 and M-5. The Study then found that "the proposed project does not pose a potentially significant environmental impact due to an increase in sound levels at receptors in the area."

The February 2023 Sound Study included an overlay of an aerial photograph, labeled Figure 1 – Site Overview Map. Figure 1 is scaled at 1 inch : 1,000 feet, and shows the region of the project site and approximate locations of the firing pad, howitzer, target, and property lines.

The February 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

Fourth Notice of Incomplete Permit Application and Response

On March 16, 2023, Agency staff issued a fourth NIPA for the project. This fourth NIPA included requests for:

- A revised noise impact evaluation that complies with the DEC Noise Policy, clarifies and documents the method for determining 176 dB(A) as the accurate noise source level for the howitzer, clarifies and documents the modeling used

for sound levels at the receptor sites, and clarifies numerous facts and other discrepancies among the prior submissions, including between the number of shots proposed for each test and the proposed charge for each test; and

- Confirmation of the equipment proposed for use at the site, noting that an "armored tracked vehicle" was documented as transporting the howitzer in the 2007 Norwegian Study.

The fourth NIPA also stated that, "until an acceptable full noise assessment has been provided, the Agency cannot assess whether the currently proposed public notification and mitigation is adequate."

At the applicant's request, on June 26, 2023, Agency staff attended a meeting with the applicant to discuss the fourth NIPA. On August 1, 2023, the Agency received from UCI a partial response to the fourth NIPA. In response to staff's questions regarding the noise source level for the proposed howitzer and the modeling used for sound levels at the receptor sites, the UCI response noted that the applicant had been required "to develop data that could be used to model the attenuation of sound produced by a howitzer due to the previous lack of available information."

In response to staff's request for confirmation of the equipment proposed for use at the site, the August 1, 2023, UCI response reiterated the applicant's earlier assertion that only "a diesel truck similar to what has historically operated on site in support of logging activities will be used to transport the" howitzer around the site. In response to staff's request for clarification of the number of shots proposed for each test, the response stated that no more than two shots are proposed for any given day, with up to three days of shots associated with each test. Finally, in response to staff's question regarding the maximum proposed charge, the response asserted that "the level of sound for all charge sizes employed will not exceed those acceptable levels determined by H2H's assessments and testing." The response concluded that "there are no other practicable means to mitigate noise."

The August 1, 2023, UCI response stated that "the Source sound power level was transcribed incorrectly in the H2H February 2023 Sound Study Report. Source sound power level is 180.8 dB (163.2 dB(A)), not 175.9 dB."

An updated Sound Study, prepared by H2H, dated July 2023, and included with the partial response (the July 2023 Sound Study), explained that the 180.8 dB sound power level was determined by using a Table in the 2007 Norwegian Study that documented a sound pressure level of 130.5 dB at a sensor located 803 feet away and at a 32-degree angle from a howitzer. There is no indication of variables such as terrain, vegetation, or wind and temperature conditions at the time of firing in the 2007 Norwegian Study. Nevertheless, using "industry standard calculations," the applicant used its own model to calculate back to determine the originating sound pressure level for the howitzer in the Norwegian study, and then determined that the sound level would be 127 dB at this same distance and angle from a howitzer on the project site. The July 2023 Sound

Study then asserted that the difference of 3.5 dB between the 130.5 dB recorded sound pressure reading in the Norwegian study and the applicant's modeled sound pressure reading of 127 dB showed "correlation within ISO standards." Therefore, according to the applicant, a level of 180.8 dB at the location of the howitzer should be considered accurate.

The July 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

On August 16, 2023, Agency staff issued a letter confirming receipt of the August 1, 2023, response, and noting that the Sound Study had not been sufficiently updated as requested and that the response had not confirmed the maximum charge proposed. The letter noted that, using the applicant's modeled potential error discrepancy of 3.5 dB, the application documented a potential for impulse noise levels at nearby State lands above the 133-dB level determined capable of breaking windows as documented by the US Bureau of Mining.

On December 15, 2023, the Agency received from UCI an additional response to the fourth NIPA. For the first time in the application process, this additional response proposed a noise mitigation measure that did not rely on the natural features of the site or notification to nearby landowners: the applicant now proposed to install a "Sound Mitigation Berm" on the site. The response stated that the berm would be 13 feet in height and "constructed along the northern boundary of the Firing Pad," but gave no specifics on the materials that would be used for construction or the location of the berm in relation to the howitzer. The December 15, 2023, UCI response also included modeling of sound levels by temperature and humidity, noting that "testing is not anticipated to take place" at lower temperatures, as well as additional sound power level and sound pressure level calculations, charts, and conclusions.

An updated Sound Study, prepared by H2H and dated September 2023 (the September 2023 Sound Study), was included with the materials received on December 15, 2023. The September 2023 Sound Study modeled impulse sound levels at Receptors M-1 through M-5 with and without the berm, although the study did not contain the modeling of sound levels by temperature and humidity or the additional sound power level and sound pressure level calculations, charts, and conclusions submitted with the UCI response.

The September 2023 Sound Study included a new color-coded model of sound pressure levels. This model is labeled "Image 1," and is described by the September 2023 Sound Study as "demonstrat[ing] the accuracy of the sound propagation model." "Image 1" appears to be an overlay of an aerial photograph of the site, although the locations of the firing pad, howitzer, target, and property lines are not visible. The September 2023 Sound Study also included the aerial photograph overlay labeled Figure 1 – Site Overview Map that had been included with the prior sound studies; this map shows the region of the project site with the locations of the firing pad, howitzer,

target, and property lines approximated, but without the color-coded sound pressure level modeling distinct to "Image 1."

The September 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

On January 2, 2024, Agency staff issued a fifth NIPA for the project. On January 18, 2024, the Agency received a request for an extension to the deadline for filing an appeal of the fifth NIPA pursuant to 9 NYCRR § 572.22(c). On January 18, 2024, staff responded by letter agreeing to the extension. On February 29, 2024, the Agency received the applicant's appeal of the fifth NIPA.

Appeal

Pages 1-12 of the appeal contain a summary by the applicant of the history of project submissions and Agency staff responses regarding the proposed firing range. Staff disagree with a number of the factual and other statements made in this summary. The applicant's summary, along with all other submissions and staff correspondence, are part of the record for this appeal.

The matter presented for review and action by the Agency members at this time is a challenge to the questions included by staff in the fifth NIPA. However, staff analysis of new information included in the appeal indicates that the application now contains sufficient information to allow for analysis of the proposal in relation to Questions 3 and 5. Accordingly, the remaining challenges to the fifth NIPA involve Questions 1, 2, 4, 6, 7, 8, and 9.

Responses Considered Sufficient

- Question 3 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the impulse noise level and location of proposed noise source. The maximum impulse noise level was stated as 180 dB in the initial application on November 21, 2021, 185 dB in the response to the first NIPA, 185 dB and then 166.1 dB in response to the second NIPA, 176 dB(A) in response to the third NIPA, and 180.8 dB (163.2 dB(A)) in response to the fourth NIPA. The proposed size and location of the firing pad has also been inconsistent throughout the applicant's submissions. Staff have continually noted that, due to the potential for impacts based on the impulse noise level and location of proposed noise source, additional noise mitigation measures may be required.

Until December 15, 2023, the applicant's responses to these comments regarding mitigation centered on the mitigation measures described in the initial application: that notification to nearby landowners of upcoming tests would not cause hearing damage or

increase anxiety or stress in nearby residents, and that the natural features of the site would reflect noise away from residences and towards uninhabited State lands to the west. On December 15, 2023, in a response to the fourth NIPA, the applicant proposed installing a berm as a new mitigation measure.

Question 3 of the fifth NIPA recommended additional potential mitigation measures, and requested an evaluation of whether any could be added to further limit noise impacts from the proposal. The applicant responded to this question on page 15 of the appeal, explaining that these additional measures would be unacceptable.

For the purpose of commencing review, staff have no additional questions regarding this issue. The applicant's response, along with staff's technical review and analysis, will be included as part of the permit application for future Agency review.

- Question 5 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposed timing and number of shots. Specifically, the initial application stated that there would be an average of 30 total shots per year under the proposal, but according to later submissions, there would be up to 10 shots per month, year-round. In addition, the applicant's December 15, 2023, written response suggested that no testing would occur at times of the year with lower temperatures, despite earlier indications that testing would occur in all months.

Question 5 of the fifth NIPA requested confirmation of the proposed maximum number of shots per week, month, and year, and whether there were any atmospheric conditions under which testing would not occur. The applicant responded to this question on pages 16-17 of the appeal, confirming that testing is proposed to occur year-round, with a maximum of 10 shots per month, and with no atmospheric restrictions.

For the purpose of commencing review, staff have no additional questions regarding this issue. The applicant's response, along with staff's technical review and analysis, will be included as part of the permit application for future Agency review.

Questions Remaining

- Question 1 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposed location of the noise source and the distance between the noise source and the private and State land receptor sites used in the noise analysis. As noted in the first paragraph of Question 1 of the fifth NIPA, in a submission received on February 28,

2023, the applicant stated that the location and distance would vary from test to test: "The specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time." Noise impact evaluations depend on calculations using precise locations and distances; accordingly, the exact locations and distances must either be confirmed and used in the noise analysis, or the analysis must account for the worst-case-scenario for these factors.

> Staff request: *"Please provide cross-section sheet(s) depicting the proposed typical M109 155 mm howitzer and assembly set up to be utilized on site, including all proposed instrumentation and test articles, that is drawn to scale and depicts howitzer barrel and assembly dimensions and muzzle location. Please label the location of the noise source and its associated sound pressure level source height as measured from the finished grade of the pad."*

This request attempts to document the size of the proposed howitzer in face view. In particular, the requested sheet(s) would document the distance of the muzzle – which was the noise source location used in the 2007 Norwegian Study – from the rest of the artillery, and the height of the muzzle from the ground or firing pad.

> Staff request: *"To allow for review of worst-case scenario noise impacts, please provide scaled cross-section plan sheet(s) depicting the distance between the closest point of the proposed gravel pad or the noise source, whichever is closer, to each of M1-M5, and between the closest point of the proposed gravel pad and the receptor located at the southwest corner of the nearest state land parcel. Please depict the proposed berm on each of these plan sheets."*

This request attempts to document the location of the proposed howitzer in plan view. In particular, the requested sheet(s) would document and confirm the distance of the noise source from the receptor sites used in the noise impact evaluation. In addition, as the only indication in the record of the location for the proposed berm is that it would be "constructed along the northern boundary of the Firing Pad," this request also requires a scaled depiction of the berm in plan view.

The appeal states that "previous submissions" show that the "howitzer barrel assembly" will be "located in the center of the 100-foot by 100-foot firing pad;" however, a search of the record by staff finds no evidence that this information has been previously submitted. The appeal also supplies calculations not previously in the record purporting to model sound pressure levels at Receptors M-1 through M-5 with the sound source at "the edge of the firing pad;" however, these calculations were not provided and stamped by a NYS-licensed engineer and, in any event, do not account for the possibility of the noise source extending beyond the edge of the pad toward the receptor sites. Finally, the appeal points to the fact that the H2H Sound Studies use "a Sound Source height of

6.5 feet;" however, there remains no documentation in the record that 6.5 feet is or will be the accurate height of the noise source from the ground or firing pad.

As noise impact evaluations depend on calculations using precise locations and distances, the exact locations and distances must either be confirmed and used in the noise analysis, or the analysis must account for the worst-case-scenario for these factors. Therefore, given the importance of documenting and confirming the exact location of the proposed noise source in relation to the receptor sites, staff request that the Agency members affirm the need for the plan sheets requested in Question 1 of the fifth NIPA.

- Question 2 of the fifth NIPA

  Staff request: *"Please clarify what materials the berm will be constructed with, and any associated stabilization measures and other erosion and sediment controls."*

Despite numerous requests and suggestions for potential noise mitigation measures, no on-site mitigation was proposed until December 15, 2023, in the additional response to the fourth NIPA, when the applicant proposed installation of a berm "along the northern boundary of the Firing Pad." The record contains no specifics on the materials that would be used for construction, the location of the berm in relation to the noise source, or even whether the berm would be permanent or temporary and subject to movement or re-construction for individual tests.

As noted in the DEC Noise Policy, installation of a berm can be helpful in reducing potential noise impacts. However, any reduction in noise would depend on the type, size, and location of the berm in relation to the noise source; these factors must be known to allow for calculations of the angle of reflection and barrier attenuation. In addition, stabilization measures and erosion and sediment controls are sometimes necessary to protect nearby resources from berms, depending on the materials and method used for construction.

Given the importance of documenting the details related to the proposed berm, staff request that the Agency members affirm the need for the information requested in Question 2 of the fifth NIPA.

- Question 4 of the fifth NIPA

  Staff request: *"Please explain why there are separate tables, calculations and conclusions made in the UCI written response received on December 7, 2023, that are not included in the [September 2023 Sound Study by H2H]."*

UCI's December 15, 2023, additional response to the fourth NIPA included modeling of sound levels by temperature and humidity and other sound power level and sound

pressure level calculations, charts, and conclusions that are not included or reflected in the September 2023 Sound Study completed by H2H. Question 4 of the fifth NIPA attempts to reconcile these differences, to ensure that the record for Agency review and decision reflects consensus on the final proposal and modeled impacts.

Given the importance of documenting the details related to potential noise impacts, staff request that the Agency members affirm the need for the information requested in Question 4 of the fifth NIPA.

- Question 6 of the fifth NIPA

  Staff request: *"Please revise Image 1 to depict the location of the 100-foot by 100-foot pad, all state land boundaries, the southwest corner of the nearest state land parcel located approximately 300 feet from the northeast corner of the firing pad, the nearest dwellings (including the Pulsifer residence), receptor locations M1 – M4, and the closest point of the proposed gravel pad or the noise source, whichever is closer, to each receptor."*

H2H's September 2023 Sound Study modeled impulse sound levels at Receptors M-1 through M-5 with and without the berm. The study then asserted that "the accuracy of th[is] sound propagation model" was demonstrated in "Image 1."

"Image 1" is a color-coded model of sound pressure levels that was first submitted to the Agency with the September 2023 Sound Study, received on December 15, 2023. "Image 1" appears to be an overlay of an aerial photograph of the site; the locations of the firing pad, howitzer, target, and property lines are illegibly hidden beneath the color-coding of sound pressure levels.

In the appeal, the applicant states that Question 6 has been "asked and answered," because "UCI has already supplied Agency Staff with the requested information in Figure 1, 'Site Overview Map,' provided in H2H's September 2023 Sound Study." However, while Figure 1 in the September 2023 Sound Study does approximate the locations of the firing pad, howitzer, target, and property lines on an aerial photograph, Figure 1 does not contain the color-coded sound pressure level modeling distinct to "Image 1."

Given the importance of documenting the accuracy of the sound propagation model used in the sound studies in the record and the applicant's insistence that "Image 1" provides this documentation, staff request that the Agency members affirm the need for the revision to "Image 1" requested in Question 6 of the fifth NIPA.

- Question 7 of the fifth NIPA

In response to the request in the fourth NIPA for information as to how the decibel level of the noise source was determined by the applicant, the July 2023 Sound Study and

the September 2023 Sound Study both state that the level was calculated using a Table in the 2007 Norwegian Study. Specifically, the sound studies explain that this table showed a documented sound pressure level of 130.5 dB at a sensor located 803 feet away and at a 32-degree angle from a howitzer. There is no indication of variables such as terrain, vegetation, or wind and temperature conditions at the time of firing in the 2007 Norwegian Study. Nevertheless, using "industry standard calculations," the applicant used its own model to calculate back to determine the originating sound pressure level for the howitzer in the Norwegian study, and then determined that the sound level would be 127 dB at this same distance and angle from a howitzer on the project site. The July 2023 Sound Study then asserted that the difference of 3.5 dB between the 130.5 dB recorded sound pressure reading in the Norwegian study and the applicant's modeled sound pressure reading of 127 dB showed "correlation within ISO standards." Therefore, according to the applicant's response to the fourth NIPA, a sound power level of 180.8 dB at the location of the howitzer should be considered accurate.

> Staff request: *"Please provide an explanation of these ISO standards and the asserted correlation, including a clarification of whether the ISO standards are appropriately used in this context. Please also provide any other available documentation confirming that 3.5 dB is appropriately cited as the maximum limit of error for this proposal.*
>
> *Please confirm through field-verification at an authorized location and through independent third party verifications that 180.8 dB is the noise level produced by M109 155 mm howitzers."*

The DEC Noise Policy requires determining the maximum amount of sound created at a noise source, and then conducting a noise impact evaluation based on this level. Accordingly, it is imperative that the noise level of a noise source is accurately determined, to allow for analysis of potential impacts at receptor locations.

Question 7 of the fifth NIPA requests confirmation of the accuracy of the applicant's assertion of 180.8 dB as the noise level of an M109 155 mm howitzer. Staff remain concerned about the accuracy of this number for several reasons: every prior submission posited a different decibel level for the noise source; the 180.8 dB figure was calculated based a single measurement from one study in 2007 conducted in unknown conditions and with other unknown variables; the only confirmation of the accuracy of the applicant's calculation is based on their finding of a noise level 3.5 decibels lower than was documented in the 2007 Norwegian Study when the distance and angle of the 2007 measurement were inputted in the applicant's model; and the applicant asserts that a discrepancy of 3.5 decibels "show[s] correlation with ISO standards," where ISO standards have not been used in relation to other recent commercial and mining projects within the Park.

Given the importance of documenting the accuracy of the noise level of the noise source used in the sound studies in the record, staff request that the Agency members affirm the need for the information requested in Question 6 of the fifth NIPA.

- Question 8 of the fifth NIPA

  Staff request: *"The 'Noise emission data for M109, 155 mm field howitzer' study referenced in the [December 2023 Sound Study] references a maximum charge of 5 modules DM72 with each module containing 2.44 kilograms propelling charge, while USACHPPM materials referenced in the UCI response received by the Agency [on] July 18, 2022 reference the sound level for a M4A2 zone 7 charge. Please confirm that this will be the maximum charge used. Please also explain how the two charges compare and the effect [the charge] will have on the level of sound produced."*

UCI's May 12, 2022, submission to the Agency in response to the second NIPA described the noise source for the project as M4A2 zone 7 charges. However, the 2007 Norwegian Study, which was submitted on March 1, 2023, in response to the third NIPA and was used to model the decibel level of the proposed noise source for the H2H Sound Studies, involved a charge of up to 5 modules DM72, with each module containing 2.44 kilograms propelling charge.

The charge used in a howitzer may significantly alter the impulse noise level produced from firing. Accordingly, Question 8 of the fifth NIPA was first asked in the fourth NIPA, in response to the differing charges proposed after the second and third NIPAs. UCI's response to the fourth NIPA stated only that "the level of sound for all charge sizes employed will not exceed those acceptable levels determined by H2H's assessments and testing."

Given the importance of confirming that the maximum charge proposed will not result in impulse noise levels above the levels used in the sound studies in the record, staff request that the Agency members affirm the need for the information requested in Question 8 of the fifth NIPA.

- Question 9 of the fifth NIPA

  Staff request: *"Please provide an updated noise analysis that accounts for the confirmed height of the noise source from the gravel pad and the location of the noise source at the closest point of the gravel pad to each receptor. This updated noise analysis must include all tabular, calculated, and conclusory information included in the latest UCI response, Modal Data in Appendix D, and barrier attenuation calculations that account for the most conservative/worst case scenario height and location of the noise source in relation to each receptor. The updated noise analysis must also account for all proposed months of operation and any proposed atmospheric operating restrictions. In addition, the analysis*

must include revised tabular information, Modal Data in Appendix D, and barrier attenuation calculations that account for the height and location of the noise source in relation to each receptor, and must include sound pressure levels expressed as both dB and dBA. This updated analysis must include a cover sheet with the seal of a NYS licensed professional engineer."

Given the continuing inconsistencies in the record and the potential for impacts to Park resources from the proposal, staff request that the Agency members affirm the need for the updated noise impact evaluation requested in Question 9 of the fifth NIPA. In addition, as New York State professional standards require that projects involving the application of engineering principles and data be signed and stamped with the seal of a New York State licensed professional engineer, staff also request that the Agency members affirm the need for the updated noise impact evaluation to include a cover sheet with the appropriate seal.

Conclusion

For the reasons stated above, staff request that the Agency members affirm the need for responses to Questions 1, 2, 4, 6, 7, 8, and 9 of the NIPA.

EXHIBIT B

Adirondack Daily Enterprise

Norfolk Beier announces new senior counsel

Sarah Reynolds (Provided photo)

LAKE PLACID — Norfolk Beier PLLC has announced that Sarah Reynolds has joined the firm as senior counsel.

Reynolds' practice focuses on representing individuals and businesses in matters related to permitting, litigation, dispute resolution, and other aspects of real property, land use and zoning.

Before joining Norfolk Beier PLLC, Reynolds spent nearly 20 years as an attorney with New York state's Adirondack Park Agency, where she managed the interpretation and administration of the park's environmental and land-use laws. Reynolds was responsible for guiding applicants, employees and board members through the review process for the most complex subdivision and development proposals presented to the Agency. When these matters resulted in litigation, Reynolds worked closely with the Office of the Attorney General to develop strategies, draft documents and prepare for court.

During her time at the Agency, Reynolds also wrote and edited countless permits and variances, settlement agreements, policies, press statements, contracts, publications, and legislative and regulatory proposals. She

regularly presented at public meetings and planning conferences on complex land use topics, advised municipalities on interpreting their zoning codes, and collaborated with stakeholders to resolve differences and implement solutions on various issues.

To improve consistency, efficiency and fairness in the agency's review process, Reynolds revised and streamlined numerous documents, including the templates for jurisdictional inquiry responses, subdivision and development permits, area variances, and settlement agreements. Additionally, she developed a program to interpret and explain the agency's laws through internal guidance for employees, informational flyers and public presentations tailored for landowners, local government officials, businesses and contractors.

Reynolds has long been a leading expert on the complicated system of zoning and land use laws that apply within the Adirondack Park. She enjoys challenges and brings sophisticated analytical, writing and communication skills to her work.

Reynolds is actively involved in the community, serving as a board member for the Adirondack Mountain Club and a former member of the North Country SPCA and Dewey Mountain Friends. She is a member of the New York State Bar Association. Since 2017, Reynolds has also taught yoga classes in Saranac Lake and Lake Placid.

Reynolds is originally from Baltimore, Maryland. She received a bachelor's degree from Dartmouth College, a master's degree from the University of

California, Santa Barbara, and a law degree from the Georgetown University Law Center. Before and during law school, Reynolds worked in New York City and Washington, D.C., for the firms Arnold and Porter and DLA Piper.

EXHIBIT C

NEW YORK STATE | Adirondack Park Agency

KATHY HOCHUL
Governor

BARBARA RICE
Executive Director

MEMORANDUM

TO: Regulatory Programs Committee

FROM: Sarah Reynolds, Associate Counsel SR

DATE: May 8, 2024

RE: Unconventional Concepts, Inc./Hopmeier
Permit Application 2021-0276
Appeal of Agency staff's January 2024 request for information

Summary

Unconventional Concepts, Inc. (UCI) seeks a permit from the Adirondack Park Agency to allow for the establishment of a commercial use involving the installation of a firing range for the testing of artillery on Rural Use lands in the Town of Lewis, Essex County. On January 2, 2024, Agency staff forwarded a fifth request for information regarding the application. On February 29, 2024, the applicant submitted an appeal of this request.

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposal. The type of weapon proposed for testing, the charge proposed for use with the weapon, specifics on the target and any other equipment proposed for use on the site, the proposed firing and target locations, and the number of shots proposed per day, month, and year, have all remained uncertain or changed. Even more significantly, the decibel level for the impulse noise source – the noise level produced at the moment of firing and the basis for any noise analysis – has changed with every response to staff's requests for information. In addition, none of the applicant's submissions have been stamped with the seal of a New York State-licensed professional engineer, as required under State professional standards for projects involving engineering principles and data.

The first four Notices of Incomplete Permit Application (NIPAs), along with numerous follow-up letters and meetings with the applicant, reflect staff's efforts to confirm the specifics of the proposed project and the resulting analysis of potential impacts. The fifth NIPA constitutes a further attempt to determine the information necessary for a complete application, with questions addressing previously submitted information that has changed or has remained unclear or unanswered.

The applicant's February 29, 2024, appeal of the fifth NIPA includes new information that has not been previously provided to the Agency. Staff analysis of this new information indicates that the record now contains sufficient documentation to allow for review of the proposal in relation to Questions 3 and 5 of the fifth NIPA. However, Questions 1, 2, 4, 6, 7, 8, and 9 remain unanswered.

Given the continuing inconsistencies in the record and the potential for impacts from the proposal, staff request that the Agency members affirm the need for the information requested in Questions 1, 2, 4, 6, 7, 8, and 9 of the fifth NIPA.

Legal Background and Review Process

The proposal at issue involves a new commercial use on Rural Use lands, and requires an Agency permit under the Adirondack Park Agency Act (APA Act). Prior to approving this project, the Agency must find that the proposal:

- will be consistent with the land use and development plan;
- will be compatible with the character description and purposes, policies, and objectives of the Rural Use land use area;
- will be consistent with the overall intensity guidelines for the Rural Use land use area;
- will comply with the shoreline restrictions of § 806 of the Act; and
- will not have an undue adverse impact upon the natural, scenic, aesthetic, ecological, wildlife, historic, recreational or open space resources of the Park or upon the ability of the public to provide supporting facilities and services made necessary by the project, taking into account the commercial, industrial, residential, recreational or other benefits that might be derived from the project.

Staff analyze any proposal that requires an Agency permit to ensure that the application is "complete for the purpose of commencing review," as set forth in §809(2)(b) of the APA Act. To do this, staff request information from applicants as necessary to allow for Agency consideration of the findings listed above. For any project not approved pursuant to the Agency's Delegation Resolution, staff make a recommendation to the Agency board as to whether the proposal appears approvable under the required findings, based on staff's analysis of the application materials. The Board may choose to follow or not follow staff's recommendation.

When a complete permit application contains sufficient information to allow the Agency to make the required findings, the Agency may approve the project, with conditions as necessary. When a complete permit application contains disputed facts or insufficient documentation to support approval, the Agency may require an adjudicatory-style public hearing on the proposal. The Agency may only deny a proposal after holding an adjudicatory-style hearing.

Relevant Facts and Project Review History

Project Site

The project site is a 197±-acre parcel of land located on Hale Hill Lane in the Town of Lewis, Essex County, in an area classified Rural Use on the Adirondack Park Land Use and Development Plan Map. The site is identified as Tax Map Section 38.1 Block 1, Parcel 31, and is currently owned by Pulsifer Logging, LLC.

The eastern portion of the project site contains two mountains, Little Church Mountain and Big Church Mountain, which are approximately 1,500 to 1,600 feet in height. A 50±-acre parcel of State lands included in the Taylor Pond Wild Forest adjoins the northeastern portion of the project site; the remainder of the site borders large tracts of Rural Use lands. The closest residence to the site is located approximately 5,800 feet to the northeast, and is currently owned by James Pulsifer. Additional residences are located along Hale Hill Road to the north and east of the site, along State Route 9 to the east of the site, and along Pulsifer Road to the south of the site.

A pre-existing missile silo, currently used as a commercial use, is owned by Diversified Upstate Enterprises, LLC, and located just over a mile to the east of the site. In addition, a sawmill subject to Agency permits is located just under a mile to the north of the site, and the "Oak Hill" mine, also subject to Agency permits, is located approximately a mile and a half to the south. Additional State lands in the Taylor Pond Wild Forest are located to the east and west, and the Jay Mountain Wilderness Area is located approximately two miles to the north and west of the site.

The project site is accessed by an existing drive used for timber harvesting. The site is currently improved by a cabin. A trail traverses the northwestern portion of the site and connects to adjacent Rural Use parcels.

Jurisdictional Inquiry and Permit Application

On August 26, 2021, the Agency received a Jurisdictional Inquiry Form from Michael Hopmeier for the installation of a ballistic testing range on the project site. The Agency responded to this inquiry on September 22, 2021, advising that the proposal involved the establishment of a new commercial use, and that an Agency permit would be required.

On November 19, 2021, the Agency received a permit application from Michael Hopmeier as Project Sponsor and James Pulsifer as representative for landowner Pulsifer Logging, LLC, for the establishment of a new commercial use. Specifically, the application proposed leasing a portion of the project site for the establishment of a "firing range" to:

> be developed and used to assess the internal ballistics of various kinetic systems used by the United States. The focus is to determine the effectiveness of various manufacturing approaches and techniques used in the manufacture of cannon barrels. The goal of the overall project is to decrease the weight of these systems to ensure the most efficient means of manufacturing and recuring cost of ownership, thereby reducing waste and cost, as well as improving performance... In effect, we are building a shooting range and will fire non-toxic, inert, steel projectiles over a distance of approximately 300 yards [or 900 feet].

The testing of artillery would occur in coordination with work occurring at the missile silo facility located to the east of the project site.

The application stated that "no more than three tests per month are anticipated," with operations occurring in "all seasons" and each test consisting of 1-3 shots over 1-2 days between 10am and 4pm on weekdays, and "an average of no more than 30 shots per year." Impulse noise from each shot was "not expected to exceed 180dB." The application also explained that "a small grouping of mountains" on the site would "act as a projectile backstop... thereby allowing for the reflection/deflection of noise away from more populated areas and into a large open space that can absorb and dampen any impact."

The application stated that approximately 100 tons of gravel from the Oak Hill mine would be used to construct an approximately 100-foot by 100-foot firing platform structure; other site work would include "clearing brush and a limited number of trees," using "herbicides to control unrestricted undergrowth," and using the existing access road to bring in materials for each test, including "a mobile power supply such as a generator on a trailer, portable instrumentation carriers, a trailer, a porta potty, and other mobile support equipment." The application noted that "a portable steel cargo container... filled with sand or other aggregate" might be brought on the site as "a projectile-catcher," but was "not expected to be necessary." The application did not offer any further specifics on the type of equipment or weapons that would be used on the project site.

Maps included with the application showed the location of the existing cabin on the property and the general location of the proposed firing pad and range.

First Notice of Incomplete Permit Application and Response

On December 6, 2021, Agency staff issued a first NIPA for the project. This first NIPA included requests for:

- A site map depicting the lease subdivision lines to allow for confirmation of potential subdivision jurisdiction, and documentation of the location of the other proposed activities;

- A noise impact evaluation using the NYS DEC Program Policy for Assessing and Mitigating Noise Impact (DEC Noise Policy)[1];
- Confirmation as to whether any contaminants would be used on site;
- Confirmation as to whether improvements to the existing access road would be required;
- Additional plans, including a plan for removal of spent projectiles, a design guide, a stormwater management plan, an unexploded ordnance plan, and a decommissioning plan;
- An alternatives analysis; and
- Information regarding coordination with other federal, state, and local agencies.

On December 15, 2021, Agency staff attended a site visit with the applicant. On December 22, 2021, the Agency received from the applicant a response to the first NIPA. This response included an un-scaled aerial photograph overlaid with approximations of the proposed lease and firing range areas. In response to staff's questions regarding contaminants and the removal of spent projectiles, the response stated that the "projectiles used during testing will normally consist of solid bullets of steel" and that, "in the event a target is used... the current design envisions a contained quantity of sand or soil (approximately 8 X 8 X 40 ft) into which projectiles will be fired," but noted that "this design may be modified based on actual operation and empirical data." The response also stated that, "if operations do not require a target, then direct impact into the ground... and projectile recovery will be utilized."

The December 22, 2021, response included a written noise evaluation and overlays of aerial photographs using "a complex non-linear topographic multi-variate inverse square law model for noise distribution that considered propagation over a distance, insertion of a barrier, ground effect, and air absorption" to examine impacts at two receptors: the missile silo located just over a mile to the east of the site, and the Pulsifer residence located just over a mile to the northeast. The evaluation stated that the noise level at the location of firing was "not expected to exceed 185 dB." A noise source of 183 dB was used in the calculations, based on which the applicant stated that "we can anticipate a reduction at both sites to approximately 82 dB centered on 125 Hz peak energy frequency, or a reduction of 101 dB." The evaluation then listed the noise levels of shotguns, rifles, Magnums, chainsaws, and thunder from nearby lightning strikes. For mitigation, the December 22, 2021, response proposed following the blasting notification procedures used by the nearby Oak Hill mine, which would be "part of the [firing range's] site security and operations plan." The noise evaluation was not signed by an engineer or any other New York State licensed professional.

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[1] When reviewing projects, Agency staff regularly require completion of a noise impact evaluation for the proposed activity following the review standards established by the DEC in its Program Policy for Assessing and Mitigating Noise Impact. The DEC Noise Policy is available on the DEC website at Assessing and Mitigating Noise Impacts (ny.gov).

The December 22, 2021, response asserted that no stormwater management plan, unexploded ordnance plan, or decommissioning plan was necessary, and declined to confirm whether the proposal involved any upgrades to the existing access road. The applicant also declined to provide a design guide, stating that, "We will be working closely with the US Army Development Command... they will provide guidance and approval for the range design and operating procedures... All operations will be in accordance with either approved and designated Army protocols, or based on best engineering and technical judgment developed in coordination with relevant Army staff and personnel." In relation to potential alternatives, the response stated that "other sites... were considered," but were not chosen because of the existing natural features of the project site. The response declined to propose any on-site alternatives, such as a berm or other sound barrier as suggested by the DEC Noise Policy.

Second Notice of Incomplete Permit Application and Response

On January 13, 2022, Agency staff issued a second NIPA for the project. This second NIPA included requests for:

- A site map and documentation of the location of the proposed activities, including the lease subdivision lines and other details;
- A revised noise impact evaluation using 185 dB as the maximum anticipated impulse noise level as referenced in the applicant's December 22, 2021, response and analyzing potential noise impacts to additional receptors within a two-mile radius;[2]
- A noise mitigation plan, as well as the "site security and safety operations plan" referenced as providing for noise mitigation in the applicant's December 22, 2021, response;
- Information regarding the existing trail that traverses the project site and connects to adjacent private lands;
- An additional analysis of alternatives to the proposal; and
- Additional coordination between the Agency and other state and federal entities.

On February 11, 2022, the Agency received from the applicant a partial response to the second NIPA. This partial response stated that, according to the landowner, there are no outside parties with the right to access the road/trail that traverses the project site. In relation to staff's request for an additional analysis of alternatives, the partial response stated that "it would be impractical to move the testing to a location farther from" the missile silo to the east of the site and that "any attempt to relocate the testing to a significantly more distant area would be cost prohibitive." Finally, in relation to staff's request for an updated noise impact evaluation, this partial response "revised the numbers in the model to accurately reflect the impulse noise value of 185 dBa."[3] The

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[2] Pursuant to the DEC Noise Policy, noise evaluations require determining and calculating potential impacts from "the maximum amount of sound created at a single point."

results of this updated assessment were shown on a "Noise Map" depicting noise levels overlaid on an aerial photograph of the area.

At the applicant's request, on February 25, 2022, Agency staff attended a meeting with the applicant to discuss the second NIPA and the materials received on February 11, 2022. Following this meeting and a follow-up letter from staff to the applicant on March 1, 2022, confirming that portions of the second NIPA were considered "either satisfied or no longer required," on May 12, 2022, the Agency received from the applicant an additional response to the second NIPA. In relation to staff's request for a scaled site plan, this additional response included two scaled plans showing a portion of the project site. No lease subdivision lines were shown on these plans. In addition, no dimensions or distances were shown, and not all markings were labeled. According to the scale on the plans, the firing pad measured approximately 30 feet by 80 feet, and the distance between the pad and the target measured approximately 571 feet.

The additional response received on May 12, 2022, stated that, "based on recommendation from the APA, further research on the noise source was performed," with the noise source now "assumed to be 166.1 dB." Specifically, in two locations, the May 12, 2022, response described the "Noise Source" as a "M109A5/6; Paladin, 155mm self-propelled Howitzer firing M4A2 zone 7 charges," with a "Noise Level" of 166.1 dB. The reference materials cited for this noise level showed that the 166.1 dB measurement was taken from "in fighting compartment with hatches open except drivers," rather than from open air firings.

The additional response received on May 12, 2022, also stated that the proposal had been updated to use a soft catch system for projectiles, rather than using direct impact into the mountains as the target as previously proposed. Using an "ambient noise level... assumed to be approximately 80 dB at the [Pulsifer] residence," the additional response then included a series of calculations performed by the applicant and concluded that "there is a negligible difference in noise level [at the Pulsifer residence] across an 8-hr day between a day when two shots are fired and [a] day when no shots are fired." No calculations were provided for any other potential noise receptors, and the noise evaluation was not signed by an engineer or any other New York State licensed professional.

In relation to the Agency's request for a noise mitigation plan, the additional response received on May 12, 2022, described "active noise mitigation measures," such as

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[3] This is the first incidence in the record of a reference to dBa (also referred to as dBA or dB(A)). According to the DEC Noise Policy, "perceived loudness is expressed in decibels (dB) or A-weighted decibel scale dB(A) which is weighted towards those portions of the frequency spectrum, between 20 and 20,000 Hertz, to which the human ear is most sensitive." In general, the same impulse noise source level would be expressed as a higher number when measured in decibels (dB) than in A-weighted decibels (dB(A)). The applicant's submissions vary between references to dB and dB(A) in relation to the impulse noise level and noise impact evaluation. Question 9 of the fifth NIPA requests an updated noise impact evaluation documenting both dB and dB(A) measurements for all relevant sound pressure levels.

limiting the number of shots fired annually, limiting the hours of operation, and providing "early warning of the event" pursuant to the procedures used by the nearby Oak Hill Mine as well as "audible warnings (siren) that can be discerned at" the Pulsifer residence, and concluded that the proposal was "not expected to cause any hearing damage or increases in anxiety or stress in nearby residents." The additional response also described "passive noise mitigation measures," such as the distance from the Pulsifer residence to the proposed testing range, the natural vegetation and local topography, and the fact that, because of "the rock structure of the mountains," noise coming from the proposed range "will be reflected back to the west," toward State lands and "away from the residences and populations in the surrounding areas." The response proposed no new noise mitigation measures.

Third Notice of Incomplete Permit Application and Response

On June 6, 2022, Agency staff issued a third NIPA for the project. This third NIPA included requests for:

- An updated site map with all markings labeled that depicted and confirmed the size of the lease area, which remained unknown, and the dimensions and locations of the firing pad and target area, which appeared to have changed from the initial application;
- An updated noise impact evaluation comporting with the DEC Noise Policy, prepared by a NYS licensed professional, and including an explanation of the decrease in proposed maximum noise levels from 185 dB to 166.1 dB;
- An explanation of the assumed ambient noise level of 80 dB at the site and the Pulsifer residence;
- Clarification of the procedures for public notification of tests;
- Inclusion of additional noise mitigation measures;
- Confirmation of the equipment and machinery proposed for use on site; and
- Clarification of numerous other discrepancies between submissions.

The third NIPA noted that "the proposal as presented consists of testing munitions year-round up to 120 times per year with an estimated munitions firing noise source of 185 dB with no noise source mitigation measures proposed," while the U.S. Department of the Army considers any impulse noise greater than 140 dB to be hazardous, and the US Bureau of Mining has documented damage to residential dwelling window glass from over air pressure blasts of greater than 133 dB.

On September 16, 2022, and November 9, 2022, the Agency received from H2H Associates, LLC (now H2H Geoscience Engineering, PLLC; referred to herein as H2H) an initial and revised Scope of Work proposal for performing a noise analysis at the project site. Staff responded to these letters on September 28, 2022, and November 28, 2022. The specific changes to the Scope of Work requested in staff's responses were later incorporated by H2H, though no final approval of the proposed Scope of Work was ever issued by staff.

On February 28, 2023, the Agency received a partial response to the third NIPA from Matthew Norfolk, Esq., as attorney for UCI, which was now described as the applicant. This response stated that the applicant was no longer proposing a lease subdivision, and would instead "have access to the area at certain times to perform ballistic testing in coordination with" the landowner.

In response to staff's request for clarification of the dimensions and locations of the firing pad and target area, the February 28, 2023, response stated that: "The specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time."

In response to staff's request for confirmation as to the equipment and machinery proposed for use on site, the February 28, 2023, response declined to name any specifics, instead stating only that "all vehicles and equipment used on site will not exceed current noise levels created by" vehicles commonly used in sawmill operations. In response to staff's request for clarification of the procedures for public notification of tests, the response stated that, seven days prior to any test, UCI would notify the Town and mail notice to landowners "within a two-mile radius."

On March 1, 2023, the Agency received a document titled "Sound Study Unconventional Concepts, Inc. APA Project #2021-0276," prepared by H2H, and dated February 2023 (February 2023 Sound Study). The Project Background section introducing the February 2023 Sound Study included an explanation of the proposed testing process: "Each test will consist of four-five shots, and each series of shots will last no more than two days. Testing will only occur on weekdays, between 10:00 AM and 4:00 PM local time. No more than two shots will be fired in one day... The Sound Source (system being tested) will be located on a 100 ft. X 100 ft. crushed gravel pad (Firing Pad)... The Target Area is 590 ft. east of the Firing Pad."

The February 2023 Sound Study updated the specific weapon proposed for firing at the project site: an M109A3GN (155 mm) Howitzer. The February 2023 Sound Study also clarified for the first time some of the additional equipment proposed for use: a 40-ton haul truck for transporting the howitzer and other materials to and from and across the site.

The February 2023 Sound Study named 176 dB(A) as the noise level for the howitzer, stating that this "sound level data for the Sound Source is provided in" an older study, titled "Noise emission data for M109, 155 mm field howitzer," prepared by Morten Huseby for the Norwegian Defence Research Establishment, and dated December 5, 2007 (the 2007 Norwegian Study). The 2007 Norwegian Study, which was included with the materials received on March 1, 2023, examined the firing of M109, 155 mm field howitzers with a charge of up to 5 modules DM72, with each module containing 2.44 kilograms propelling charge.

The 2007 Norwegian Study was "conducted at the Norwegian Defence Research Establishment... to estimate noise pollution around military firing ranges." The study stated that the "M109 [Howitzer] is one of the noisiest weapons in the Norwegian defence, and as such represents a limiting factor for activity at firing ranges and training fields." The Study also repeatedly stated that, to the author's knowledge, there existed no "consensus" or "commonly accepted methods" for producing free field emission data to use for analyzing potential sound impact levels from howitzers.

Using 176 dB(A) as the noise source, the February 2023 Sound Study modeled impulse sound levels at five receptors within two miles of the project site: Receptors M-1, M-2, and M-3 located along residential lands to the east and south of the site, and Receptors M-4 and M-5 located on State lands to the west and northeast of the site. The modeled impulse sound levels were calculated as 75, 71, and 73 dB(A) at Receptors M-1, M-2, and M-3; 79 dB(A) at Receptor M-4; and 107 dB(A) at Receptor M-5.

As part of the February 2023 Sound Study, H2H also recorded and modeled ambient noise levels at the receptor sites, and then charted the difference between the ambient sound levels and the modeled impulse sound levels. The study modeled the impulse noise as being between 17.8 dB(A) and 72.3 dB(A) higher than the ambient noise levels.

Finally, the February 2023 Sound Study analyzed the overall change in ambient sound levels that would occur during the six-hour period from 10am to 4pm on a day with two shots fired. This modeling found that, because the impulse noises were so short, the increase in overall ambient noise levels over the six-hour period ranged from 0 to 0.4 dB(A) at Receptors M-1 through M-3, and from 2.0 to 32.0 at Receptors M-4 and M-5. The Study then found that "the proposed project does not pose a potentially significant environmental impact due to an increase in sound levels at receptors in the area."

The February 2023 Sound Study included an overlay of an aerial photograph, labeled Figure 1 – Site Overview Map. Figure 1 is scaled at 1 inch : 1,000 feet, and shows the region of the project site and approximate locations of the firing pad, howitzer, target, and property lines.

The February 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

Fourth Notice of Incomplete Permit Application and Response

On March 16, 2023, Agency staff issued a fourth NIPA for the project. This fourth NIPA included requests for:

- A revised noise impact evaluation that complies with the DEC Noise Policy, clarifies and documents the method for determining 176 dB(A) as the accurate noise source level for the howitzer, clarifies and documents the modeling used

for sound levels at the receptor sites, and clarifies numerous facts and other discrepancies among the prior submissions, including between the number of shots proposed for each test and the proposed charge for each test; and

- Confirmation of the equipment proposed for use at the site, noting that an "armored tracked vehicle" was documented as transporting the howitzer in the 2007 Norwegian Study.

The fourth NIPA also stated that, "until an acceptable full noise assessment has been provided, the Agency cannot assess whether the currently proposed public notification and mitigation is adequate."

At the applicant's request, on June 26, 2023, Agency staff attended a meeting with the applicant to discuss the fourth NIPA. On August 1, 2023, the Agency received from UCI a partial response to the fourth NIPA. In response to staff's questions regarding the noise source level for the proposed howitzer and the modeling used for sound levels at the receptor sites, the UCI response noted that the applicant had been required "to develop data that could be used to model the attenuation of sound produced by a howitzer due to the previous lack of available information."

In response to staff's request for confirmation of the equipment proposed for use at the site, the August 1, 2023, UCI response reiterated the applicant's earlier assertion that only "a diesel truck similar to what has historically operated on site in support of logging activities will be used to transport the" howitzer around the site. In response to staff's request for clarification of the number of shots proposed for each test, the response stated that no more than two shots are proposed for any given day, with up to three days of shots associated with each test. Finally, in response to staff's question regarding the maximum proposed charge, the response asserted that "the level of sound for all charge sizes employed will not exceed those acceptable levels determined by H2H's assessments and testing." The response concluded that "there are no other practicable means to mitigate noise."

The August 1, 2023, UCI response stated that "the Source sound power level was transcribed incorrectly in the H2H February 2023 Sound Study Report. Source sound power level is 180.8 dB (163.2 dB(A)), not 175.9 dB."

An updated Sound Study, prepared by H2H, dated July 2023, and included with the partial response (the July 2023 Sound Study), explained that the 180.8 dB sound power level was determined by using a Table in the 2007 Norwegian Study that documented a sound pressure level of 130.5 dB at a sensor located 803 feet away and at a 32-degree angle from a howitzer. There is no indication of variables such as terrain, vegetation, or wind and temperature conditions at the time of firing in the 2007 Norwegian Study. Nevertheless, using "industry standard calculations," the applicant used its own model to calculate back to determine the originating sound pressure level for the howitzer in the Norwegian study, and then determined that the sound level would be 127 dB at this same distance and angle from a howitzer on the project site. The July 2023 Sound

Study then asserted that the difference of 3.5 dB between the 130.5 dB recorded sound pressure reading in the Norwegian study and the applicant's modeled sound pressure reading of 127 dB showed "correlation within ISO standards." Therefore, according to the applicant, a level of 180.8 dB at the location of the howitzer should be considered accurate.

The July 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

On August 16, 2023, Agency staff issued a letter confirming receipt of the August 1, 2023, response, and noting that the Sound Study had not been sufficiently updated as requested and that the response had not confirmed the maximum charge proposed. The letter noted that, using the applicant's modeled potential error discrepancy of 3.5 dB, the application documented a potential for impulse noise levels at nearby State lands above the 133-dB level determined capable of breaking windows as documented by the US Bureau of Mining.

On December 15, 2023, the Agency received from UCI an additional response to the fourth NIPA. For the first time in the application process, this additional response proposed a noise mitigation measure that did not rely on the natural features of the site or notification to nearby landowners: the applicant now proposed to install a "Sound Mitigation Berm" on the site. The response stated that the berm would be 13 feet in height and "constructed along the northern boundary of the Firing Pad," but gave no specifics on the materials that would be used for construction or the location of the berm in relation to the howitzer. The December 15, 2023, UCI response also included modeling of sound levels by temperature and humidity, noting that "testing is not anticipated to take place" at lower temperatures, as well as additional sound power level and sound pressure level calculations, charts, and conclusions.

An updated Sound Study, prepared by H2H and dated September 2023 (the September 2023 Sound Study), was included with the materials received on December 15, 2023. The September 2023 Sound Study modeled impulse sound levels at Receptors M-1 through M-5 with and without the berm, although the study did not contain the modeling of sound levels by temperature and humidity or the additional sound power level and sound pressure level calculations, charts, and conclusions submitted with the UCI response.

The September 2023 Sound Study included a new color-coded model of sound pressure levels. This model is labeled "Image 1," and is described by the September 2023 Sound Study as "demonstrat[ing] the accuracy of the sound propagation model." "Image 1" appears to be an overlay of an aerial photograph of the site, although the locations of the firing pad, howitzer, target, and property lines are not visible. The September 2023 Sound Study also included the aerial photograph overlay labeled Figure 1 – Site Overview Map that had been included with the prior sound studies; this map shows the region of the project site with the locations of the firing pad, howitzer,

target, and property lines approximated, but without the color-coded sound pressure level modeling distinct to "Image 1."

The September 2023 Sound Study was not signed by an engineer or any other New York State licensed professional.

On January 2, 2024, Agency staff issued a fifth NIPA for the project. On January 18, 2024, the Agency received a request for an extension to the deadline for filing an appeal of the fifth NIPA pursuant to 9 NYCRR § 572.22(c). On January 18, 2024, staff responded by letter agreeing to the extension. On February 29, 2024, the Agency received the applicant's appeal of the fifth NIPA.

Appeal

Pages 1-12 of the appeal contain a summary by the applicant of the history of project submissions and Agency staff responses regarding the proposed firing range. Staff disagree with a number of the factual and other statements made in this summary. The applicant's summary, along with all other submissions and staff correspondence, are part of the record for this appeal.

The matter presented for review and action by the Agency members at this time is a challenge to the questions included by staff in the fifth NIPA. However, staff analysis of new information included in the appeal indicates that the application now contains sufficient information to allow for analysis of the proposal in relation to Questions 3 and 5. Accordingly, the remaining challenges to the fifth NIPA involve Questions 1, 2, 4, 6, 7, 8, and 9.

Responses Considered Sufficient

- Question 3 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the impulse noise level and location of proposed noise source. The maximum impulse noise level was stated as 180 dB in the initial application on November 21, 2021, 185 dB in the response to the first NIPA, 185 dB and then 166.1 dB in response to the second NIPA, 176 dB(A) in response to the third NIPA, and 180.8 dB (163.2 dB(A)) in response to the fourth NIPA. The proposed size and location of the firing pad has also been inconsistent throughout the applicant's submissions. Staff have continually noted that, due to the potential for impacts based on the impulse noise level and location of proposed noise source, additional noise mitigation measures may be required.

Until December 15, 2023, the applicant's responses to these comments regarding mitigation centered on the mitigation measures described in the initial application: that notification to nearby landowners of upcoming tests would not cause hearing damage or

increase anxiety or stress in nearby residents, and that the natural features of the site would reflect noise away from residences and towards uninhabited State lands to the west. On December 15, 2023, in a response to the fourth NIPA, the applicant proposed installing a berm as a new mitigation measure.

Question 3 of the fifth NIPA recommended additional potential mitigation measures, and requested an evaluation of whether any could be added to further limit noise impacts from the proposal. The applicant responded to this question on page 15 of the appeal, explaining that these additional measures would be unacceptable.

For the purpose of commencing review, staff have no additional questions regarding this issue. The applicant's response, along with staff's technical review and analysis, will be included as part of the permit application for future Agency review.

- Question 5 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposed timing and number of shots. Specifically, the initial application stated that there would be an average of 30 total shots per year under the proposal, but according to later submissions, there would be up to 10 shots per month, year-round. In addition, the applicant's December 15, 2023, written response suggested that no testing would occur at times of the year with lower temperatures, despite earlier indications that testing would occur in all months.

Question 5 of the fifth NIPA requested confirmation of the proposed maximum number of shots per week, month, and year, and whether there were any atmospheric conditions under which testing would not occur. The applicant responded to this question on pages 16-17 of the appeal, confirming that testing is proposed to occur year-round, with a maximum of 10 shots per month, and with no atmospheric restrictions.

For the purpose of commencing review, staff have no additional questions regarding this issue. The applicant's response, along with staff's technical review and analysis, will be included as part of the permit application for future Agency review.

Questions Remaining

- Question 1 of the fifth NIPA

Since receipt of the initial application on November 21, 2021, the applicant's submissions have provided incomplete and conflicting information regarding the proposed location of the noise source and the distance between the noise source and the private and State land receptor sites used in the noise analysis. As noted in the first paragraph of Question 1 of the fifth NIPA, in a submission received on February 28,

2023, the applicant stated that the location and distance would vary from test to test: "The specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time." Noise impact evaluations depend on calculations using precise locations and distances; accordingly, the exact locations and distances must either be confirmed and used in the noise analysis, or the analysis must account for the worst-case-scenario for these factors.

> Staff request: *"Please provide cross-section sheet(s) depicting the proposed typical M109 155 mm howitzer and assembly set up to be utilized on site, including all proposed instrumentation and test articles, that is drawn to scale and depicts howitzer barrel and assembly dimensions and muzzle location. Please label the location of the noise source and its associated sound pressure level source height as measured from the finished grade of the pad."*

This request attempts to document the size of the proposed howitzer in face view. In particular, the requested sheet(s) would document the distance of the muzzle – which was the noise source location used in the 2007 Norwegian Study – from the rest of the artillery, and the height of the muzzle from the ground or firing pad.

> Staff request: *"To allow for review of worst-case scenario noise impacts, please provide scaled cross-section plan sheet(s) depicting the distance between the closest point of the proposed gravel pad or the noise source, whichever is closer, to each of M1-M5, and between the closest point of the proposed gravel pad and the receptor located at the southwest corner of the nearest state land parcel. Please depict the proposed berm on each of these plan sheets."*

This request attempts to document the location of the proposed howitzer in plan view. In particular, the requested sheet(s) would document and confirm the distance of the noise source from the receptor sites used in the noise impact evaluation. In addition, as the only indication in the record of the location for the proposed berm is that it would be "constructed along the northern boundary of the Firing Pad," this request also requires a scaled depiction of the berm in plan view.

The appeal states that "previous submissions" show that the "howitzer barrel assembly" will be "located in the center of the 100-foot by 100-foot firing pad;" however, a search of the record by staff finds no evidence that this information has been previously submitted. The appeal also supplies calculations not previously in the record purporting to model sound pressure levels at Receptors M-1 through M-5 with the sound source at "the edge of the firing pad;" however, these calculations were not provided and stamped by a NYS-licensed engineer and, in any event, do not account for the possibility of the noise source extending beyond the edge of the pad toward the receptor sites. Finally, the appeal points to the fact that the H2H Sound Studies use "a Sound Source height of

6.5 feet;" however, there remains no documentation in the record that 6.5 feet is or will be the accurate height of the noise source from the ground or firing pad.

As noise impact evaluations depend on calculations using precise locations and distances, the exact locations and distances must either be confirmed and used in the noise analysis, or the analysis must account for the worst-case-scenario for these factors. Therefore, given the importance of documenting and confirming the exact location of the proposed noise source in relation to the receptor sites, staff request that the Agency members affirm the need for the plan sheets requested in Question 1 of the fifth NIPA.

- Question 2 of the fifth NIPA

  Staff request: *"Please clarify what materials the berm will be constructed with, and any associated stabilization measures and other erosion and sediment controls."*

Despite numerous requests and suggestions for potential noise mitigation measures, no on-site mitigation was proposed until December 15, 2023, in the additional response to the fourth NIPA, when the applicant proposed installation of a berm "along the northern boundary of the Firing Pad." The record contains no specifics on the materials that would be used for construction, the location of the berm in relation to the noise source, or even whether the berm would be permanent or temporary and subject to movement or re-construction for individual tests.

As noted in the DEC Noise Policy, installation of a berm can be helpful in reducing potential noise impacts. However, any reduction in noise would depend on the type, size, and location of the berm in relation to the noise source; these factors must be known to allow for calculations of the angle of reflection and barrier attenuation. In addition, stabilization measures and erosion and sediment controls are sometimes necessary to protect nearby resources from berms, depending on the materials and method used for construction.

Given the importance of documenting the details related to the proposed berm, staff request that the Agency members affirm the need for the information requested in Question 2 of the fifth NIPA.

- Question 4 of the fifth NIPA

  Staff request: *"Please explain why there are separate tables, calculations and conclusions made in the UCI written response received on December 7, 2023, that are not included in the [September 2023 Sound Study by H2H]."*

UCI's December 15, 2023, additional response to the fourth NIPA included modeling of sound levels by temperature and humidity and other sound power level and sound

pressure level calculations, charts, and conclusions that are not included or reflected in the September 2023 Sound Study completed by H2H. Question 4 of the fifth NIPA attempts to reconcile these differences, to ensure that the record for Agency review and decision reflects consensus on the final proposal and modeled impacts.

Given the importance of documenting the details related to potential noise impacts, staff request that the Agency members affirm the need for the information requested in Question 4 of the fifth NIPA.

- Question 6 of the fifth NIPA

  Staff request: *"Please revise Image 1 to depict the location of the 100-foot by 100-foot pad, all state land boundaries, the southwest corner of the nearest state land parcel located approximately 300 feet from the northeast corner of the firing pad, the nearest dwellings (including the Pulsifer residence), receptor locations M1 – M4, and the closest point of the proposed gravel pad or the noise source, whichever is closer, to each receptor."*

H2H's September 2023 Sound Study modeled impulse sound levels at Receptors M-1 through M-5 with and without the berm. The study then asserted that "the accuracy of th[is] sound propagation model" was demonstrated in "Image 1."

"Image 1" is a color-coded model of sound pressure levels that was first submitted to the Agency with the September 2023 Sound Study, received on December 15, 2023. "Image 1" appears to be an overlay of an aerial photograph of the site; the locations of the firing pad, howitzer, target, and property lines are illegibly hidden beneath the color-coding of sound pressure levels.

In the appeal, the applicant states that Question 6 has been "asked and answered," because "UCI has already supplied Agency Staff with the requested information in Figure 1, 'Site Overview Map,' provided in H2H's September 2023 Sound Study." However, while Figure 1 in the September 2023 Sound Study does approximate the locations of the firing pad, howitzer, target, and property lines on an aerial photograph, Figure 1 does not contain the color-coded sound pressure level modeling distinct to "Image 1."

Given the importance of documenting the accuracy of the sound propagation model used in the sound studies in the record and the applicant's insistence that "Image 1" provides this documentation, staff request that the Agency members affirm the need for the revision to "Image 1" requested in Question 6 of the fifth NIPA.

- Question 7 of the fifth NIPA

In response to the request in the fourth NIPA for information as to how the decibel level of the noise source was determined by the applicant, the July 2023 Sound Study and

the September 2023 Sound Study both state that the level was calculated using a Table in the 2007 Norwegian Study. Specifically, the sound studies explain that this table showed a documented sound pressure level of 130.5 dB at a sensor located 803 feet away and at a 32-degree angle from a howitzer. There is no indication of variables such as terrain, vegetation, or wind and temperature conditions at the time of firing in the 2007 Norwegian Study. Nevertheless, using "industry standard calculations," the applicant used its own model to calculate back to determine the originating sound pressure level for the howitzer in the Norwegian study, and then determined that the sound level would be 127 dB at this same distance and angle from a howitzer on the project site. The July 2023 Sound Study then asserted that the difference of 3.5 dB between the 130.5 dB recorded sound pressure reading in the Norwegian study and the applicant's modeled sound pressure reading of 127 dB showed "correlation within ISO standards." Therefore, according to the applicant's response to the fourth NIPA, a sound power level of 180.8 dB at the location of the howitzer should be considered accurate.

> Staff request: *"Please provide an explanation of these ISO standards and the asserted correlation, including a clarification of whether the ISO standards are appropriately used in this context. Please also provide any other available documentation confirming that 3.5 dB is appropriately cited as the maximum limit of error for this proposal.*
>
> *Please confirm through field-verification at an authorized location and through independent third party verifications that 180.8 dB is the noise level produced by M109 155 mm howitzers."*

The DEC Noise Policy requires determining the maximum amount of sound created at a noise source, and then conducting a noise impact evaluation based on this level. Accordingly, it is imperative that the noise level of a noise source is accurately determined, to allow for analysis of potential impacts at receptor locations.

Question 7 of the fifth NIPA requests confirmation of the accuracy of the applicant's assertion of 180.8 dB as the noise level of an M109 155 mm howitzer. Staff remain concerned about the accuracy of this number for several reasons: every prior submission posited a different decibel level for the noise source; the 180.8 dB figure was calculated based a single measurement from one study in 2007 conducted in unknown conditions and with other unknown variables; the only confirmation of the accuracy of the applicant's calculation is based on their finding of a noise level 3.5 decibels lower than was documented in the 2007 Norwegian Study when the distance and angle of the 2007 measurement were inputted in the applicant's model; and the applicant asserts that a discrepancy of 3.5 decibels "show[s] correlation with ISO standards," where ISO standards have not been used in relation to other recent commercial and mining projects within the Park.

Given the importance of documenting the accuracy of the noise level of the noise source used in the sound studies in the record, staff request that the Agency members affirm the need for the information requested in Question 6 of the fifth NIPA.

- Question 8 of the fifth NIPA

  Staff request: *"The 'Noise emission data for M109, 155 mm field howitzer' study referenced in the [December 2023 Sound Study] references a maximum charge of 5 modules DM72 with each module containing 2.44 kilograms propelling charge, while USACHPPM materials referenced in the UCI response received by the Agency [on] July 18, 2022 reference the sound level for a M4A2 zone 7 charge. Please confirm that this will be the maximum charge used. Please also explain how the two charges compare and the effect [the charge] will have on the level of sound produced."*

UCI's May 12, 2022, submission to the Agency in response to the second NIPA described the noise source for the project as M4A2 zone 7 charges. However, the 2007 Norwegian Study, which was submitted on March 1, 2023, in response to the third NIPA and was used to model the decibel level of the proposed noise source for the H2H Sound Studies, involved a charge of up to 5 modules DM72, with each module containing 2.44 kilograms propelling charge.

The charge used in a howitzer may significantly alter the impulse noise level produced from firing. Accordingly, Question 8 of the fifth NIPA was first asked in the fourth NIPA, in response to the differing charges proposed after the second and third NIPAs. UCI's response to the fourth NIPA stated only that "the level of sound for all charge sizes employed will not exceed those acceptable levels determined by H2H's assessments and testing."

Given the importance of confirming that the maximum charge proposed will not result in impulse noise levels above the levels used in the sound studies in the record, staff request that the Agency members affirm the need for the information requested in Question 8 of the fifth NIPA.

- Question 9 of the fifth NIPA

  Staff request: *"Please provide an updated noise analysis that accounts for the confirmed height of the noise source from the gravel pad and the location of the noise source at the closest point of the gravel pad to each receptor. This updated noise analysis must include all tabular, calculated, and conclusory information included in the latest UCI response, Modal Data in Appendix D, and barrier attenuation calculations that account for the most conservative/worst case scenario height and location of the noise source in relation to each receptor. The updated noise analysis must also account for all proposed months of operation and any proposed atmospheric operating restrictions. In addition, the analysis*

must include revised tabular information, Modal Data in Appendix D, and barrier attenuation calculations that account for the height and location of the noise source in relation to each receptor, and must include sound pressure levels expressed as both dB and dBA. This updated analysis must include a cover sheet with the seal of a NYS licensed professional engineer."

Given the continuing inconsistencies in the record and the potential for impacts to Park resources from the proposal, staff request that the Agency members affirm the need for the updated noise impact evaluation requested in Question 9 of the fifth NIPA. In addition, as New York State professional standards require that projects involving the application of engineering principles and data be signed and stamped with the seal of a New York State licensed professional engineer, staff also request that the Agency members affirm the need for the updated noise impact evaluation to include a cover sheet with the appropriate seal.

Conclusion

For the reasons stated above, staff request that the Agency members affirm the need for responses to Questions 1, 2, 4, 6, 7, 8, and 9 of the NIPA.

EXHIBIT D

NORFOLK BEIER PLLC
ATTORNEYS AT LAW

February 29, 2024

Via Email and Hand Delivery

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Re: Project Sponsor: Michael Hopmeier, Unconventional Concepts, Inc.
APA Project No. 2021-0276

Dear Sirs:

Please find enclosed the Project Sponsor's appeal of the Fifth Notice of Incomplete Permit Application in connection with the above-referenced matter. The appeal is being filed pursuant to 9 N.Y.C.R.R. §572.22.

If you have any comments or questions please do not hesitate to contact me.

Sincerely,

Norfolk Beier PLLC

By:
Matthew D. Norfolk, Esq.
MDN:klm
Enc.

cc: Mr. Michael Hopmeier (Via Email Only)
Lori Settle (Via Email Only)
Erin Burns, Deputy Regional Permit Administrator NYDEC (Via First Class Mail Only)

NORFOLK BEIER PLLC
ATTORNEYS AT LAW

February 29, 2024

Via Email and Hand Delivery

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By:
Matthew D. Norfolk, Esq.
MDN:klm
Enc.

cc: Mr. Michael Hopmeier (Via Email Only)
Lori Settle (Via Email Only)
Erin Burns, Deputy Regional Permit Administrator NYDEC (Via First Class Mail Only)

NEW YORK STATE ADIRONDACK PARK AGENCY

In the Matter of APA Project No. 2021-0276,
Commercial Use – Ballistics Testing Facility
Project Sponsor: Michael Hopmeier of Unconventional Concepts, Inc.

APPEAL OF FIFTH NOTICE OF INCOMPLETE APPLICATION

Please take notice that, pursuant to 9 NYCRR §572.22(a), Project Sponsor Michael Hopmeier of Unconventional Concepts, Inc. (hereinafter referred to as "UCI") appeals, in part, *Fifth Notice of Incomplete Application*, dated January 2, 2024 (hereinafter referred to as the 5th NIPA), an action taken by David J. Plante, Deputy Director of Regulatory Programs of New York State Adirondack Park Agency (hereinafter referred to as the "Agency"); and

Please take further notice that this appeal is being filed on behalf of UCI by the law firm of Norfolk Beier PLLC, with Matthew D. Norfolk, Esq. being of counsel and UCI's Authorized Representative herein; and

Please take further notice that this appeal seeks a determination finding that: (1) all requests for information contained in the 5th NIPA are duplicative, unnecessary or moot as all information required for the project application to be complete has been submitted by UCI; (2) certain requests for information contained in the 5th NIPA are lacking relevancy to attaining a determination of application completion; (3) certain comments contained in the 5th NIPA must be stricken from the administrative record as they are based upon factual errors; (4) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to issue a *de facto* denial of the application; (5) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to alter or change the proposed project or use,

contrary to the intentions of UCI or prejudicial to UCI; (6) UCI's project application is complete; and, (7) pursuant to 9 NYCRR §572.22(h), providing notice of the completeness of the application as required by law and thereafter granting the permit application.

BACKGROUND FACTS AND PROJECT REVIEW HISTORY

Mr. Hopmeier is the President of UCI. UCI is a professional engineering and technical consulting firm specializing in issues related to national security. Typical projects involve high value, time critical programs which do not necessarily fall under the purview of conventional consulting firms or government agencies. Areas of expertise encompass development and transitioning of technologies from and to civilian, commercial, military, and government sectors. UCI does comprehensive strategy and policy reviews to validate concepts of application and operations. UCI has been instrumental in transitioning technologies through cooperative research and development agreements, cooperative agreements and commercial licensing agreements to support university and commercial sector research and development. UCI has also been instrumental in new business development and has supported the transition of explosive ordnance disposal training devices, medical testing equipment and antimicrobial solutions into commercial applications. UCI is a registered vendor in the United Nations Global Marketplace as a supplier to the United Nations.

The United States Army awarded UCI a contract to test and evaluate internal ballistics and kinetic and kinematic effects of various kinetic systems used by the United States military. In 2015, UCI purchased the decommissioned thermonuclear Atlas F missile launch facility located at 87 Hale Hill Lane in the Town of Lewis, New York (Tax Map Parcel No. 38.1-1-29.000).

Neighboring land at 195 Hale Hill Lane (Tax Map No. 38.1-1-31.000) was selected as the test site for its ideal physical attributes suited for kinetic system testing, requirements for minimal

environmental development, noise mitigation and site security. The terrain will act as a natural mitigator of sound. The site's isolation and controlled access also enhances safety and security.

On August 26, 2021, UCI submitted a Jurisdictional Inquiry Form to the Agency regarding development of a ballistic testing range at 195 Hale Hill Lane for purposes of performing under said contract with the United States Army. The Agency issued Jurisdictional Determination J2021-0870 on September 22, 2021, asserting jurisdiction "for any new commercial use on Rural Use lands in the Adirondack Park."

On November 12, 2021, more than two years ago, UCI submitted an application for the ballistics testing project. The project is described in paragraph 8 of the "Detailed Project Description," at pages 25-26 of the project application. Excerpts of the description are the following:

- **The range will have very limited access, be used sporadically throughout the year, and will only be used during daylight hours.**

- **All test equipment and instrumentation will be portable; equipment will be deployed as needed to the site for a test and will then be completely removed at the end of the test. No more than three tests per month are anticipated. Each test will consist of 1-3 shots, and each series of shots will last no more than 2 days. Local property owners who may be impacted (by noise) will be notified a minimum of one week in advance of the anticipated test. Testing will only occur on weekdays, between the hours of 10:00 AM and 4:00 PM local time.**

- **To minimize the impact on the local community and area, we plan to notify all interested parties (a list will be provided by the local town supervisor, consistent with the list used by the local mining operation), and each party will be notified a minimum of one week in advance prior to any firing. In addition, 24 hours prior to any firing, local law enforcement and 911 will also be notified in the event that anyone from the local community expresses concern. Further, we will invite local officials, to include elected representatives and law enforcement, to attend and observe operations as they occur. However, operations will not be open to the public; observation will be limited due to safety and security concerns.**

- **At the completion of each test series, all equipment, residue, and debris will be cleaned up and transported or managed on site appropriately. Debris will principally consist of the steel projectiles and any rubble created from impact with the ground.**

- **Continuous noise, primarily from the generator, is not expected to exceed 65 dB. Impulse noise with durations of less than one half of one second is not expected to exceed 180 dB.** (UCI's Application, "34. Operating Profile: Machinery" p. 29).

First Notice of Incomplete Permit Application

Agency Staff's *First Notice of Incomplete Permit Application* (hereinafter referred to as the "1st NIPA") was issued on December 6, 2021. A copy of the 1st NIPA is annexed hereto as **Attachment A**. In the 1st NIPA, Agency Staff requested "a thorough noise evaluation for all proposed munitions to be fired on site, including an evaluation of the nearest receptors utilizing the NYS DEC's Program Policy for Assessing and Mitigating Noise Impacts." In particular Agency Staff requested "a noise mitigation plan as necessary." (*See* Attachment A, p. 2).

On December 22, 2021, UCI submitted responsive documents (hereinafter referred to as "UCI's Response to 1st NIPA"). UCI explained in its response that "[t]he noise generated during testing is considered to be impulse noise rather than constant noise. It is vital to note that impulse noise affects people and the environment very differently than continuous noise, and is generally considered less annoying and impactful." (*See* UCI's Response to 1st NIPA, p. 3). UCI provided a noise map report based on non-linear topographical multi-variant inverse-square law modeling for the attenuation of the intensity of noise and provided an explanation of the selected values. (*See id.*, pp. 3-4 and Appendix B). This method was chosen as representing existing best practices and state-of-the-art analysis performed by audio engineer experts.

In compliance with New York State Department of Environmental Conservation (hereinafter referred to as the "DEC") *Program Policy for Assessing and Mitigating Noise Impacts*, Section V.B.1.b, the nearest inhabited receptor location of differing use than the proposed noise source was selected, being the Pulsifer residence, 1.22 miles away. (*See id.*, p. 4). In support of the selected 183 dB value for the noise source, UCI cited a reliable and recognized study published in the *Scandinavian Audiology* journal, as well as a list of noise levels of common military

equipment promulgated by the US Army Center for Health Promotion and Preventative Medicine Hearing Conservation Program. (*See DEC Program Policy*, pp. 3-4). UCI also provided comparison values for hunting firearms commonly used in the Adirondack Park and noted "noise at the receptor site is still projected to be at or below a wide array of existing and approved noise sources." (*See* UCI's Response to 1st NIPA, p. 4). In other words, the sound to be made from the ballistics testing, at the testing receptors, was equal to or less than that produced by the firing of a legal big game hunting rifle.

For noise impact mitigation, UCI proposed a procedure similar to that used and approved by the Agency for local mining operations. Furthermore, the result of UCI's studies and research found that "[b]ased on existing data and assessment, noise levels are not anticipated to exceed those produced by blast operations currently occurring one mile from the proposed site of the firing range." (*See* UCI's Response to 1st NIPA, p. 5).

Second Notice of Incomplete Permit Application

The Agency's *Second Notice of Incomplete Permit Application* (hereinafter referred to as the "2nd NIPA") was issued on January 13, 2022. A copy of the 2nd NIPA is annexed hereto as **Attachment B**. Without a coherent, scientific, or factually based rationale, Agency Staff disputed UCI's calculated noise pressure level for the noise source and requested "a more complete noise assessment report" to include all potential noise receptors within a minimum 2.0-mile radius from the munition firing source of 185 dBa. Agency Staff opined that the revised assessment report "should provide a detailed evaluation of the potential noise impacts to these receptors with respect to ambient sound pressure level." (*See* Attachment B, p. 2). In response, on February 11, 2022, UCI submitted a comprehensive response to the 2nd NIPA (hereinafter referred to as "UCI's

Response to 2nd NIPA"). Therein, UCI provided a revised sound map with an increased impulse noise value of 185 dB(A). (*See* UCI's Response to 2nd NIPA, Attachment A).

On March 1, 2022, by letter, Agency Staff requested supplemental information. A copy of this letter is annexed hereto as **Attachment C**. On May 12, 2022, UCI provided supplemental responses to Agency Staff's March 1, 2022 request (hereinafter referred to as "UCI's Supplemental Response"). UCI's Supplemental Response included an updated noise assessment indicating an ambient noise level at the Pulsifer residence of 80 dB based on that receptor's proximity to a sawmill and diesel truck refueling site. (*See* UCI's Supplemental Response, p. 3, Appendix D). The updated noise assessment included a detailed paragraph-by-paragraph breakdown of the computations, reasons for their selection, and explanation of the methodology used to conclude the impulse noise from the ballistic testing will not exceed the ambient noise level at the nearest off-site residence. (*See id.*, pp. 12-33, Appendix D). The supplemental response also provided Agency Staff with UCI's *Sound Mitigation and Control Annex of the Security and Safety Plan* concerning the proposed project. (*See id.*, pp. 4-6).

Third Notice of Incomplete Permit Application

Agency Staff's *Third Notice of Incomplete Permit Application* (hereinafter referred to as the "3rd NIPA") was issued on June 6, 2022. A copy of the 3rd NIPA is annexed hereto as **Attachment D**. Alarmingly, in the 3rd NIPA, Agency Staff expressly stated, with emphasis, that "based on potential noise impacts alone, absent revisions to the project proposal, the project *does not meet the criteria for issuance of a permit under Agency law.*" (*See* Attachment D, p.4.).

First, as a matter of law, Agency Staff lacks the power to decide whether a permit application should be granted or denied. Agency Staff's duty is to review the project application and determine when it is complete and, if appropriate, provide recommendations to the regulatory

committee based on a complete application. Second, Agency Staff made this conclusion before it had even deemed the application complete for review. In contradictory fashion, Agency Staff asserted its disapproval of the project while at the same time taking the position that UCI had not provided enough information to have the application ready for review. Notably, Agency Staff offered no reasoned basis for its conclusion that the "potential noise impacts alone" warrant a denial of the application.

Agency Staff's adverse perception of the project suggested what UCI has long suspected—that Agency Staff has a predisposition toward the proposed ballistic testing that it will produce noise that will cause unacceptable adverse impacts on the environment and neighboring properties. With the issuance of the 3rd NIPA, UCI became increasingly concerned that Agency Staff tended to notice only certain aspects of the project while ignoring other details (details that support approval of the project application) or that Agency Staff did not fully comprehend the science of sound and sound acoustics being presented and relied upon by UCI. In effect, Agency Staff was capriciously and arbitrarily disregarding information provided by UCI, or drawing conclusions divorced from both science and reality.

In response to Agency Staff's inappropriate and premature finding, UCI replied "[t]here is no basis at this stage of the application process for Agency Staff to come to the underscored conclusion that the project does not meet the criteria for issuance of a permit 'based on the potential noise impacts alone' or otherwise. It is apparent from the Third Notice of Incomplete Application that Agency Staff members, themselves, believe more information is needed to properly review and assess UCI's project application. The precipitous conclusion that the application will be denied is a cause for concern that Agency Staff may be straying from the rational and logical model of decision making embodied in Agency regulations to a predisposed decision-making model

where decisions are made based on personal preferences and opinions regardless of the data and whether or not the decision is actually right." (*See* UCI's Response to 3rd NIPA).

In line with Agency Staff's expressed disposition, Agency Staff once again disagreed with UCI's estimation of the sound pressure level for the noise source in the 3rd NIPA. No rationale was provided for this disagreement. In spite of UCI supplying external documents recognized by qualified engineers and scientists supporting the sound pressure level estimations, Agency Staff provided no coherent reason for its rejection of UCI's estimations. Agency Staff again requested a revised sound assessment and noise mitigation plan. (*See* Attachment D, Comment 2.)

On February 28, 2023, UCI supplied responsive documents to the 3rd NIPA (hereinafter referred to as "UCI's Response to 3rd NIPA"). Included in UCI's response was a sound study prepared by H2H Geoscience Engineering, PLLC (hereinafter referred to as "H2H") in accordance with the requirements set forth by Agency Staff and the DEC. H2H is a recognized and respected engineering firm that has regularly presented information to the Agency and other State agencies and has extensive scientific and technical expertise in the science of sound, well in excess of that residing within the Agency. Agency Staff nonetheless was provided the opportunity to review and accept the proposed test plan prepared by H2H. Agency Staff, with minor and irrelevant modifications, approved this plan prior to its implementation. H2H then conducted sound level monitoring on December 20, 2022, and December 21, 2022, at five Agency-approved sound level monitoring locations surrounding the project site to best determine ambient sound level conditions in the area.

H2H's February 2023 Sound Study determined the modeled impulse sound level produced by two test shots per day from the Sound Source (M109, 155mm Field Howitzer) would produce a modeled change in ambient sound level below 3 dB at monitoring locations M-1, M-2, M-3, and

M-4, indicating no appreciable change to ambient sound levels at all identity residential receptors. There were no appreciable changes to the ambient sound levels at four of the five State Land parcels classified as Wild Forest. (*See* February 2023 Sound Study, p. 8). Receptor R-43 in State Wild Forest land, which has no identified public trails or other means of public access and is adjacent to the firing pad, showed a modeled impulse sound level of 107 dB(a). (*See id.*). H2H noted this is 26 dB less than the 133 dB limit for rock mining air blasts measured at the closest structure outside permitted areas that applies to the nearby mining operations during blasting, which are adjacent to lands classified as Wilderness – the most protected and restrictive State land classification. (*See id.*, p. 10). In its February 2023 report, H2H concluded "the proposed project does not pose a potentially significant environmental impact due to an increase in sound levels at receptors in the area." (*See id.*). Agency Staff offered no recognized studies nor technical papers accepted by the science and engineering communities to challenge H2H's conclusion.

Fourth Notice of Incomplete Permit Application

Agency Staff's *Fourth Notice of Incomplete Permit Application* (hereinafter referred to as the "4th NIPA") was issued on March 16, 2023. A copy of the 4th NIPA is annexed hereto as **Attachment E**. Agency Staff again disagreed with UCI's supplied documents and calculations and irrationally, and without explanation, characterized H2H's February 2023 sound study as "unacceptable." (*See* Attachment E, Comment 2). At this juncture, UCI and its project team determined that Agency Staff was requesting immaterial information or repeating its numerous requests for pertinent information simply to make more requests and perhaps prolong the application process, or Agency Staff was making such requests because it did not comprehend the science and did not know what questions to ask.

On July 31, 2023, UCI submitted responsive documents to the 4th NIPA (hereinafter referred to as "UCI's Response to 4th NIPA"). UCI noted that there was a transcription error in H2H's report concerning sound power levels between dB and dB(A) and further explained how the Norwegian Defense Research Establishments study is one of the only detailed sources of information available concerning sound pressure levels from howitzers. (*See* UCI's Response to 4th NIPA, p. 4).

On August 16, 2023, by letter, Agency Staff requested further information concerning noise mitigation measures and sound pressure level calculations. A copy of this letter is annexed hereto as **Attachment F**. On December 15, 2023, UCI submitted responsive documents (hereinafter referred to as "UCI's Second Supplemental Response"). UCI's Second Supplemental Response contained H2H's September 2023 Sound Study.

Although further noise mitigation efforts were not and are not necessary, as explained to Agency Staff by UCI in prior submissions, UCI proposed installation of a semi-permanent 13-feet tall berm along the firing pad and provided H2H's revised sound study to include the effect of the mitigation feature on sound levels at the receptors. (*See* UCI's Second Supplemental Response, p. 1, H2H's September 2023 Sound Study). The purpose of the implementation of a berm in the project design was simply to appease Agency Staff. Agency Staff continued to demand more mitigation without specifying why or the objective. In effect, Agency Staff demanded a burdensome task of making the berm higher without ever stating why or how high, creating a situation where no answer would ever be acceptable, seemingly designed to extend the application process, to delay final review and discourage further action by UCI.

Notwithstanding the foregoing, the modeled change in ambient sound levels at all identified residential receptors (M-1, M-2, M-3 and M-4) with the sound mitigation berm are

below 3 dB(A). (*See* September 2023 Sound Study, pp. 9-10). There were no appreciable changes to the ambient sound levels at four of the five State Land parcels identified as Wild Forest. (*See* September 2023 Sound Study, pp. 9-10). Receptor M-5 at parcel R-45 (State Land identified as Wild Forest) adjacent to the firing pad showed a modeled impulse sound level of 100 dB(A) with the sound mitigation berm. (*See id.*). Based on the information presented in the report, H2H again concluded "the proposed project does not pose a potentially significant environmental impact due to an increase in sound levels at receptors in the area." (*See id.*, p. 12).

UCI also explained in its supplemental response that temperature and humidity create minimal fluctuations on modeled sound levels at the receptors. UCI included a table prepared by H2H which evaluated five different weather condition testing scenarios: the lowest being 41°F at 0% humidity and the highest being 95°F at 95% humidity. Based on the evaluations, 3 dB(A) is the greatest sound pressure variance. The average weather conditions of 68°F at 70% humidity was, thus, used in the Sound Study. (*See* UCI's Second Supplemental Response, pp. 1-2). UCI further explained in the supplemental response, using H2H tables and calculations, how the data supplied was uncorrected and provides worst-case scenario results. UCI also clarified to Agency Staff the DEC Mine Land Reclamation Permit dB pressure level requirements. (*See id.*, pp. 2-6).

On January 2, 2024, Agency Staff issued the *Fifth Notice of Incomplete Permit Application* (hereinafter referred to as the "5th NIPA"). A copy of the 5th NIPA is annexed hereto as **Attachment G**.

ANALYSIS

Below, those portions labeled "Comment" are taken directly from the 5th NIPA (Attachment G). The "Objection" that follows each Comment provides justification for the Agency Board to render a determination that the particular Comment is unnecessary and no response is needed.

A. Comment No. 1 (p. 2):

- Comment: The provided materials include a revised sound study prepared by H2H Geoscience Engineering PLLC (referred to herein as the Revised Noise Analysis). The noise modeling included in the Revised Noise Analysis utilizes receptor distance measurements from the proposed gravel pad, but does not clarify which portion of the 100-foot by 100-foot pad the measurements are made from, e.g. at the nearest edge or corner of the gravel pad, the center, or the furthest edge. Varying the location of the howitzer assembly on the gravel pad and the corresponding receptor distance could result in a discrepancy of 141-feet (hypotenuse of pad), which could skew or reduce the estimated sound pressure level in inverse proportion to the square of the distance or 6 dB at 100 feet. As stated in UCI's February 28, 2023, response to the Agency's Third NIPA, '...the specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time.'

  Objection: **With this comment, Agency Staff ignores previously submitted information and things and wrongfully concludes more information is needed. As put forth in previous submissions, the 155 mm howitzer barrel assembly will be located in the center of the 100-foot by 100-foot firing pad. The center of the 100-foot by 100-foot firing pad was used as the sound source in the sound propagation model. However, moving the sound source to the end of the gravel pad (a maximum of 70 feet toward a receptor) has negligible effects on the projected sound level due to the distance from the sound source to each monitoring location.**

- Comment: Please provide cross-section sheet(s) depicting the proposed typical M109 155 mm howitzer and assembly set up to be utilized on site, including all proposed instrumentation and test articles, that is drawn to scale and depicts howitzer barrel and assembly dimensions and muzzle location. Please label the location of the noise source and its associated sound pressure level source height as measured from the finished grade of the pad."

  Objection: **This request is redundant as UCI has provided the information sought in response to previous NIPAs. For example, UCI has already provided information concerning the height of the sound source, on page 8 of Appendix D to H2H's September 2023 Sound Study. This Study specifies "a Sound Source height of 6.5 feet." Additionally, the request, in part, seeks irrelevant or immaterial information. The sound created by the firing of a howitzer has been established by UCI. A depiction of a 155 mm howitzer and assembly dimensions of its barrel do not need to be known to consider and accept UCI's sound studies. UCI and its Project Team do not understand how having cross-section sheets depicting a "typical howitzer and assembly set up" will assist Agency Staff and the Agency Board in reviewing the application. Again, UCI has repeatedly provided the location of the sound source. The timing of this**

request is also troubling. This application has been pending for years. Agency Staff never requested such information about howitzers. Notwithstanding the foregoing, the information Agency Staff seeks regarding the instrumentation and test articles to be used and the howitzer assembly is information proprietary to UCI as well as sensitive national security information which UCI is not at liberty to release. This had been made known to Agency Staff in previous discussions. Agency Staff noted that they could not protect sensitive information and, therefore, it should not be provided.

Comment: To allow for review of worst-case scenario noise impacts, please provide scaled cross-section plan sheet(s) depicting the distance between the closest point of the proposed gravel pad or the noise source, whichever is closer, to each of M1-M5, and between the closest point of the proposed gravel pad and the receptor located at the southwest corner of the nearest state land parcel. Please depict the proposed berm on each of these plan sheets.

Objection: **For the first time, Agency Staff is requesting cross-section plan sheets requiring measurements from five (5) different locations on the firing pad in relation to each receptor. UCI has said over and over again that the sound source (*i.e.*, the howitzer) will be placed in the center of the firing pad. It will not be placed on different locations of the firing pad. Nonetheless, such requested documents, if supplied, would provide negligible new information for Staff Agency to consider. The studies and science UCI has already provided to Agency Staff demonstrate this.**

Without waiving this objection, to demonstrate the negligible effect the location of the sound source on the firing pad has on calculated sound levels at receptors, please see Tables 1 and 2 below reflecting sound pressure levels as calculated from the center and edge (70 feet closer to source) of the firing pad using the following formula (previously used in UCI's Second Supplemental Response):

$$L_p = L_W - \left|10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)\right|$$

Lp = Sound Pressure Level
Lw = Sound Power level = 163.2 dB(A) (barrel of the M109, 155mm howitzer)
Q = Directivity factor = 2 (Hemispherical Sound Propagation)
r = Distance to source (meters)

Table 1: Sound Source Center of Firing Pad

Calculated Sound Pressure Level at Monitoring Locations

Monitoring Location	Distance From center of grave pad to Monitoring Location (ft.)	Calculated Sound Pressure Level dB(A)
M-1	5,955	90.0
M-2	9,925	85.6
M-3	7,726	87.8
M-4	4,908	91.7
M-5	554	110.7
State Land Corner	350	114.7

Table 2: Sound Source Edge of Firing Pad

Calculated Sound Pressure Level at Monitoring Locations

Monitoring Location	Distance From Closest Edge of gravel pad to Monitoring Location (ft.)	Calculated Sound Pressure Level dB(A)
M-1	5,905	90.1
M-2	9,875	85.6
M-3	7,676	87.8
M-4	4,858	91.8
M-5	504	111.5
State Land Corner	400	113.5

Based on the above, moving the sound source 70 feet to the edge of the firing pad has a maximum increase of 1.2 dB(A) at the Wild Forest Property Corner, 0.8 dB(A) at M-5, and less than 0.1 dB(A) at the remaining monitoring locations. Thus, moving the sound source to the edge of the firing pad "to provide a worst-case scenario," does not have a significant effect on results and producing a revised study is trivial.

Finally, the location of the proposed sound mitigation berm is shown on Figure 2 of H2H's September 2023 Sound Study and the height of said berm is 13 feet as indicated on page 8 of the same study. The information requested was previously provided. A request for the information again will not lead to a different response.

B. Comment No. 2 (p. 2):

- Comment: Please clarify what materials the berm will be constructed with, and any associated stabilization measures and other erosion and sediment controls.

  Objection: The proposal for providing a berm to mitigate noise was only provided to appease Agency Staff and is proposed without technical necessity or requirement. Lacking specific technical criteria, this question cannot be

answered. Pending the APA providing specific technical data this question is considered irrelevant.

C. Comment No. 3 (p. 2):

- Comment: Please provide an evaluation of other potential noise mitigation measures, including enclosures and/or silencers ([S]challdampfer). Please explain why none of these other noise mitigation measures are included as part of the proposal.

  Objection: **Agency Staff is effectively dictating the design of the project; a design in which UCI has no intention of adopting. Firing of the 155 mm howitzer assembly within an enclosed structure defeats the purpose of testing the equipment in simulated real-use conditions. Furthermore, installation of a silencer is not only cost prohibitive, but such modification will render test results unusable. Agency Staff's request suggests that Agency Staff does not understand the objective of the ballistic testing UCI intends to conduct, which UCI has repeatedly stated in the application and the applicable responses to the first four NIPAs.**

  Agency Staff is also directing an open-ended unanswerable challenge, that being more mitigation, yet will not identify how much more mitigation is needed or when there is enough, nor explain the reasons why more mitigation is needed. Agency Staff has consistently refused to provide any boundaries to its requirements and repeatedly demonstrated its lack of understanding of the underlying science. In one interaction, an Agency Staff member (reputed to be a technical expert) demonstrated their lack of understanding by attempting to compare the impulse noise of the howitzer with the takeoff noise associated with an F-35 aircraft. When an attempt was made to explain that these were two different and unrelated issues, the Staff member treated the response with contempt and blithely moved on to another topic.

  Furthermore, mitigation measures currently proposed include the remote location of the site, the natural topographic rise between the sound source and all residential receptors, and the construction of a sound mitigation berm. No additional mitigative measures are proposed nor are necessary due to the findings on page 12 of H2H's September 2023 Sound Study wherein "the proposed project does not pose a potential significant environmental impact due to an increase in sound levels at receptors in the area." Agency Staff is making a bald assumption that additional mitigation measures are needed without explanation and fails to realize UCI has already met all regulatory requirements. There is no need to implement additional mitigation measures to achieve already extant standards.

D. Comment No. 4 (pp. 2-3):

- **Comment**: Please explain why there are separate tables, calculations and conclusions made in the UCI written response received on December 7, 2023, that are not included in the Revised Noise Analysis. For example, as indicated in the [sic] Appendix D, Model Data, the noise analysis model input of atmospheric absorption utilizes 20°C (68°F), and 70% humidity, and does not include an evaluation of varying weather conditions. However, UCI's written response does include information on varying weather conditions and provides separate tables, including Table 1 that references the modeled sound levels and states that 'testing is not anticipated to take place under these conditions' referencing temperature 41°F/humidity 0%. Another example of this discrepancy is that the UCI response states "(T)he modeled sound pressure level is 130 dB/107 dB(A) at M-5, and 132 dB and 111 dB(A) at State Land classified as Wild Forest property corner;" however this is not discussed or presented in the Revised Noise Analysis. In addition, the UCI response section references the July 2023 Sound Study and not the Revised Noise Analysis.

  Objection: This is a redundant request. UCI has already provided information to Agency Staff on this matter (*see* UCI's Second Supplemental Response). The information is not included in the September 2023 Sound Study because the analysis in UCI's Second Supplemental Response demonstrates that temperature and humidity do not make a significant impact on results and do not change the study's findings. The July 2023 Sound Study is referenced in the written response only to indicate where information requested by Agency Staff had already been provided.

E. Comment No. 5 (p. 3):

- **Comment**: If testing will not be performed in late fall, winter, or spring conditions when the temperature of 41°F/humidity 0% scenario is a seasonal possibility, please explain why the Revised Noise Analysis included noise monitoring conducted on December 21 and 22, 2022, but model inputs included summer conditions of 20°C (68°F), and 70% humidity.

  Objection: Ambient sound monitoring was conducted December of 2022 to avoid delaying the ambient sound study until spring of 2023. Ambient sound levels will be lower during winter months due to the absence of insects and less animal activity. Snow further dampens sound attenuation. Thus, the ambient sound levels collected during December provide a conservative ambient sound assessment for the tests. Using these more conservative ambient sound levels with modeled summer conditions for the sound study results in more pronounced sound levels in "worst-case" scenario conditions since ambient sound levels will be higher in the summer.

- **Comment:** Please clarify the proposed months of operation and any other proposed atmospheric operating restrictions.

Objection: **Asked and answered. UCI has already provided this information to Agency Staff. Agency Staff's request is attempting to unlawfully dictate the design of the project. Testing will occur year-round to simulate real-use scenarios and conditions. In UCI's Second Supplemental Response, UCI stated that "testing is not anticipated to take place" (emphasis added) when temperatures are 41°F with 0% humidity; however testing could occur. Whether or not a test may occur in specific atmospheric conditions is highly dependent on the parameters of the specific experiment to be undertaken. Thus, UCI is unable to provide Agency Staff with any further proposed testing parameters beyond the information already submitted.**

- **Comment**: Additionally, application materials previously stated that there would be a maximum of two shots fired per day fired for a maximum of three consecutive days, with an average of 30 shots per year, and that shots would occur for a period of five years. The UCI Response received December 15, 2023, states that testing was not anticipated to take place at conditions of 41 degrees Fahrenheit and 0% humidity, and that conditions in the first column of Table 1 are typical for the project site during summer months. Please provide the proposed maximum number of firings per week, month, and year of the testing period.

  Objection: Agency Staff's request is attempting to unlawfully design the project. The nature of the testing and design of experiments make it impossible to predict months in advance the exact day, week or month when a shot may be fired. As included in prior submissions, the average number shots in a year will be 30; the anticipated maximum number of shots per month will be 10; firings will not occur on weekends, holidays or between the hours of 4:00pm and 10:00am. UCI will provide neighbors and local officials with a minimum seven (7) day advanced notice of any testing. Any other schedule will prevent UCI from effectively operating the tests to conduct research.

F. **Comment No. 6 (p. 3)**:

- **Comment**: Please revise Image 1 to depict the location of the 100-foot by 100-foot pad, all state land boundaries, the southwest corner of the nearest state land parcel located approximately 300 feet from the northeast corner of the firing pad, the nearest dwellings (including the Pulsifer residence), receptor locations M1 – M4, and the closest point of the proposed gravel pad or the noise source, whichever is closer, to each receptor.

  Objection: Asked and answered. UCI has already supplied Agency Staff with the requested information in Figure 1, "Site Overview Map," provided in H2H's September 2023 Sound Study.

G. **Comment No. 7 (pp. 3-4)**:

- **Comment**: A Norwegian study titled "Noise emission data for M109, 155 mm field howitzer", prepared by the Norwegian Defense Research Establishment (FFI),

and dated 5 December 2007 (the Norwegian study), is the only source of information included in the application providing noise level data from howitzers. This study includes a noise level of 130.5 dB measured at 803 feet from a howitzer. The Revised Noise Analysis appears to use this 130.5 dB measurement from the Norwegian study to calculate a modeled source noise level for an M109 155 mm howitzer of 180.8 dB. The Revised Noise Analysis then uses 180.8 dB to model noise levels at the M5 receptor on State land as 127 dB, and noise levels at the nearest residence as 100 dB. The Noise Analysis then determines that the 3.5-dB difference between the noise level data in the Norwegian Study and the modeled noise levels at the project site show "correlation within ISO standards."

Objection: Asked and answered. Agency Staff is mischaracterizing or misrepresenting data supplied by UCI in prior responses, as well as conflating sound pressure levels measured in dB as falsely equivalent with dB(A). As previously explained, the human ear is not equally sensitive to sounds of all frequencies. Human hearing is much more sensitive to medium pitches (from 500 Hz to 4,000 Hz) than to very low or very high pitches. A tone measuring 80 dB at 500 Hz (medium pitch) sounds louder to humans than a tone measuring 80 dB at 200 HZ (low pitch). To adjust measured sound pressure levels to mimic human hearing response a frequency weighting is applied to measured/calculated sound pressure levels. A-weighting is the standard frequency weighting used in environmental sound assessments. A-weighting attenuates sound with frequencies below 1000 Hz and above 4000 Hz while amplifying sound between 1000 Hz and 4000 Hz where the human ear is most sensitive.

In prior discussions this issue was raised by UCI and explained to Agency Staff. Unfortunately, Agency Staff fails to understand these nuances, nor even the grosser points of sound propagation and energy transfer. Agency Staff stated these issues were irrelevant and to "follow DEC guidelines" which they acknowledged on several occasions they did not understand in the entirety.

Agency Staff is choosing to focus on sound pressure levels without A-weighting which is misleading when referencing measured/calculated sound pressure levels at receptors. Agency Staff has directed UCI to review and provide a noise impact study based upon the DEC's *Program Policy for Assessing and Mitigating Noise Impacts*. According to this policy "noise is likely to be a matter of concern to residents or users of adjacent lands." (*See* p. 2 "II. Background") (Emphasis added.) Only when "a sound level evaluation indicates that receptors may experience sound levels or characteristics that produce significant noise impacts or impairment of property use" will the DEC require mitigation measures. (*See* p. 4, "III. Policy") (Emphasis added.) Crucially, the noise analysis shall be prepared using an A-weighted decibel scale to determine the "environmental effects of sound and human perceptions of sound." (*See* p. 7, "V. Procedure") (Emphasis added.) Thus, analysis of sound pressure levels from the proposed project should be based upon dB(A).

Agency Staff is characterizing noise levels at the M-5 receptor on State Land as 127 dB and 100 dB at the nearest residence. This is incorrect. The modeled impulse sound pressure level at M-5 is 130 dB/107 dB(A). The modeled impulse sound pressure level at State Land classified as Wild Forest, at its relevant corner, is 132 dB and 111 dB(A). With the additional mitigative effects of the Sound Mitigation Bern, the sound pressure level at M-5 is 124 dB / 100 dB(A) and 127 dB / 102 dB(a) at the State Land classified as Wild Forest, at its relevant corner. The closest inhabited structure to the noise source is the Pulsifer residence (R-1), 5,200 feet to the northeast, and has a modeled impulse sound level of 101 dB / 69 dB(A) with the Sound Mitigation Berm.

Crucially, the debate herein between Agency Staff and UCI on estimated impulse sound pressure levels is for a combined noise event that will be less than 7,500 milliseconds (0.45 seconds) in length over a five-year period. *To repeat, the length of time of sound for all anticipated firings combined to occur within a five-year period will be less than 7,500 milliseconds or 7.5 seconds.*

- Comment: Please provide an explanation of these ISO standards and the asserted correlation, including a clarification of whether the ISO standards are appropriately used in this context. Please also provide any other available documentation confirming that 3.5 dB is appropriately cited as the maximum limit of error for this proposal.

  Objection: **Agency Staff is requesting UCI to explain the standards of the International Organization of Standardization (ISO). An applicant's role is not to educate Agency Staff on the scientific or analytical standards Agency Staff is to employ when reviewing an application. With all due respect, it is expected, indeed, imperative that Agency Staff possess the expertise needed when evaluating a project application. Without an understanding of the standardization of the science being utilized and, in turn, reviewed, Agency Staff cannot be relied upon to perform a true, accurate and legitimate review of a project application.**

  Notwithstanding, Agency Staff is directed to page 6 of H2H's September 2023 Sound Study that explains International Standards Organization ISO 9613-1,2,3 standards are applied. UCI also directs Agency Staff to page 13 of the DEC's *Program Policy for Assessing and Mitigating Noise Impacts* concerning thresholds for significant sound pressure level increase. Therein, "increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive of receptors are present." (Emphasis added.) Accordingly, a sound pressure level variance of 3.5 dB has no or minimally appreciable effect on receptors.

- Comment: Please confirm through field-verification at an authorized location and through independent third party verifications that 180.8 dB is the noise level produced by M109 155 mm howitzers.

Objection: Overly burdensome, an untimely request, and seeks immaterial information. For the first time Agency Staff is requesting this test. Based on three years of Agency Staff's disputation of the asserted noise level of M109 155 mm howitzers from a respected scientific study, as well as official US Government materials, and taking into considering the effect atmospheric and environmental conditions have on sound pressure levels, any data provided by UCI from an independent test at a different locale is anticipated to be rejected by Agency Staff. Moreover, the cost to perform such a test is prohibitively high and inappropriate.

- Comment: Please note that NYSDEC's Program Policy 'Assessing and Mitigating Noise Impacts' dated October 6, 2000 last revised February 2, 2001 states that 'In determining the potential for an adverse noise impact, consider not only ambient noise levels, but also the existing land use, and whether or not an increased noise level or the introduction of a discernable sound, that is out of character with existing sounds, will be considered annoying or obtrusive.' The approximate noise level of 127 dB does not appear to be in character with the recorded ambient noise level of approximately 37.2 dBA, which per NYSDEC's noise policy, is most similar to wilderness noise levels at approximately 35 dBA.

  Objection: Agency Staff's conclusory comment fails to include or consider impulse noise levels from presently authorized noise sources. In UCI's Response to the First NIPA, UCI noted that impulse noise levels from standard hunting weapons ranges from 160 dB (12-gauge shotgun with an 18.5-inch barrel) to 164 dB (.357 Magnum). Additionally, chainsaws produce continuous noise levels between 105 dB and 120 dB. Naturally occurring lightning strikes and thunder produce an approximate noise level of 120 dB. Thus, the approximate impulse noise level of 127 dB from the proposed tests at State Land classified as Wild Forest, at its relevant corner, is 70-80 dB less than common hunting rifles and only 7 dB louder than a lightning strike (thunder). Agency Staff's current position implies that any impulse noise greater than 35 dB(A) in a wilderness area should not be allowed. If Agency Staff's view was adopted that would result in hunting with firearms being prohibited as an impulse noise source greater than acceptable wilderness ambient noise levels.

H. Comment No. 8 (p. 4):

- Comment: The 'Noise emission data for M109, 155 mm field howitzer' study referenced in the Revised Noise Analysis references a maximum charge of 5 modules DM72 with each module containing 2.44 kilograms propelling charge, while USACHPPM materials referenced in the UCI response received by the Agency July 18, 2022 reference the sound level for a M4A2 zone 7 charge. Please confirm that this will be the maximum charge used. Please also explain how the two charges compare and the effect will have on the level of sound produced.

Objection: Agency Staff is attempting to dictate the design of the project. The design Agency Staff seemingly seeks to be implemented is a design in which UCI has no intention of adopting. Agency Staff is also requesting proprietary and sensitive information UCI is not at liberty to release.

I. Comment No. 9 (p. 4):

- **Comment**: Please provide an updated noise analysis that accounts for the confirmed height of the noise source from the gravel pad and the location of the noise source at the closest point of the gravel pad to each receptor. This updated noise analysis must include all tabular, calculated, and conclusory information included in the latest UCI response, Modal Data in Appendix D, and barrier attenuation calculations that account for the most conservative/worst case scenario height and location of the noise source in relation to each receptor. The updated noise analysis must also account for all proposed months of operation and any proposed atmospheric operating restrictions. In addition, the analysis must include revised tabular information, Modal Data in Appendix D, and barrier attenuation calculations that account for the height and location of the noise source in relation to each receptor, and must include sound pressure levels expressed as both dB and dBA. This updated analysis must include a cover sheet with the seal of a NYS licensed professional engineer.

  Objection: This is an unduly burdensome and untimely request which seeks immaterial information. Agency Staff requests new information not before requested although having ample time and opportunities. Furthermore, if UCI were to comply with this request, any new information provided by such revised noise analysis will be nominal or immaterial (*see* responses to Comment 1, *supra*).

CONCLUSION

In summary, UCI has supplied to Agency Staff extensive scientific data supporting a finding that UCI's proposed project (i) will be quieter on surrounding environments than noise generated by the nearby mining operations during blasting, (ii) will create a combined impulse noise event of *7.5 seconds over a five-year period*, and (iii) does not pose a potentially significant environmental impact due to an increase in sound levels in surrounding land, including those designated Wild Forest. Furthermore, if the Agency were to adopt Agency Staff's present opinion that any impulse noise from a ballistic source near Wild Forest land above 35 dB(A) is

impermissible, such position means all hunting firearms, as an impulse noise source greater than the Agency Staff's acceptable wilderness ambient noise level, are also prohibited.

Based upon the foregoing, UCI respectfully requests that the Agency issue a determination finding that: (1) all requests for information contained in the 5th NIPA are duplicative, unnecessary or moot as all information required for the project application to be complete has been submitted by UCI; (2) certain requests for information contained in the 5th NIPA are lacking relevancy or materiality for purposes of completing the application and therefore must be stricken; (3) certain comments contained in the 5th NIPA must be stricken from the administrative record as they are based upon factual errors; (4) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to issue a *de facto* denial of the application; (5) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to alter or change the proposed project or use, contrary to the intentions of UCI or prejudicial to UCI; (6) UCI's project application is complete; and, (7) pursuant to 9 NYCRR §572.22(h), providing notice of the completeness of the application as required by law and thereafter granting the permit application.

Dated: February 29, 2024

Norfolk Beier PLLC

By: _____
Matthew D. Norfolk, Esq.
Authorized Representative

To: Chairman John Ernst
Dan Wilt, Chair – Committee on Regulatory Programs
Barbara Rice, Executive Director
Sarah Reynolds, Esq., General Counsel
David Plant, Deputy Director for Regulatory Programs

EXHIBIT E

NEW YORK STATE | Adirondack Park Agency

KATHY HOCHUL
Governor

BARBARA RICE
Executive Director

Adirondack Park Agency
DRAFT May MEETING MINUTES

Thursday, May 16, 2024

Agency Members, Designees, and Executive Staff Present:

John Ernst, Chairperson

Brad Austin, ESD
Mark Hall, Member
Art Lussi, Member
Ken Lynch, Member
Matt Tebo, Department of State
Dan Wilt, Member
Randy Young, NYS Department of Environmental Conservation

Barbara Rice, Executive Director
Damion Stodola, Counsel

Absent and Excused
Benita Law-Diao, Member
Zoë Smith, Member

Local Government Review Board Present
Gerald Delaney, Executive Director

1. CALL TO ORDER and 2. WELCOMING REMARKS

The meeting was called to order at 9:32 AM. Chairperson Ernst welcomed the public and staff. Chairperson Ernst reported that the Open Space Institute recently celebrated its 50th anniversary where it honored founders and long-time staff member.

3. PUBLIC COMMENT

Kevin Bean, Supervisor, Town of Johnsburg, read the resolution issued by the Town of Johnsburg in support of Barton Mine after a unanimous vote. The permit for this is under review by the DEC and APA.

4. APPROVAL OF APRIL 18, 2024 AGENCY MEETING MINUTES

On motion of Mark Hall, seconded by John Ernst, the April minutes were, with the amendments noted below, unanimously approved with Randy Young abstaining.

- The second sentence regarding General Permit 2024G-1 indicating that John Ernst seconded the motion was removed because that information was already captured in the first sentence.
- The start time for the Regulatory Programs Committee minutes was changed from "1:30 PM" to "9:48 AM."
- The Regulatory Programs Committee minutes were changed from "(1)P2023-0038 –Horseshoe Pond and Deer River Flow Association (Aaron Ziemann) Aaron Ziemann, Associate Adirondack Park Project Analyst Forest Resources, gave a detailed overview and presentation of the project including review of jurisdiction, conclusions of law, a description and slides of the project location and the existing conditions, site history, proposed project details, visual analysis slides, public comment, review by others, and staff's recommendation and permit conditions" to
  "(1) P2023-0038 – Application for the use of herbicide ProcellaCOR EC in Horseshoe Pond and Deer River Flow Association (Aaron Ziemann) Aaron Ziemann, Associate Adirondack Park Project Analyst Forest Resources, gave a detailed overview and presentation of the project including review of jurisdiction, conclusions of law, a description and slides of the project location and the existing conditions, site history, proposed project details, visual analysis slides, public comment, review by others, and staff's recommendation and permit conditions."

5. RECUSALS

None

6. MOTION FOR EXECUTIVE SESSION

General Counsel Damion Stodola indicated an Executive Session would be appropriate to discuss ongoing and pending litigation. On motion of John Ernst, seconded by Mark Hall, the Agency Board unanimously voted to conduct an executive session for purposes of discussing ongoing and pending litigation.

7. EXECUTIVE DIRECTOR'S REPORT

Executive Director Barbara Rice presented the Executive Director Report, highlights of which included:

- Today is bike to workday, which we are re-naming Bike to Board day. Members and staff met up on the Adirondack Rail Trail to bicycle to the agency in time for the meeting.
- Executive Director Rice expressed condolences to the family, friends, and colleagues of Ranger Robbi Mecus, of the New York State Department of Environmental Conservation who passed away last month following a climbing accident in Alaska.
- Welcomed the first of four interns, Emily Pulcini, who will be interning in the GIS division working closely with Molly Jordan. In the next few weeks, we will be adding interns to our legal, science and economic divisions.
- Congratulations to Ariel Lynch on her promotion to Environmental Program Specialist 3. Ariel has been with the agency since 2007 and has most recently been our expert on the issue of cell towers within the Park.
- Our second Adirondack Planning Forum which took place last month at the Hotel Saranac, hosted 220 local government officials, Adirondack Park citizens, consultants and partner agency representatives. Executive Director Rice thanked Gerald Delaney for bringing his community voice to the welcoming address, and now-former Secretary of State Robert Rodriquez for speaking at our reception. Executive Director Rice also acknowledged the incredible effort that went into planning and executing this year's forum particularly by our Local Government Services staff Robyn Burgess and Kate-Lyn Knight.
- Governor Hochul announced big funding wins for Adirondack communities in this year's Smart Growth Grant Program Awards. 36 Adirondack Park projects netted over $4.3 million in funding to be put toward important projects like affordable housing, climate change mitigation, green energy infrastructure and community recreation.
- We welcomed students from Allendale Columbia School in Rochester and North Country Community College to the Agency last month where they learned about the Park and how the APA protects it. Staff, particularly Dave Plante, Deputy Director of Regulatory Programs, went out of their way to provide presentations

to these groups helping the next generation develop a stronger understanding of and connection to the Adirondack Park and our Mission.

- We joined regional agencies, organizations, and business for the first time at Adirondack Day last week, Keith McKeever, Megan Phillips and Ben Brosseau spent the day connecting with legislators and citizens through the legislative office building in Albany allowing for further opportunities for outreach and sharing of our mission with those that may not have engaged with us directly in the past.
- NYS Supreme Court, Appellate Division, Third Judicial Department made a unanimous four to zero decision in favor of the agency in the Lake George ProcellaCOR case. This decision reflected the thoughtful and thorough work completed by the staff and the Board's fair and science-based decision.
- In an effort to improve transparency staff have started a website revamp. We have started to review how we share information through our website and work through challenges utilizing data and best practices to re-align our structure with the content and make it easier to find the information that landowners, communities and other audience need.

8. MOTION TO ADJOURN INTO COMMITTEES

On motion of John Ernst, seconded by Art Lussi, the Agency Board unanimously voted to adjourn to committees at 9:52 AM

State Land Committee

The committee meeting convened at approximately 9:53 AM.

State Land Committee Members Present: Ken Lynch (Chair), Randy Young (DEC) and John Ernst.

Other Members and Designees Present

Brad Austin (ESD), Art Lussi, Matt Tebo (DOS), Dan Wilt

Local Government Review Board Present

Gerald Delaney, Executive Director

Agency Staff Present

Barb Rice, Damion Stodola, Megan Phillips, Kevin Prickett

(1) Planning Division Report (Megan Phillips)

Megan Phillips, Deputy Director for Planning provided an update on recent Planning Division activities to both the state land and park policy and planning committees, highlights of which included:

- The team is very lucky to have Emily Pulcini join the GIS team an intern.
- Congratulated Local Government Services staff, Robyn Burgess, and Kate-Lyn Knight on another successful Adirondack Planning Forum. Attendees also had an opportunity to meet with the North Country Economic Development Council and the Department of State to talk about opportunities in NY Forward and DRI programs.
- 42 Variance referrals have been processed by the Local Government Services team so far in 2024 from local Agency approved land use programs. Staff process approximately 100 variance referrals a year and typically only reverse 2-4 of those.
- There is a new funding opportunity to implement options for strategies for reducing road salt use. The DECs Water Quality Improvement Grant and the Non-Agricultural Non-Point Source Planning Grant opportunities are currently open and the deadline for applications is July 31 by 4:00 PM.
- The DEC released an advanced notice on potential rulemaking to solicit feedback on an update to the State's Water Quality Standards. This is the process by which the DEC will consider setting chloride standards for the protection of aquatic life.
- Phase 2 of the Rail Trail is now closed to the public while it is under construction. Phase 3 is currently out to bid with the bid opening scheduled for May 22, construction slated to start in July.

2. Cranberry Lake Campground Unit Management Plan Amendment (Oliver Miller, DEC, and Kevin Prickett, APA)

   Oliver Miller, Environmental Protection Specialist 1 at the NYS Department of Environmental Conservation presented the proposed plan for a draft amendment to the Unit Management Plan for the campground at Cranberry Lake to allow for the creation of a playground in space previously occupied by an amphitheater. Staff highlighted the multiple options for surfacing and location that were considered for the project.

   Kevin Prickett, Environmental Protection Specialist 2, shared applicable guidelines from the State Land Master Plan for this project, specifically those for intensive use areas and public campgrounds.

On a motion of John Ernst, seconded by Randy Young, the committee unanimously recommended this project be authorized for a joint comment period with DEC.

Old Business

None

New Business

None

Committee Adjourned at 10:27 AM

Park Policy & Planning Committee
The committee meeting convened at approximately 10:28 AM.

Park Policy & Planning Committee Members Present: John Ernst (stepping in for Chair, Benita Law-Diao), Mark Hall and Brad Austin (ESD)

Other Members and Designees Present

Art Lussi, Ken Lynch, Matt Tebo (DOS), Dan Wilt, Randy Young

Local Government Review Board Present

Gerald Delaney, Executive Director

Agency Staff Present

Barb Rice, Damion Stodola, Megan Phillips, Kevin Prickett

1. Housing in the Adirondacks
   Beth Gilles, Executive Director of Lake Champlain-Lake George Regional Planning Board and Crystal Loffler from the NYS Office of Homes and Community Renewal provided presentations of their work to assess housing needs within the region and grant programs available to provide funding in support of mitigating the existing housing shortages.

Old Business

None

New Business

None

Committee Adjourned at 11:34 AM

Executive Session/Lunch

Because no action was taken, no minutes of the executive session were required or taken.

Regulatory Programs Committee

The committee meeting convened at approximately 1:05 PM.

Regulatory Programs Committee Members Present:

Dan Wilt (Chair), Art Lussi, Ken Lynch, Matt Tebo (DOS)

Other Members and Designees Present:

Brad Austin (ESD), John Ernst, Mark Hall, Randy Young

Local Government Review Board

Gerald Delaney, Executive Director

Agency Staff Present:

Sarah Reynolds, Barb Rice, Damion Stodola, David Plante, Aaron Ziemann, John Burth

(1) Regulatory Programs Division Report (David Plante)

David Plante, Deputy Director of Regulatory Programs and Enforcement provided an update on recent Regulatory Programs activities, highlights of which included:

- As of April 30, 2024, 148 applications have been received which is an increase as compared to this time in 2024 by 44 applications.
- 73 permits have been issued which is less than the 82 issued in 2023 during the same time frame.
- 23 Major Projects have been deemed complete and submitted to the Environmental Notice Bulletin for public comment, which is on par with the 27 completion projects at this time in 2023.
- Lastly, 3 emergency permits/emergency recovery authorizations have been issued thus far in 2024.
- The application form for Commercial Solar Generation Facilities has been updated to include a checkbox for the landowner to allow us to track invasive species on their property and report infestations to iMapInvasives, requirements for additional information related to decommissioning, operations & maintenance plans, battery storage components (if applicable) and requirements for additional

threatened/endangered species and historic resources consultations, as well as a reference to the updated solar project section of the Development in the Adirondack Park (DAP) guidance document. The newly completed form has been uploaded to the Agency website for ease of access by the public.

(2) P2021-0276 – Michael Hopmeier, NIPA Appeal

Dan Wilt, as Chair of the Regulatory Programs Committee, called to order an appeal, pursuant to APA Regulation 572.22, asking the Committee to recommend to the full Board that it reject an action taken by Deputy Director of Regulatory Programs, David Plante, seeking additional information to review the permit application.

Chair Wilt identified the representatives, the time limits for their arguments, and indicated that he would then allow the full Board to ask questions of the representatives.

Matthew Norfolk, of Norfolk Beier PLLC represented the applicant and appellant in this matter, Michael Hopmeier of Unconventional Concepts, Inc. Sarah Reynolds, Associate Counsel for the APA, represented David Plante and his determination in issuing the Fifth Notice of Incompletely Permit Application.

Following the presentations, Chair Wilt opened the floor for questions.

Dan Wilt clarified that the appeal is separate from and did not require a decision on the applicant's permit as it was still not complete. The Agency will make a decision on the permit only after all preliminary steps have been completed. The only matter before the Committee today is the appeal of the Deputy Director's fifth notice of incomplete permit application.
Brad Austin, Randy Young, and Ken Lynch respectively asked questions concerning staff expertise and the agency's ability to hire outside experts; clarifications of the size of the charge used in the testing; and the number of shots proposed to be made in the application. Both Sarah Reynolds and Matthew Norfolk provided answers.
After a final call for questions and hearing none, on motion of Ken Lynch, seconded by Art Lussi, the Regulatory Programs Committee voted unanimously to recommend that the Board deny the appeal.

(3) P20220218 – USL Marina, LLC Permit for expansion of existing marina through installation of a new dock system on Fish Creek Pond.
John Burth, Environmental Program Specialist 3 provided a detailed overview and presentation of the permit application by USL Marina, LLC for expansion of the existing marina through installation of a new dock system on Fish Creek Pond. The presentation included a review of the jurisdiction, conclusions of law, a description of slides of the project location, existing condition, site history, proposed project details,

visual analysis slides, public comment, review by others, and staff recommendations and permit conditions.

On motion of Art Lussi, seconded by Matt Tebo, the committee unanimously recommended the approval of the applications with conditions to the Full Agency Board.

(4) P2024-0040 – Permit for application of herbicide ProcellaCOR EC within four treatment zones in East and West Caroga Lakes, to control Eurasian watermilfoil. Aaron Ziemann, Associate Adirondack Park Project Analyst – Forest Resources, gave a detailed overview and presentation of the application for the use of the herbicide ProcellaCOR EC within four treatment zones in East and West Caroga Lakes to control Eurasian watermilfoil, including review of jurisdiction, conclusions of law, a description and slides of the project location and existing conditions, site history, proposed project details, visual analysis slides, public comment, review by others, and staff's recommendations and permit conditions.

On motion of Art Lussi, and seconded by Ken Lynch, the committee unanimously voted to recommend the approval of the application to the Full Agency Board.

Old Business

None

New Business

None

The Board returned to Full Agency at 3:19 PM

9. Committee Reports

a) State Land Committee

The State Land Committee reported that they heard a presentation from DEC and APA staff recommending that a project at the Cranberry Lake DEC Campground which would require an amendment to the UMP for the construction of a playground. On the motion of Ken Lynch, and seconded by John Ernst, the committee unanimously voted to move this project forward toa period of public comment.

b) Park Policy and Planning

The Park Policy and Planning Committee reported that they received a presentation from the Lake Champlain-Lake George Regional Planning Board and the New York State Office of Homes and Community Renewal highlighting their work to assess housing needs within the region as well as grant opportunities that exist within the state for municipalities to help fund housing creation and rehabilitation of existing homes.

c) Regulatory Programs Committee

Chair Wilt reported that the Regulatory Programs Committee recommended the following actions to the full Board.

P2021-0276 – NIPA appeal. On the motion of Dan Wilt, and seconded Matt Tebo, the Board unanimously denied the applicant's appeal from Deputy Director David Plant's Fifth Notice of Incomplete Permit Application.

P2022-0218 – On the motion of Dan Wilt, and seconded by Art Lussi, the Board voted unanimously to approve this permit application from USL Marina for an expansion of the existing marina and new dock system with the noted conditions.

P2024-0040 –On the motion of Dan Wilt, seconded by John Ernst, the Board voted unanimously to approve this permit for application of the herbicide ProcellaCOR EC to locations in East and West Caroga Lakes with the noted conditions.

d) Local Government Review Board Report
Gerald Delaney APA staff that found the before and after ProcellaCOR video of Lake Luzerne that showed the efficacy of the herbicide on Eurasian watermilfoil.

10. Interim Reports

The Administration, Economic Affairs, Enforcement, Legal Affairs, Local Government Services, Park Ecology and Public Awareness committees did not meet this month.

11. Member Comment

None

12. Old Business

None

13. New Business

None

14. Public Comment

Chris Navitsky, Lake George Water Keeper, presented a statement to the Board in opposition of the use of ProcellaCOR EC for use in Lake George citing recent findings of the Minnesota Department of Agriculture which defined a degraded version of the active ingredient as a PFAS or “forever chemical.”

Claudia Braymer, Protect the Adirondacks!, expressed confusion regarding the jurisdictional threshold of a wetlands review as noted in the presentation for the expansion of the USL Marina on Fish Creek Pond. She also expressed her desire for an adjudicatory hearing on the use of ProcellaCOR.

James Monty spoke in support of the project in Lewis, NY being proposed by Michael Hopmeier/Unconventional Concepts, Inc. and criticized the APA for denying the permit. Damion Stodola, General Counsel, clarified for the commentator that the appeal that was heard today was not a determination of the merits of the permit, which remained incomplete. It was an appeal of a fifth Notice of Incomplete Permit Application (NIPA). The project itself has not been and cannot be decided upon until a complete application is received.

Shaun Gilliland, Supervisor of the Town of Willsboro and Essex County Board of Supervisors Chair also spoke in support of the project being proposed by Michael Hopmeier/Unconventional Concepts, Inc. and its importance for the safety of members of the armed forces.

Helena Rice spoke in objection to the use of ProcellaCOR on Lake George, specifically the area known as Sheep’s Meadow Bay.

[Link to video and audio recordings of the full Agency presentation to be added.]

Chairperson Ernst said that the next meeting will be June 20-21, 2024.

The meeting was adjourned without objection at approximately 4:08 pm.

_____

John Ernst, Chairperson

EXHIBIT F

NEW YORK STATE ADIRONDACK PARK AGENCY

In the Matter of APA Project No. 2021-0276,
Commercial Use – Ballistics Testing Facility
Project Sponsor: Michael Hopmeier of Unconventional Concepts, Inc.

REPLY MEMORANDUM IN SUPPORT OF PROJECT SPONSOR'S APPEAL OF FIFTH NOTICE OF INCOMPLETE APPLICATION

Please take notice that, pursuant to 9 NYCRR §572.22(a), Project Sponsor Michael Hopmeier of Unconventional Concepts, Inc. (hereinafter referred to as "UCI") submits this reply memorandum in support of its appeal of *Fifth Notice of Incomplete Application*, dated January 2, 2024 (hereinafter referred to as the 5th NIPA), an action taken by David J. Plante, Deputy Director of Regulatory Programs of New York State Adirondack Park Agency; and

Please take further notice that this appeal is being filed on behalf of UCI by the law firm of Norfolk Beier PLLC, with Matthew D. Norfolk, Esq. being of counsel, UCI's Authorized Representative herein.

Please take further notice that this appeal seeks a determination finding that: (1) all requests for information contained in the 5th NIPA are duplicative, unnecessary or moot as all information required for the project application to be complete has been submitted by UCI; (2) certain requests for information contained in the 5th NIPA are lacking relevancy to attaining a determination of application completion; (3) certain comments contained in the 5th NIPA must be stricken from the administrative record as they are based upon factual errors; (4) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to issue a *de facto* denial of the application; (5) certain comments contained in the 5th NIPA must be stricken from the administrative record as they were made by Agency Staff in an unlawful attempt to alter or change the proposed project or use,

contrary to the intentions of UCI or prejudicial to UCI; (6) UCI's project application is complete; and, (7) pursuant to 9 NYCRR §572.22(h), providing notice of the completeness of the application as required by law and thereafter granting the permit application.

DECONSTRUCTING AGENCY STAFF'S OPPOSITION

Agency Staff's opposition memorandum, in large part, supports UCI's appeal and demonstrates the redundancy and arbitrary and capricious nature of the questions in its 5th NIPA. Agency Staff's responses to UCI's objections to each question contained in the 5th NIPA are discussed below, starting with Questions 3 and 5, which Agency Staff now deem to be fully answered.[1]

Question 3 of the 5th NIPA

Now, on appeal, Agency Staff deems Question 3 to be satisfactorily answered and no further response needed. Yet, no new information was provided by UCI in its initial appeal papers. UCI put forth its objections and merely stated no additional mitigation is needed, while pointing to its past submissions for support (*see* 1st NIPA response; p.5; 2nd NIPA response, p.4; Addendum to UCI's 2nd NIPA response, pp. 4-6; 3rd NIPA response, 6th p.; 4th NIPA response, p. 5; *see also* H2H Geoscience Engineering, PLLC September 2023 Sound Study submitted, p. 12 (September 2023). This is a prime example of Agency Staff's practice throughout the permit application process – requesting information previously provided.

[1] In its initial appeal papers, UCI collectively refers to Agency Staff's enumerated comments/questions contained in the NIPAs as "Comments." In opposition to UCI's appeal, Agency Staff refers to them as "Questions." To avoid confusion, herein UCI will also collectively refer to the enumerated comments/questions contained in the NIPAs as "Questions."

Question 5 of the 5th NIPA

Similar to how it responded to Question 3 on appeal, Agency Staff deems Question 5 to be satisfactorily answered and no further response needed. Quite telling, it concedes that UCI already answered the question. In its opposition, Agency Staff expressly states it was looking only for "*confirmation*" of an earlier response. Specifically, Agency Staff states in its opposition memorandum, at p. 14:

> **Question 5 of the fifth NIPA requested *confirmation* of the proposed maximum number of shots per week, month, and year, and whether there were any atmospheric conditions under which testing would not occur. The applicant responded to this question on pages 16-17 of the appeal, *confirming* that testing is proposed to occur year-round, with a maximum of 10 shots per month, and with no atmospheric restrictions.** [Emphasis added.]

UCI should not be required to confirm that which it already stated and submitted. Agency Staff has at its disposal the entire record. Additionally, Agency Staff's excuse for Question 5 is not sufficient. Applicants often change their proposed project and information associated therewith. Agency Staff is questioning the truth and veracity of UCI's submissions. This is not within the purview of Agency Staff's review of the application.

Question 1 of the 5th NIPA

The calculations and tabulations contained in UCI's objections to Question 1 provide the same information provided earlier to Agency Staff, just said in a different way, in another attempt to have Agency Staff understand the scientific data and technical information supporting the project application. To our knowledge, Agency Staff has not sought the assistance of a qualified expert for it to accurately interpret and understand information UCI has provided. This is so despite Executive Law §804 authorizing it to contract for professional and technical assistance and advice.

With respect to Agency Staff's claim that UCI has not provided the height of the sound source, this can be found on page 8 of the September 2023 Sound Study prepared by H2H Geoscience Engineering, PLLC ("H2H"). The September 2023 Sound Study was submitted to Agency Staff in response to a letter-request, dated August 16, 2023, from Mr. Fritz Aldinger, Agency Environmental Program Specialist 1. The September Sound Study, at p. 8, 1st paragraph, states, in pertinent part:

> **A receiver height of 5 feet, and *Sound Source height of 6.5 feet is used*. This field howitzer model is typical for its type and would represent the noisiest field howitzer tested on Site. The modeled scenario shows the M109A3GN firing from the Firing Pad (only location Sound Source will be operated) as shown on Figure 2. Appendix D summaries model input data.** [Emphasis added.]

It is disingenuous for Agency Staff to argue that the sound source height was not provided nor "used in noise analysis." (*See* Agency Staff Memorandum, p. 15, 1st ¶.) Again. it is not the applicant's responsibility to direct Agency Staff to a particular part of the record to see information already provided.

Turning to Agency Staff's claim that UCI never provided information regarding the sound source being in the center of the 100-foot by 100-foot firing pad, this is without merit. At the in-person meeting with Agency Staff on July 25, 2022, Mr. Hopmeier explained that the howitzer, the sound source, would be in the center of the pad.

Notwithstanding the foregoing, UCI's September 2023 Sound Study prepared by H2H states that the distances from the sound source (*i.e.*, the howitzer) to the sound receptors was measured from the firing pad. In other words, the measurements were from the edge of the firing pad closest to the sound receptor. Obviously, the edge of the square 100' x 100' firing pad is closer to a sound receptor than the center of the firing pad, a distance of 50'. This is a *de minimis* difference in distance regardless what sound receptor is used in the calculation. A qualified sound

engineer would know this. Nonetheless, the edge of the firing pad closets to any particular sound receptor is a distance less than that from the center of the pad resulting in a "worse case scenario," undefined standard Agency Stuff regularly uses.

But, it bears repeating. The distance between sound receptors measured from the center of the firing pad and the edge of the pad is *de minimis*. The closest sound receptor (Monitoring Location M5) is 504' from the edge of the firing pad and 554' from the center of the pad. *See* UCI's December 2023 submission. Thus, there is only a 9.9% difference in distance. The next closest sound receptor is 5,200' away (Monitoring Location M4). *See* December 2023 submission (response to the letter-request, dated August 16, 2023, form Fritz Aldinger Environmental Program Specialist 1). There is only a .01% difference in distance using the center of the firing pad compared to the edge of the pad. The percentage of the difference in distance from the center of the firing pad and edge of the pad for the remaining three (farther away) sound receptors (Monitoring Location M1 (5,905' from firing pad edge), M2 (9,875' from firing pad edge) and M3(7,676' from firing pad edge)) is obviously less – drastically less.

If Agency Staff employed the services of a qualified sound engineer, it would have concluded that the difference in distance to the sound receptors from the center of the firing pad and edge of the firing pad is *de minimis* and should not be a reason to reject H2H's sound study and nit-pick over where the sound source may or may not be on the firing pad.

Question 2 of the 5th NIPA

UCI stated it would construct a berm. A "berm" is defined "as a mound or wall of earth or sand." Merriam-Webster Dictionary. This is common knowledge. That is what UCI's proposed berm will be constructed with. For Agency Staff to ask what materials will be used to construct a berm would cause most reasonable persons' eyes to roll.

Notably, the Agency's own rules and regulations use the term "berm." *See* 9 NYCRR 578.8(i) ("Other regulated activities may introduce or increase toxins, noise and other forms of pollution, remove or reduce vegetation or expose soil to erosion. Such activities include, for example, the operation of all-terrain vehicles and airboats, construction of utilities in existing or new corridors, either overhead or underground, disposal of chemicals, introduction or discharge of pollutants, application of pesticides and other chemicals, disposal of solid wastes, clearcutting or other timber harvesting practices, and construction or removal of groins, bulkheads, *berms* or levies."[Emphasis added.]) The term "berm" is not defined in the Agency's regulations. The drafters did not include a definition presumably because none is needed. A berm is a berm – a mound of earth or soil or sand. It is unreasonable for Agency Staff to ask UCI to "clarify what materials the berms will be constructed with."

Furthermore, Agency Staff claims no information was provided as to the location of the berm. This is wrong. UCI expressly states where the berm will be located; that is, "along the northern boundary line of the Firing Pad." *See* UCI's response December 2023. Moreover, in "Figure -2 Site Map" of UCI's September 2023 Sound Study it depicts to scale in yellow, having a dog-leg left shape, the berm wrapping around the eastern and northern boundary of the firing pad. To be candid, this is a gross oversight by Agency Staff and causes UCI to again have much concern about Agency Staff's attention to detail, knowledge of the record and competency in interpreting basic maps.

Question 6 of the 5th NIPA

Deeming a permit application to be incomplete purportedly because an image or map has illegible markings or faint colors is an unreasonable basis, tiptoeing near misuse of statutory

authority. An email or telephone call from Agency Staff to the applicant or authorized representative would have resolved the issue.

In any event, Agency Staff is asking the Agency Board to affirm the need for a "revision to "Image 1." Such affirmation is not necessary. Image 1 provided by UCI is legible and easy to interpret. Notwithstanding this, UCI shall provide a new copy of Image 1

Question 7 of the 5th NIPA

Agency Staff's request for information in Question 7 of the 5th NIPA is a result of it not having qualified and able experts well-versed in the science and study of sound, whether in-house or through third-party contracts. Agency Staff is having difficulty understanding why UCI is employing International Organization of Standardization ("ISO") standards when, according to Agency Staff, "ISO standards have not been used in relation to other recent commercial and mining projects in the Park." *See* Agency Staff memorandum, p. 18. Agency Staff is effectively conceding it has no experience with ISO standards nor the method of their application. As a consequence, Agency Staff unabashedly requests UCI to explain what ISO standards are and why they exist and how they are interpreted and applied to UCI's studies. Question 7 states, in pertinent part, "[p]lease provide an explanation these ISO standards." UCI, as an applicant, has no obligation to explain to Agency Staff what ISO standards are nor how they are applied.

Moreover, without expertise in the field of sound science, Agency Staff cannot understand the 2007 Norwegian Study nor how UCI use it to measure the sound level at the sound source location (location of the howitzer) as explained in UCI's response to the 4th NIPA and prior submissions. Years into this application, Agency Staff is still asking for *confirmation* of the noise level produced by a howitzer.

Agency Staff must be educated in some manner not involving UCI. Agency Staff should have retained and should now retain a third party expert to assist it with UCI's application and certainly have the third party expert present the application to the Agency Board. UCI fears Agency Staff will not accurately present the science and data to the Board. UCI hereby requests an expert in the field of sound present the application to the Agency Board when the time comes for the Board to take action.

The remaining requests in Question 7 ask UCI to *confirm* that the information *already provided* to Agency Staff is accurate. In other words, Agency Staff is repeating a request for information which it already possesses. UCI's response to Question 7 of the 5th NIPA is complete.

Question 8 of the 5th NIPA

Agency Staff baldly asserts that "[t]he charge used in a howitzer may significantly alter the impose noise level produced from firing. *See* Agency Staff memorandum, p. 19. Agency Staff cites no source or authority supporting its conclusion. Agency Staff should be required at oral presentation to explain how it arrived at this conclusion.

Agency Staff is obligated to accept UCI's response to the 4th NIPA where it states the charges used will not exceed the maximum sound level to be produced when the howitzer is fired. It has offered no coherent basis to reject the answer. If Agency Staff had the assistance of an audible engineer it would understand UCI's position.

Question 9 of the 5th NPIA

Agency Staff is requesting another sound study to provide a "worse case scenario," whatever that means, accounting for the height and location of the sound source. UCI has already done this with the September 2023 Sound Study. Measurements were based on the edges of the firing pad and a 6.5 feet sound source (barrel) height. Agency Staff desires UCI to state it again. A qualified audio engineer retained by Agency Staff would not have required this.

Agency Staff's Repeated Request for Engineered Stamped Data

As an initial matter, Agency Staff knows very well that the data provided by UCI has been generated by New York State licensed professional audible engineers, H2H. Moreover, to date Agency Staff has accepted all studies conducted and data offered by H2H, and based all of its NIPAs on the H2H studies and data. Agency Staff is desperately searching for something to support its 5th NIPA.

Notwithstanding the foregoing, UCI shall submit the studies and data again signed and stamped by an engineer from H2H. With this commitment, Agency Staff's request is moot.

CONCLUSION

UCI has supplied to Agency Staff extensive scientific data supporting a finding that UCI's proposed project (i) will be quieter on surrounding environments than noise generated by the nearby mining operations during blasting, (ii) will create a combined impulse noise event of *7.5 seconds over a five-year period*, and (iii) does not pose a potentially significant environmental impact due to an increase in sound levels in surrounding land, including those designated Wild Forest. Nothing more is needed from UCI. And, UCI will produce studies and data signed and stamped by a licensed professional engineer from H2H as requested. Accordingly, the application should be deemed complete, or at least so contingent on stamped studies and data.

Dated: May 15, 2024

Norfolk Beier PLLC

By: _____
Matthew D. Norfolk, Esq.
Authorized Representative

To: Chairman John Ernst
Dan Wilt, Chair – Committee on Regulatory Programs
Barbara Rice, Executive Director
Sarah Reynolds, Esq., General Counsel
David Plant, Deputy Director for Regulatory Programs

EXHIBIT G

NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency
RECEIVED
Date: June 20, 2025

New York State Adirondack Park Agency
KATHY HOCHUL
Governor
BARBARA RICE
Executive Director

FIFTH NOTICE OF INCOMPLETE PERMIT APPLICATION
APA Project No. 2021-0276

Project Sponsor:	**Authorized Representative:**
Michael Hopmeier 620 Herndon Parkway, Suite 120A Herndon, VA 20170	Matthew D. Norfolk, Esq. 1936 Saranac Ave, Suite 106 Lake Placid, NY 12946

Date Permit Application Received: November 19, 2021
Type of Project: Commercial Use – Munitions testing facility
Location of Project: Town of Lewis, Essex County
Land Use Area: Rural Use
Tax Map No.: 38.1-1-31.000 & 38.1-1-29.000

REQUESTED INFORMATION
APA Project No. 2021-0276

Please submit your response to this Notice by email to frederick.aldinger@apa.ny.gov. All application submissions should be in PDF or similar format and be legible. Electronic copies of plans must be fully scalable.

April 16, 2025

Before addressing each of Staff's requests or comments, to assist Staff in its analysis of Applicant's ("UCI") response to the APA's Fifth Notice of Incomplete Application ("NIPA"), below is a summary and clarification on key aspects of the project Staff has raised concerns over as being inconsistent.

While a number of issues have been raised during this process, ranging from operational impact on the environment to commercial versus urban use of the site, the entire issue appears to have been reduced to one of noise. Our information and point of view can be summarized as follows:

- We are generating less noise (over a five-year period, only 7 and ½ seconds of impulse noise) than sources ranging from chainsaws to an active mine site less than a mile away. The noise to be generated is equivalent to or less than that of a hunting firearm at any of the receptor sites.
- The APA has already approved and sanctioned greater noise generators than proposed here, closer to more sensitive areas, so there is precedent for our approval as we are below the impact of existing permits already issued.

- We have demonstrated, through extensive modeling, analysis and world recognized and accepted methods and research institutions that our presented data is well below any regulatory defined maximums and numerous experts have validated such.
- While Staff and UCI may not agree with regulatory and legislative processes for assessing noise and environmental impact, we have nonetheless followed those processes (specifically NYS DEC and other State mandated procedures and guidance) for determination of data provided. Further analyses, beyond those mandated, merely add to costs, delays and negatively impact the local community as well as the National Security of the United States.

We have gone to great effort to cooperate with Staff and address their concerns and hope this issue can be resolved in the near future.

With regard to responding to the specifics of the NIPA, we respectfully provide the following.

First, there are concerns that the noise level of the sound source has changed throughout the application process. Initially, UCI's application only specified that the range would be used to develop and assess the internal ballistics of various kinetic systems used by the US military to determine the effectiveness of various approaches and techniques used in the manufacturing of cannon barrels. UCI believed it was unnecessary to disclose the exact model of cannon barrel to be tested due, in part, to misplaced negative connotations associated with large caliber military weapons. UCI in subsequent submissions to Staff specified that the intended cannon barrel for testing will be the assembly for 155 mm Howitzers.

Below is a breakdown of how the projected noise level "changed" from the filing of application to present:

- 180 dB (Application p.28)
- 185 dB (Response to 1st NIPA pp. 3, 4) – maximum based on US Amy publication for any Howitzer (not just the type to be tested)
- 183 dB (Response to 1st NIPA p. 4) – applicable to the 155mm howitzer barrel assembly to be tested
- 185 dB (Response to 2nd NIPA) – revised at Staff's request to the higher reported noise level.
- 166.1 dB(A) (Response to supplement to 2nd NIPA p. 3) – revised based on US Army publication for the howitzer assembly to be fired. First time using A-weighted decibels.
- 176 dB(A) (February Sound Study p. 63) – This number was typed in error.
- 180.8 dB / 163.2 dB(A) (Reply to 4th NIPA p. 3) – revised as February Sound Study had transcription error.
- 180.8 dB / 163.2 dB(A) (September Sound Study).

Second, the location and height of the sound source has remained the same throughout the application process. Although, it is apparent that UCI's written submissions had not clearly identified the exact location of the sound source. The sound source, which will be the subject of testing, will be and always remain at the center of the firing pad. UCI will not conduct tests outside the center of the pad. Moreover, the location of the receptors and that of the sound source have not changed in the sound propagation model. The distance from the sound source to each monitoring location listed in Section 3.3 of each sound study is an approximate distance from the receptors to the sound source. The sound propagation calculations use a more exact scale and the distance between each receptor from the sound source is referenced directly from the exported sound propagation model results (Appendix F). *See* Table 1 for the variations in distance.

Table 1: Change in Distance from Receptor to Center of Firing Pad Throughout Submissions

Receptor	**Location**	**Sound Study [Sec. 3.3] (ft.)**	**Sound Study [Appendix F] (m.)**	**Dec. 2023 Response (ft.)**	**Difference (ft.)**
M-1	Residential Receptor R-1	5,800	1,815.25	5,955	+155
M-2	Residential Receptor R-42	9,500	3,025.51	9,925	+425
M-3	Along Route 9	7,700	2,355.21	7,726	+26
M-4	Wild Forest land to Southwest	5,200	1,496.32	4,908	-292
M-5	Wild Forest land to Northeast	510	169.84	554	+44

Third, all supplied sound studies have identified the height of the sound source as 6.6 feet (2 meters). UCI will not change the height over the course of the tests – this is fixed.

Lastly, with respect to the calculated sound pressure levels, below is a chart (Table 2 below) detailing the highest noise pressure level calculated (in dB(A)) in each UCI response, with an explanation of the changes.

Table 2: Change in Calculated Sound Pressure Levels in Submissions.

Receptor	Feb. 2023 Sound Study	Sept. 2023 Sound Study	Sept. 2023 Sound Study	Dec. 2023 Response	Dec. 2023 Response	Dec. 2023 Response
	Table 1[1]	Table 2a[1]	Table 2a[2]	Table 1[2+]	Table 2[1]*	page 3[2]
M-1	75	75	67	67	90	N/A
M-2	71	71	71	71	86	N/A
M-3	73	73	73	73	88	N/A
M-4	79	79	79	79	92	N/A
M-5	107	107	100	100	111	100
State Land Corner[3]	N/A	N/A	N/A	N/A	N/A	102

[1] Without Sound Mitigation Berm
[2] With Sound Mitigation Berm
[3] Added to address APA comment
* Calculated using hemispherical straight line attenuation method
[+] Includes temperature and humidity variables

In summary, below are the calculated sound pressure levels for the project based upon the following parameters:

- Sound Source Noise Level: 180.8 dB / 163.2 dB(A)
- Sound Source Height: 6.6 ft. / 2 m
- Receptor Height: 5 ft.
- Temperature: 68°F / 20°C [yearly average]
- Humidity: 70% [yearly average]
- Wind: 11 mph sustained from noise source
- Ground factor: 0.7 G
- Sound Mitigation Berm in place
- Lowest Recorded Ambient Sound Level at each receptor [see Table 3 (following page)].

Table 3: Final Calculated Projected Sound Pressure Levels.

Receptor	Distance from Center of Pad to Receptor (ft.)	Recorded Ambient Sound Level (dB(A) Leq)	Calculated Impulse Sound Pressure Level (dB(A))	Modeled Ambient Noise (dB(A) Leq)	Change in Ambient Noise (dB(A))
M-1	5,955	56.7	67	56.7	0
M-2	9,925	40.8	71	41.2	0.4
M-3	7,726	59.6	73	59.6	0
M-4	4,908	39.1	79	41.9	2.8
M-5	554	34.7	100	59.7	25
State Land Corner	350	N/A	102	N/A	N/A

1. Staff Request: The provided materials include a revised sound study prepared by H2H Geoscience Engineering PLLC (referred to herein as the Revised Noise Analysis). The noise modeling included in the Revised Noise Analysis utilizes receptor distance measurements from the proposed gravel pad but does not clarify which portion of the 100-foot by 100-foot pad the measurements are made from (e.g. at the nearest edge or corner of the gravel pad, the center, or the furthest edge). Varying the location of the howitzer assembly on the gravel pad and the corresponding receptor distance could result in a discrepancy of 141 feet (hypotenuse of pad), which could skew or reduce the estimated sound pressure level in inverse proportion to the square of the distance or 6 dB at 100 feet. As stated in UCI's February 28, 2023, response to the Agency's Third NIPA, "…the specific placement of instrumentation and test articles will vary within a general range based on test requirements. All instrumentation and test articles are portable and will be emplaced before and after each test. As no permanent structures will be deployed, exact position of placement may vary each time."

Response: The sound source will be fired from the same location in the center of the 100-foot by 100-foot firing pad. The center of the firing pad was used in all prior sound propagation modeling although not explicitly identified in the materials. Moving the sound source to the edge of the pad will be a maximum of 70 feet toward a monitoring location; half the distance if we start in the center, not 141 feet. A 70-foot reduction in distance from the sound source to each monitoring location is used for "Edge of Firing Pad" distances in Table 5 below. As demonstrated below, moving the sound source to the edge of the pad will have negligible effects on the calculated sound pressure level at each monitoring location. (However, again, the sound source will be at the center of the firing pad.)

For this demonstration, the sound pressure levels are calculated using the hemispherical straight-line attenuation method to simplify the comparisons and does not include the sound mitigation berm to show “worst case scenario results”.

$$L_p = L_W - \left|10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)\right|$$

Lp = Sound Pressure Level
Lw = Sound Power level = 163.2 dB(A) (barrel of the M109, 155mm howitzer)
Q = Directivity Factor = 2 (hemispherical sound propagation)
r = Distance to source (meters)

Table 4:
Calculated Sound Pressure Level at Monitoring Locations from Sound Source at Center of Firing Pad

Monitoring Location	Distance From Center of Firing Pad to Monitoring Location (ft.)	Calculated Sound Pressure Level (dB(A))
M-1	5,955	90.0
M-2	9,925	85.6
M-3	7,726	87.8
M-4	4,908	91.7
M-5	554	110.7
State Land Corner	350	114.7

Table 5:
Calculated Sound Pressure Level at Monitoring Locations from Sound Source at Edge of Firing Pad

Monitoring Location	Distance From Edge of Firing Pad to Monitoring Location (ft.)	Calculated Sound Pressure Level dB(A)
M-1	5,885	90.1
M-2	9,855	85.7
M-3	7,656	87.9
M-4	4,838	91.8
M-5	484	111.8
State Land Corner	280	116.6

In sum, moving the sound source to the edge of the firing pad has a maximum increase of 1.9 dB(A) at the corner of State land classified as Wild Forest, 1.2 dB(A) at M-5, and less than 0.1 dB(A) at the remaining monitoring locations. (However, again, the sound source will be at the center of the firing pad.)

Staff Request: Please provide cross-section sheet(s) depicting the proposed typical M109 155 mm howitzer and assembly set up to be utilized on site, including all proposed instrumentation and test articles, that is drawn to scale and depicts howitzer barrel and assembly dimensions and muzzle location. Please label the location of the noise source and its associated sound pressure level source height as measured from the finished grade of the pad.

Response: The muzzle of the 155 mm howitzer barrel assembly is located 6.6 feet above the ground surface and will be that height for all tests (see September 2023 Sound Study, Page 8, Appendix D). Cross-sections of the 155 mm howitzer barrel assembly, and muzzle location (Sound Source) are shown on Figure 2. The location of "Instrumentation and test articles" will vary and depends solely on details of the experimental set up. All instrumentation will be human-portable, with no single component exceeding 1 cubic meter in volume. Any other instrumentation will be directly attached to the barrel assembly. Instrumentation is not of the size to affect calculated sound levels.

Details of the system, as requested cannot be provided. The information requested is considered Controlled Unclassified Information (CUI) Staff advised that information in support of the application is subject to public review. Therefore, specifics as to the system to be used are not being provided.

Staff Request: To allow for review of worst-case scenario noise impacts, please provide scaled cross-section plan sheet(s) depicting the distance between the closest point of the proposed gravel pad or the noise source, whichever is closer, to each of M1- M5, and between the closest point of the proposed gravel pad and the receptor located at the southwest corner of the nearest state land parcel. Please depict the proposed berm on each of these plan sheets.

Response: As stated above, the sound source will only be fired from the center of the firing pad. Nonetheless, moving the sound source to the edge of the firing pad "to provide a worst-case scenario" does not have a significant effect on results (see response above).

Cross sections from the Sound Source (located at the center of the Firing Pad) to the monitoring locations M-1, M-5 and the Wild Forest property corner (R-46) are included as Figure 1. The Sound Mitigation Berm is shown to scale on Figure 1 & 2.

2. Staff Request: Please clarify what materials the berm will be constructed with, and any associated stabilization measures and other erosion and sediment controls.

Response: The berm will be constructed of dirt from the property and will be vegetated

upon completion. Coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity is not required because total disturbance will be under one (1) acre. The DEC has confirmed this.

3. Staff Request: Please provide an evaluation of other potential noise mitigation measures, including enclosures and/or silencers (schalldampfer). Please explain why none of these other noise mitigation measures are included as part of the proposal.

Response: Staff have deemed this comment satisfied as of May 8, 2024. No further response required.

4. Staff Request: Please explain why there are separate tables, calculations and conclusions made in the UCI written response received on December 7, 2023, that are not included in the Revised Noise Analysis. For example, as indicated in the Appendix D, Model Data, the noise analysis model input of atmospheric absorption utilizes 20ºC (68ºF), and 70% humidity, and does not include an evaluation of varying weather conditions. However, UCI's written response does include information on varying weather conditions and provides separate tables, including Table 1 that references the modeled sound levels and states that "testing is not anticipated to take place under these conditions" referencing temperature 41ºF/humidity 0%. Another example of this discrepancy is that the UCI response states "(T)he modeled sound pressure level is 130 dB/107 dB(A) at M-5, and 132 dB and 111 dB(A)at State Land classified as Wild Forest property corner;" however this is not discussed or presented in the Revised Noise Analysis. In addition, the UCI response section references the July 2023 Sound Study and not the Revised Noise Analysis.

Response: UCI included Table 1 in the December 7, 2023, written response to explain how environmental factors have no impact on the study's conclusion. (Reference to a July 2023 Sound Study was a drafting oversight.) Table 2 Modeled M109 Sound Levels (with Sound Mitigation Berm) Varying Atmospheric Conditions has been added on page 9 of the November Sound Study, § 4.3.2. The modeled sound pressure levels (with Sound Mitigation berm) at the Wild Forest Property corner can be found on page 15 of the Sound Study, § 5.0.

In addition, weather conditions will not impact noise attenuation. This is supported by the DEC publication Staff referenced previously. Please see Section V.A. "Environmental Setting and Effects on Noise Levels," on pages 8 through 11, specifically paragraph 3, concerning temperature and humidity.

Furthermore, paragraph 4, "Time of Year," and paragraph 5, "Wind," also identify that

sound pressure levels are not affected by season or direction of wind. A noise source in summer has "the greatest potential for causing annoyance because of open windows, outside activities, etc." This is a subjective factor based on a behavioral response to a noise source which is not scientifically measurable. Nonetheless, the nearest inhabited residence is 1 mile away and is the landowner's residence, and the nearest State land classified as Wild Forest has little to no public use.. Concerning the environmental factor of wind, DEC's noise policy states:

> **[while] it is true that sound levels upwind of a noise source will be reduced, receptors downwind of a noise source will not realize an increase in sound level over that experience at the same distance without wind. This dispels the common belief that sounds levels are increased downwind due to wind carrying noise.**

Per NYSDEC's Program Policy of Assessing and Mitigating Noise Impacts, and UCI's prior modeling of sound pressure levels at various temperatures and humidities, the September 2023 Sound Study utilizing the average temperature and humidity of the project site and a 11-mph wind blowing from the noise source towards receptors is sufficient and does not need to be revised. In sum, UCI's proposal complies with DEC policies and procedures.

5. Staff Request: If testing will not be performed in late fall, winter, or spring conditions when the temperature of 41ºF/humidity 0% scenario is a seasonal possibility, please explain why the Revised Noise Analysis included noise monitoring conducted on December 21 and 22, 2022, but model inputs included summer conditions of 20ºC (68ºF), and 70% humidity. Please clarify the proposed months of operation and any other proposed atmospheric operating restrictions.

   Staff Request: Additionally, application materials previously stated that there would be a maximum of two shots fired per day fired for a maximum of three consecutive days, with an average of 30 shots per year, and that shots would occur for a period of five years. The UCI Response received December 15, 2023, states that testing was not anticipated to take place at conditions of 41 degrees Fahrenheit and 0% humidity, and that conditions in the first column of Table 1 are typical for the project site during summer months. Please provide the proposed maximum number of firings per week, month, and year of the testing period.

Response: Staff have deemed this comment satisfied as of May 8, 2024. No further response is required.

6. Staff Request: Please revise Image 1 to depict the location of the 100-foot by 100-foot pad, all state land boundaries, the southwest corner of the nearest

state land parcel located approximately 300 feet from the northeast corner of the firing pad, the nearest dwellings (including the Pulsifer residence), receptor locations M1 – M4, and the closest point of the proposed gravel pad or the noise source, whichever is closer, to each receptor.

Response: Staff have deemed this comment satisfied. No further response is required.

7. Staff Request: A Norwegian study titled "Noise emission data for M109, 155 mm field howitzer", prepared by the Norwegian Defense Research Establishment (FFI), and dated 5 December 2007 (the Norwegian study), is the only source of information included in the application providing noise level data from howitzers. This study includes a noise level of 130.5 dB measured at 803 feet from a howitzer. The Revised Noise Analysis appears to use this 130.5 dB measurement from the Norwegian study to calculate a modeled source noise level for an M109 155 mm howitzer of 180.8 dB. The Revised Noise Analysis then uses 180.8 dB to model noise levels at the M5 receptor on State land as 127 dB, and noise levels at the nearest residence as 100 dB. The Noise Analysis then determines that the 3.5-dB difference between the noise level data in the Norwegian Study and the modeled noise levels at the project site show "correlation within ISO standards." Please provide an explanation of these ISO standards and the asserted correlation, including a clarification of whether the ISO standards are appropriately used in this context. Please also provide any other available documentation confirming that 3.5 dB is appropriately cited as the maximum limit of error for this proposal.

RESPONSE: The International Standards Organization (ISO) is the premier standards setting and scientific body in the world. It is an independent, non-governmental, international standard development organization composed of representatives from the national standards organizations of member countries. ISO represents the primary source for scientific and technical standards in all fields of science, engineering, technology, research, development, test and evaluation.

ISO was founded on 23 February 1947, and (as of July 2024) it has published over 25,000 international standards covering almost all aspects of technology and manufacturing. It has over 800 technical committees (and subcommittees responsible for standards development.

ISO standards are the *de facto* source for protocols and undisputed array of methods, where applicable, for test and evaluation.

In accordance with ISO standards, the modeled sound pressure level at M-5 is 130 dB / 107 dB(A) and 132 dB / 111 dB(A) at the property corner of State Land classified as Wild Forest. With the additional mitigative effects of the Sound Mitigation Berm (Figure 4) the

sound pressure level at M-5 is 124 dB / 100 dB(A) and 127 dB / 102 dB(A) at the property corner of the State Land classified as Wild Forest. The closest residential structure to the Firing Pad (R-1) is 5,200 ft. northeast with a model impulse sound level of 101dB / 69 dB(A) implementing the Sound Mitigation Berm (Figure 4). During the December 2022 ambient monitoring study truck passes on Hale Hill Road (adjacent to R-1) were frequently measured above 75 dB(A).

The accuracy of a sound propagation model is dependent on the accuracy of the parameters input to the model. The inputs to the sound propagation model are:

- Sound Source Power Level
- Temperature / Humidity
- Topography (responsible for barrier attenuation)
- Ground Factor

The following is a description of how each parameter was determined.

Sound Source Power Level-

The sound power level used in the model is from the Norwegian study titled “Noise emission data for M109, 155 mm field howitzer”. The study was conducted to evaluate the sound emission of a M109, 155mm Field Howitzer (same Sound Source proposed to be used by UCI). The data collected in the study was vetted, approved and used by the Norwegian Defense Estates Agency to determine the sound level produced by a howitzer near military firing ranges and training fields.

Temperature / Humidity-

The attenuation of sound propagating outdoors between a fixed source and receiver fluctuates due to variations in temperature and humidity along the propagation path. To demonstrate how fluctuations in temperature and humidity affect modeled sound levels the following scenarios shown in Table 6, below, were modeled. The first column (Temperature 68ºF / Humidity 70%) represents the conditions used in the sound study and are typical for the project site during summer months. The maximum difference from modeled conditions is 3 dB(A) at M-4 and M-2 (Temperature 41ºF / Humidity 0%) testing is not planned to take place under these conditions.

Table 6: Modeled M109 Sound Levels (with Sound Mitigation Berm) by Temperature and Humidity

Monitoring Location	Molded dB(A) Sound Level				
	Temperature 68°F / Humidity 70% (used in sound study)	Temperature 41°F / Humidity 95%	Temperature 41°F / Humidity 0%	Temperature 95°F / Humidity 0%	Temperature 95°F / Humidity 95%
M-1	67	68	67	66	67
M-2	71	72	74	72	71
M-3	73	74	75	73	73
M-4	80	81	83	82	79
M-5	100	100	101	101	100

Topography –

The topography within the model is based on bare earth DEM from New York State LiDAR data. The accuracy of barrier attenuation in the model is directly related to the topography used. The LiDAR data used has a vertical accuracy of seven inches, providing representative bare earth barrier attenuation in the model.

Ground Factor –

Ground attenuation is how sound is reflected or absorbed by the ground based on sound frequency and ground porosity. Ground attenuation is categorized by three reflecting surfaces:

a) Hard ground - includes paving, water, ice, concrete, and all other ground surfaces having a low porosity. Hard ground will reflect sound. Hard ground is represented by a ground factor of G=0.

b) Porous ground – includes grass, trees or other vegetation, and all other ground surfaces suitable for the growth of vegetation. Porous (soft ground) will absorb sound. Porous ground is represented by a ground factor of G=1.

c) Mixed ground – consists of both hard and porous ground. Mixed ground will absorb or reflect sound based on sound frequency and a ground factor of G ranging from 0 to 1.

The study area is composed of porous ground; a ground factor of G=0.7 is used in each sound propagation model to be conservative.

ISO Acoustics - Attenuation of sound propagation outdoors states under Clause 9, Accuracy and Limitations of the Method (ISO 9613-2:2024), states, “The attenuation of sound propagating outdoors between a fixed source and receiver fluctuates due to

variations in the meteorological conditions along the propagation path. Restricting attention to moderate downwind conditions of propagation, as specified in Clause 5 (Meteorological Conditions), limits the effect of variable meteorological conditions on attenuation to reasonable values." Reasonable values are stated to ±3 dB though can be larger dependent on octave band sound pressure levels.

The accuracy of modeled sound pressure levels is directly related to the accuracy of input parameters. As discussed above, the source sound power level, topography, and ground factor are reflective of real-world conditions onsite and do not introduce inaccuracies within the model that would produce sound pressure levels higher than currently modeled sound pressure levels. Inaccuracies in modeled sound pressure levels at each monitoring location related to meteorological conditions (temperature/humidity) are demonstrated to be ±3 dB (Table 6). When comparing modeled sound pressure levels at the project site to the recorded sound level data in the Norwegian Study the modeled sound pressure levels and recorded sound pressure levels are within 3.5 dB.

> Staff Request: Please confirm through field-verification at an authorized location and through independent third party verifications that 180.8 dB is the noise level produced by M109 155 mm howitzers.

Response: The are two reliable publications which support an estimated 180.8 dB / 163.2 dB(A) noise level, and explained the methodological approach used to reach this calculation. These publications have previously been submitted. The first publication is the Norwegian Study, which professional engineer and weapons design expert, Dr. Bob Dillon, in prior meetings with Staff (his CV is attached as Appendix E to UCI's response to the APA's March 1, 2022, letter), has attested to the publication's authenticity and reasonableness. The second is a publication from the US Army Center for Health Promotion and Preventative Medicine Hearing Conservation Program titled "Noise Levels of Common Army Equipment" (see page 4 of UCI's reply to the First NIPA). This publication identifies the peak pressure level to be 166.1 dB(P) in the fighting compartment, with hatches open, for a self-propelled M109 155mm howitzer and a peak pressure level of 178 dB(P) at the gunner position for a towed 155mm howitzer. As the noise source is only the barrel assembly of the 155mm howitzer, UCI's calculated higher noise level of 180.8 dB / 163.2 dB(A) is reasonable based on the other data supplied.

> Staff Comment: Please note that NYSDEC's Program Policy "Assessing and Mitigating Noise Impacts" dated October 6, 2000 last revised February 2, 2001 states that "In determining the potential for an adverse noise impact, consider not only ambient noise levels, but also the existing land use, and whether or not an increased noise level or the introduction of a discernable sound, that is out of character with existing sounds, will be considered annoying or obtrusive." The approximate noise level of 127 dB does not appear to be in character with the recorded ambient noise level of approximately 37.2 dBA,

which per NYSDEC's noise policy, is most similar to wilderness noise levels at approximately 35 dBA.

Response: UCI has noted that impulse noise levels from lawful firearms used for hunting ranges from 160 dB (12-gauge shotgun with an 18.5-inch barrel) to 164 dB (.357 Magnum). Chainsaws produce continuous noise levels between 105 dB and 120 dB. Naturally occurring thunder produces an approximate noise level of 120 dB. These figures are not A-weighted.

The modeled noise level at the closest corner of State land classified as Wild Forest to the center of the firing pad is 127 dB (102 dB(A)) with the sound mitigation berm. This is 37 dB(A) greater than a noise level of 35 dB(A) but is 37 dB less than common hunting firearms.

For further context, a single shot from the 155mm Howitzer creates 50 milliseconds of impulse sound exposure. There will be 30 shots per year for five years (150 total). This means that over the life of the project (five years), there will be ***7,500 milliseconds*** of impulse sound exposure.

Notwithstanding the above, there are three permitted hard rock mining operations within a 2.1-mile radius of the project site that are also immediately adjacent to State lands classified as Wild Forest. They are all high pressure level noise sources in the vicinity. The continuous noise levels produced by the mining operations far exceed those of UCI's proposed project, and the impulse noise produced by mines is generally the same or greater than a single shot from a 155mm Howitzer.

8. Staff Request: The "Noise emission data for M109, 155 mm field howitzer" study referenced in the Revised Noise Analysis references a maximum charge of 5 modules DM72 with each module containing 2.44 kilograms propelling charge, while USACHPPM materials referenced in the UCI response received by the Agency July 18, 2022 reference the sound level for a M4A2 zone 7 charge. Please confirm that this will be the maximum charge used. Please also explain how the two charges compare and the effect will have on the level of sound produced.

Response: All calculated sound pressure levels submitted by UCI are based on 5 modules DM72 charges with 2.44 kg of propellent. M4A2 zone 7 charges have nominally the same energy and would produce the same calculated sound pressure levels. Any further specific details of the performance of the 155mm Howitzer are sensitive and protected information not available to the APA.

9. Staff Request: Please provide an updated noise analysis that accounts for the confirmed height of the noise source from the gravel pad and the location of

the noise source at the closest point of the gravel pad to each receptor. This updated noise analysis must include all tabular, calculated, and conclusory information included in the latest UCI response, Modal Data in Appendix D, and barrier attenuation calculations that account for the most conservative/worst case scenario height and location of the noise source in relation to each receptor. The updated noise analysis must also account for all proposed months of operation and any proposed atmospheric operating restrictions. In addition, the analysis must include revised tabular information, Modal Data in Appendix D, and barrier attenuation calculations that account for the height and location of the noise source in relation to each receptor, and must include sound pressure levels expressed as both dB and dBA. This updated analysis must include a cover sheet with the seal of a NYS licensed professional engineer.

Response: Staff is requesting an updated noise analysis to include modeling of the noise source from 6 separate locations on the firing pad, in addition to the proposed firing location at the center of the firing pad. However, to achieve viable and repeatable data, the source must stay in the same place between tests and that will be the center of the pad, as mentioned above. These 7 separate modeled scenarios must also include calculations for at least 3 separate noise source heights: the confirmed height of the sound source (6.6 ft.), an unspecified "most conservative" height, and unspecified "worst case scenario" height. Accordingly, 21 modeled scenarios would be needed. To account for weather conditions for all proposed months of operation – which here is year-round – for the 21 modeled scenarios would require an additional 12 analyses, resulting in a total of 252 modeled scenarios. To conduct modeling for the "proposed atmospheric operating restrictions" will require a minimum of 3 different scenarios for each potential month of operation: average monthly condition, plus the warmest and coldest conditions. The total number of modeled scenarios would amount to 756.

Moving the sound source to the edge of the pad will have negligible effects on the calculated sound pressure level at each monitoring location and will never occur during the tests (see response to Comment 1). UCI will not be changing the height of the sound source from 6.6 ft. and UCI's sound propagation model includes atmospheric conditions.

The Sound Source will only be tested from the center of the Firing Pad at a height of 6.6 ft. above grade (Figure 1 & 2). Additional information on attenuating factors included within the model (distance attenuation, atmospheric absorption, ground attenuation, and barrier attenuation) have been added to the November Sound Study, § 4.3. To demonstrate the effect of each attenuating factor used in the model straight line projection sound pressure levels (distance attenuation only), are compared to sound propagation modeled results (November Sound Study, § 4.4. Table 3). The tabular information shows the distance from the Sound Source to each receptor, and attenuation from the Sound Source to each receptor. Modeled Z-weighted sound pressure levels from the Sound Source to receptors (with and without the Sound Mitigation Berm) are shown in Table 4a

of the November Sound Study, § 4.5.1

Norfolk Beier PLLC

By: 
_____
Matthew D. Norfolk, Esq.
Authorized Representative
On behalf of Michael Hopmeier, Sponsor,
and Unconventional Concepts, Inc., Applicant

SOUND STUDY

UNCONVENTIONAL CONCEPTS, INC.

APA PROJECT #2021-0276

NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency
RECEIVED
Date: July 10, 2025

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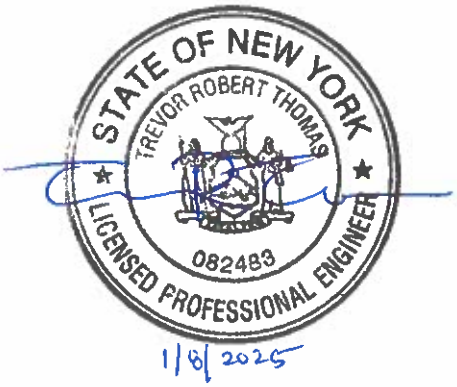

I, Trevor Thomas, a licensed Professional Engineer in the State of New York, hereby certify that the work represented in the document is accurate, in conformance with applicable codes at the time of submission and has been prepared in conformance with normal and customary standards of practice and with a view to the safeguarding of life, health, property and public welfare.

Date:

November 2024

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1.0 INTRODUCTION

Unconventional Concepts, Inc. (UCI) has proposed to the Adirondack Park Agency (APA), an application for the operation of a projectile testing range in Lewis, New York. The range (Site) is at 195 Hale Hill Lane (Figure 1). Bowman Consulting, Engineering, Land Surveying and Landscape Architecture (Bowman) prepared this report to identify and evaluate the potential impacts of off-site sound propagation from the proposed application. The potential sound impacts associated with the application were assessed in accordance with the requirements set forth by the Adirondack Park Agency (APA) and the New York State Department of Environmental Conservation (NYSDEC).

2.0 PROJECT BACKGROUND

UCI is proposing to operate a projectile testing range for use in supporting research and development operations. The range will be developed to assess the internal ballistics of various kinetic systems used by the United States. The focus is to determine the effectiveness of various manufacturing approaches and techniques used in the manufacture of cannon barrels. The goal of the overall project is to decrease the weight of these systems to ensure the most efficient means of manufacturing and recuring cost of ownership, thereby reducing waste and cost, as well as improving performance.

This effort will focus on the test and evaluation of these new systems in support of a critical US Army research program managed by Benét Laboratories at Watervliet Arsenal in Albany, NY. The project will focus on the instrumentation and firing of these systems in a constrained area to allow for measurement and assessment of the internal ballistics and kinetic and kinematic effects of these modern designs.

All test equipment and instrumentation will be portable; equipment will be deployed as needed to the Site for a test and will then be completely removed at the end of the test.

The testing schedule is as follows:

- A shot will only be fired on weekdays between the hours of 10:00 AM and 4:00 PM.
- A maximum of two shots will be fired in one day.
- Shots will be fired a maximum of three consecutive days.
- Testing is anticipated to continue for a period of five years, with an average of 30 shots per year.

The Site is on land owned by Pulsifer Logging, LLC (38.1-1-31.000). UCI is using the land with the landowner's (written) permission. The Sound Source (155 mm howitzer barrel assembly) will be located in the center of a 100 ft. X 100 ft. crushed gravel pad (Firing Pad). A haul truck will be used to transport the barrel assembly to the firing pad. The Operations Control Area is adjacent to the Firing Pad; the Target Area is 625 ft. east of the Firing Pad (Figure 2). The 155 mm howitzer barrel assembly and the Haul Truck are the only sources of sound that could produce a potential signific environmental impact associated with the project.

The Site is accessed via an access road off Hale Hill Road. The area surrounding the Site is heavily forested with a topographic high to the east and south. NYS Route 9 is located approximately 7,000 ft. to the east. Within a two-mile radius of the site (Project Area) forty-four Residential Receptors (RR) were identified. The closest RR is the Pulsifer residents (R-1) 5,200 ft. to the northeast off Hale Hill Road. Five parcels of State Land classified as Wild Forest fall within the two-mile radius; no parcels of State Land classified as Wilderness are within the two-mile radius (Figure 1).

Bowman developed a Scope of Work (SOW) approved by the APA specifying the locations sound level monitoring was conducted. The SOW incorporating the APA's November 28, 2022 comments on the location of Monitoring location M-3 and M-4 is attached as Appendix E.

3.0 SOUND LEVEL MONITORING

Sound level monitoring was conducted by Bowman on December 20, 2022, and December 21, 2022. Monitoring was conducted at the five locations identified in the SOW (Figure 1).

3.1 ENVIRONMENTAL CONDITIONS

Weather data was collected from a weather station located at The Silo (Figure 1).

3.1.1 December 20, 2022

During the study period, the weather conditions included temperatures between 27 °F and 31 °F, winds out of the south between zero and six miles per hour, 70% to 83% humidity, and clear to partly cloudy skies. Roads were dry; six-fourteen inches of fresh snow was on the ground from the previous storm.

3.1.2 December 21, 2022

During the study period, the weather conditions included temperatures between 23 °F and 32 °F, winds out of the southwest between zero and four miles per hour, 75% to 83% humidity, and clear to partly cloudy skies. Roads were dry; six-fourteen inches of fresh snow was on the ground from the previous storm.

3.2 MONITORING EQUIPMENT

Sound level measurements were recorded using calibrated Casella CEL-633 ANSI or Quest SoundPro DL-2-1/3 sound level meters. Each monitor was set to log A-weighted, fast response, at one-second intervals. Each Casella monitor was programed to record audio to aid in identifying sound sources. Each unit was field calibrated before each monitoring event; each unit was also laboratory-qualified, technician calibrated (Appendix B). Each meter was tripod mounted at an approximate height of 5 feet, microphones were covered with windscreens. Monitors were outfitted with external batteries.

3.3 MONITORING LOCATION SOUND LEVELS

Sound levels were collected as discussed in Section 3.2 at each monitoring location between 10:00 a.m. – 4:00 p.m. (proposed testing hours). Sound level data was cleaned to remove anomalous sound sources, and data outside monitoring periods. Staffed sound level monitoring was conducted at each monitoring location to log the relative loudness, and the types of sounds that could be heard at each monitoring location. Photos of each monitoring location are provided in appendix B.

3.3.1 Monitoring Location M-1 –

Monitoring location M-1 is adjacent to Residential Receptor R-1 on Hale Hill Road at elevation 705 ft. amsl. 5,955 ft. from the Firing Pad. This monitoring location will provide ambient sound levels for R-1 (closest Residential Receptor), and the surrounding area of Hale Hill Road.

Ambient sound levels – with normal activities taking place the results of sound monitoring at M-1 were as follow:

December 20, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Heavy truck traffic on Hale Hill Rd. to Pulsifer Mill,
- Site operations at Pulsifer Mill,

Secondary –
- Aircraft flyover, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 26.1 to 81.1 dBA.
- The average equivalent continuous sound level (L_{eq}) was 56.7 dBA.

December 21, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Heavy truck traffic to Pulsifer Mill,
- Site operations at Pulsifer Mill,

Secondary –
- Aircraft flyover, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 27.5 to 83.0 dBA.
- The average equivalent continuous sound level (L_{eq}) was 57.2 dBA

3.3.2 Monitoring Location M-2 -

Monitoring Location M-2 is located south of the Firing Pad adjacent to Residential Receptor R-42 on Pulsifer Road at elevation 715 ft. amsl., 9,925 ft. from the Firing Pad. This monitoring location will provide ambient sound levels for the area surrounding Pulsifer Rd.

Ambient sound levels – with normal activities taking place the results of sound monitoring at M-2 were as follow:

December 20, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Traffic on NYS Route 9 and Pulsifer Road,
- Heavy truck traffic on access road to NYCO Oak Hill Mine,

Secondary –

- Distant mine noise,
- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 24.8 to 70.2 dBA.
- The average equivalent continuous sound level (L_{eq}) was 42.5 dBA.

December 21, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Traffic on NYS Route 9 and Pulsifer Road,
- Heavy truck traffic on access road to NYCO Oak Hill Mine,

Secondary –
- Distant mine noise,
- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 25.0 to 70.4 dBA.
- The average equivalent continuous sound level (L_{eq}) was 40.8 dBA

3.3.3 Monitoring Location M-3

Monitoring Location M-3 is located southeast of the Firing Pad along Route 9 at elevation 660 ft. amsl., 7,726 ft. from the firing pad. This monitoring location will provide ambient sound levels for the area along State Route 9 and adjacent commercial area.

Ambient sound levels – with normal activities taking place the results of sound monitoring at M-2 were as follow:

December 20, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Traffic on NYS Route 9,

Secondary –
- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 26.2 to 82.4 dBA.
- The average equivalent continuous sound level (L_{eq}) was 59.6 dBA.

December 21, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Traffic on NYS Route 9,

Secondary –

- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 26.1 to 86.2 dBA.
- The average equivalent continuous sound level (L_{eq}) was 61.2 dBA

3.3.4 Monitoring Location M-4

Monitoring Location M-4 is southwest of the Firing Pad next to State Lands classified as Wild Forest at elevation 1,500 ft. amsl., 4,908 ft. from the firing pad. This monitoring location will provide ambient sound levels for land classified as Wild Forest to the southwest

Ambient sound levels – with normal activities taking place the results of sound monitoring at M-2 were as follow:

December 20, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Occasional birds,
- Recreational use (snowmobiles),

Secondary –
- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 18.1 to 70.7 dBA.
- The average equivalent continuous sound level (L_{eq}) was 39.1 dBA.

December 21, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –
- Occasional birds,
- Recreational use (snowmobiles),

Secondary –
- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 19.5 to 71.4 dBA.
- The average equivalent continuous sound level (L_{eq}) was 40.9 dBA.

3.3.5 Monitoring Location M-5

Monitoring Location M-5 is located northeast of the Firing Pad adjacent to State Lands classified as Wild Forest at elevation 1,380 ft. amsl., 554 ft. from the firing pad. This monitoring location will provide ambient sound levels of land classified as Wild Forest to the northeast.

Ambient sound levels – with normal activities taking place the results of sound monitoring at M-2 were as follow:

December 20, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –

- Occasional birds,
- Recreational use (snowmobiles),

Secondary –

- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 19.6 to 65.2 dBA.
- The average equivalent continuous sound level (L_{eq}) was 37.2 dBA.

December 21, 2022
The source of sound from 10:00 a.m. to 4:00 p.m., listed in order of highest to lowest;

Primary Source –

- Occasional birds,
- Recreational use (snowmobiles),

Secondary –

- Aircraft flyovers, and
- Wind through foliage.

- One-second sound levels ($L_{eq,\ 1\text{-}sec}$) ranged from 19.8 to 58.1 dBA.
- The average equivalent continuous sound level (L_{eq}) was 34.7 dBA.

4.0 SOUND PROROGATION MODEL

4.1 SOUND SOURCE (M109A3GN 155MM FIELD HOWITZER)

A sound propagation model was developed for the area within a two-mile radius of the Firing Pad using the International Standards Organization ISO 9613 -1,2,3 standards applied in the dBmap.net noise mapping tool. The model accounts for surface reflection and absorption, atmospheric absorption, geometric divergence, weather conditions, topography, and source sound power level.

The sound power level of the Source was calculated based on the sound pressure levels shown in Table E.2 of Appendix E (Noise Emission Data for M109, 155mm Field Howitzer). The goal of the analyses was to develop data that could be used to model the attenuation of sound produced by a howitzer due to the previous lack of available information. The results of the Norwegian Defense Research Establishments (FFI) study demonstrated correlation with their recorded sound levels from the field (data used in Bowmans's analyses) and proved to be suitable for use in the FFI database.

The sound pressure levels shown in Table E.2 were measured at 803 ft. (245 meters) from the sound source by seven sensors positions at increasing angles from the direction of fire. Sensor 1 is positioned 32 degrees from the direction of fire and recorded a sound pressure level of 130.5 dB (loudest recorded sound level across the seven sensors) at 803 ft. (245 meters). The data shown in table E.2 was produced taking the energy mean of 15 shots. Using industry standard calculations, the sound power level at the Sound Source (barrel of the M109, 155mm howitzer) was calculated to be 180.8 dB (163.2 dB(A)). The Sound Source sound level is without ground corrections. Uncorrected data has a higher sound presser level than corrected data providing a conservative sound level model (see Appendix E, Table E.1, free field, compared to Table E.2, without ground correction).

Table 1 Shows the recorded sound pressure level from Table E.2 for each frequency indicated. The sound power level was calculated using the following formula.

$$L_W = L_p + \left|10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)\right|$$

Lp= Sound Pressure Level = recorded sound pressure level from Table E.2
Lw= Sound Power level
Q= Directivity factor = 1 (Spherical Sound Propagation)
r= distance to source = 245 meters

The calculated A-weighted sound power level was calculated by adding/subtracting the dB(A) Filter to the calculated sound pressure level.

The resulting total sound level 180.8 dB / 163.2 dB(A) is calculated using the formula below and the calculated sound power levels show in Table 1.

$$L_\Sigma = 10 \cdot \log_{10}\left(10^{\frac{L_1}{10}} + 10^{\frac{L_2}{10}} + \cdots + 10^{\frac{L_n}{10}}\right) \text{ dB}$$

Lε = Sum level of sound 180.8 dB(A) / 163.2 dB(A)
L_n = Sound pressure from separate sources

Table 1: Recorded Sound Pressure level / Calculated Sound Source Power level

Frequency (Hz)	**31.5**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**16000**
Recorded M109 Sound Pressure Level (dB) 245 m	120.4	116.5	105.7	90.3	101.2	99.9	96.4	93.1	88.8	86.1
Calculated Sound Power Level (dB)	179.1	175.3	164.5	149.1	160.0	158.7	155.2	151.9	147.6	144.9
Calculated Sound Power Level (dB(A))	139.6	149.1	148.4	140.5	156.8	158.7	156.4	152.9	146.5	138.3
dB(A) Filter	-39.5	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1	-6.6

All input and results of the sound propagation model are attached as Appendix F.

The Image below (Image 1) demonstrates the accuracy of the sound propagation model. Image 1 shows the modeled sound pressure level (not A-weighted) at M-5 (same location as shown on Figure 3) and a receiver located 803 ft. (245 meters) west of the source labeled “Test Point.” The sound source (barrel of the M109, 155mm howitzer (180.8 dB), and all model parameters are unchanged. The Test Point has a modeled sound level of 127 dB; the recorded sound level from Table E.2 of Appendix E is 130.5 dB showing correlation within ISO standards.

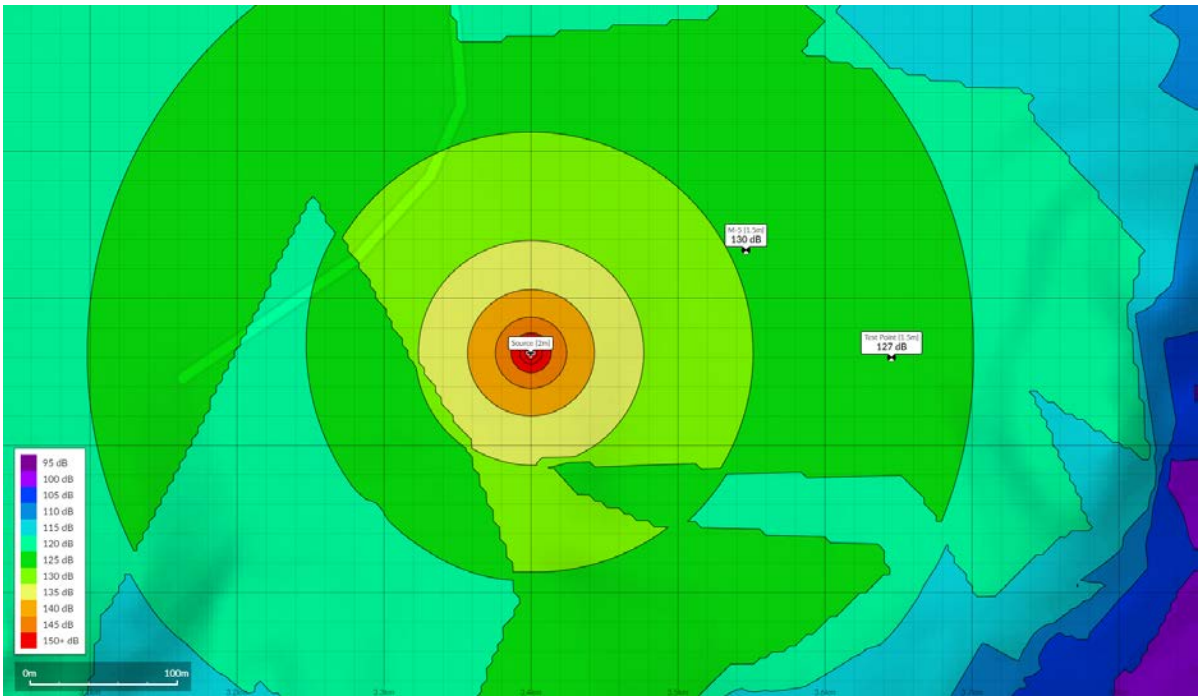


Image 1 – Modeled sound pressure level (not A- weighted) with Test Point

The model assumes moderate downwind propagation (wind direction within an arc of 90 degrees with the wind blowing from the source at 11 M.P.H.), and ground-based temperature inversion. A ground factor of 0.7 G is used to be conservative. A receiver height of 5 feet, and Sound Source height of 6.6 feet is used. This field howitzer model is typical for its type and would represent the noisiest field howitzer tested on Site. The modeled scenario shows the M109A3GN firing from the Firing Pad (only location Sound Source will be operated) as shown on Figure 2. Appendix D summaries model input data.

The sound propagation models show the modeled impulse sound level produced by the Sound Source; the duration of the impulse sound level is approximately 4 milliseconds. Model results are shown without a 13-foot berm (Sound Mitigation Berm) north of the firing pad (Figure 3) and with the Sound Mitigation Berm north of the firing pad (Figure 4). The location of the Sound Mitigation Berm is shown on Figure 1 &2. Sound pressure levels are A-weighted and shown in the form of isolines in 5 dB intervals from 45 dB(A) to 130 dB(A). Modeled sound levels at each monitoring location are labeled.

4.2 40-TON HAUL TRUCK

A sound propagation model was developed for the same two-mile radius of the Firing Pad following the same standards. The model assumes moderate downwind propagation (wind direction within an arc of 90 degrees with the wind blowing from the source at 11 M.P.H.), and ground-based temperature inversion. A ground factor of 0.7 G is used to be conservative. A receiver height of 5 feet, and sound source height of 6.6 feet is used. The sound power level used for the 40-ton Haul Truck (117.6 dB / 115.7 dB(A) is provided in the dBmap database. The Sound Mitigation Berm was not used for the 40-ton haul truck sound propagation model. Appendix D summaries model input data.

The 40-ton Haul Truck being modeled is similar to or louder than the haul truck that will be used to transport the barrel assembly and measurement equipment to the Firing Pad. Figure 5 shows the access road the Haul Truck will be operating on to access the Firing Pad. The Haul Truck was modeled operating at three

locations on the access road that would have the highest modeled sound level at identified receptors due to proximity and topography.

The sound propagation model shows the modeled sound level produced by the 40-ton Haul Truck (Figure 5). Sound levels are A-weighted and shown in the form of isolines in 5 dB intervals from 20 dB(A) to 85 dB(A). Modeled sound levels at each monitoring location are labeled.

4.3 ATTENUATION FACTORS USED IN MODEL

Sound propagation model results are exported in tabular format to demonstrate the effect each attenuating factor has on the total modeled sound levels (Appendix F).

4.3.1 Distance Attenuation (Geometric Divergence)

Geometrical divergence refers to the spherical spreading in the free field from a point sound source (static/mobile equipment). Sound attenuates due to geometric divergence by approximately six dB for each doubling of distance from the source, independent of frequency. Attenuation, in decibels, from geometric divergence is calculated in the model using the following formula:

$$A_{\text{div}} = [20\lg(d/d_0)+11]\text{dB}$$

where

d is the distance from the source to receiver, expressed in meters;
d_o is the reference distance (=1m).

The calculated attenuation due to geometric divergence from each sound source to each receiver is shown under "Receiver Results – Full Detail" heading *Ad* (Appendix F).

4.3.2 Atmospheric Absorption

Atmospheric absorption is how sound attenuates in air based on air temperature, relative humidity, and sound frequency. Attenuation, in decibels, from atmospheric absorption is calculated in the model using the following formula:

$$A_{\text{atm}} = \alpha_{\text{atm}} d / 1000$$

where

d is the distance from the source to the receiver, expressed in meters;
α_{atm} Is the atmospheric attenuation coefficient for each octave band expressed in decibels per kilometer.

Atmospheric absorption is more significant at higher frequencies and long distances, though the effect on the overall sound pressure level is generally insignificant. To demonstrate how varying atmospheric conditions affect modeled sound pressure levels the M109 with Sound Mitigation Berm sound propagation model was run modifying temperatures and relative humidity only (Table 2). The results show that the atmospheric conditions used in the Sound Study (temperature 20ºC / relative humidity 70%) result in sound pressure levels that are a maximum of four dB(A) lower than the worst-case atmospheric conditions (temperature 0ºC / relative humidity 0%) and up to three dB(A) higher than other modeled atmospheric conditions.

It is important to mention that sound modeling typically utilizes a temperature of 68ºF and relative humidity of 70% for atmospheric conditions. It is also important to note that the freezing temperature low humidity scenario is associated with adverse weather conditions when people are not expected to be outdoors or recreating.

Table 2: Modeled M109 Sound Levels (with Sound Mitigation Berm) Varying Atmospheric Conditions

Monitoring Location	Modeled dB(A) Sound Level				
	Temperature 20ºC / Humidity 70%	Temperature 0ºC / Humidity 100%	Temperature 0ºC / Humidity 0%	Temperature 35ºC / Humidity 0%	Temperature 35ºC / Humidity 100%
M-1	67	68	67	66	67
M-2	71	73	74	72	71
M-3	73	74	75	73	73
M-4	79	81	83	82	79
M-5	100	100	101	101	100

The calculated attenuation due to atmospheric absorption from each sound source to each receiver is shown under "Receiver Results – Full Detail" heading *Aa* (Appendix F).

4.3.3 Ground Attenuation (Ground Effect)

Ground attenuation is how sound is reflected or absorbed by the ground based on sound frequency and ground porosity. Ground attenuation is categorized by three reflecting surfaces:

a) Hard ground - includes paving, water, ice, concrete, and all other ground surfaces having a low porosity. Hard ground will reflect sound. Hard ground is represented by a ground factor of G=0.

b) Porous ground – includes grass, trees or other vegetation, and all other ground surfaces suitable for the growth of vegetation. Porous (soft ground) will absorb sound. Porous ground is represented by a ground factor of G=1.

c) Mixed ground – consists of both hard and porous ground. Mixed ground will absorb or reflect sound based on sound frequency and a ground factor of G ranging from 0 to 1.

The study area is composed of mixed ground; a ground factor of G=0.7 is used in each sound propagation model to account for much of the study area being heavily vegetated (soft ground). Depending on sound level frequency, the ground factor will increase or decrease calculated sound levels. The calculated reflection or attenuation due to ground attenuation from each sound source to each receiver is shown under "Receiver Results – Full Detail" heading *Ag* (Appendix F).

4.3.4 Screening (barrier attenuation)

Barrier attenuation is how sound is screened by obstacles (houses, topography, walls, etc.). An object is considered as a screening obstacle when the following requirements are met:

- The surface density is at least 10 kg/m^2;

- The object has a closed surface without large cracks of gaps;
- The horizontal dimension of the object normal to the source-to-receiver line is larger than the acoustic wavelength for the octave band of interest.

The topography (including Sound Mitigation Berm) is the only screening object used in the analysis. The maximum barrier attenuation is 20 dB in the case of a single screen or 25 dB for multiple screens (ground surface). The calculated barrier attenuation from each sound source to each receiver is shown under "Receiver Results – Full Detail" heading *Ab* (Appendix F).

4.4 SOUND PROPAGATION MODEL COMPARISON TO STRAIGHT-LINE PROJECTION METHOD

The 155 mm Howitzer with Sound Mitigation Berm sound propagation model was used to compare straight-line projection method results to sound propagation model results. The sound source is projected to all monitoring locations with the addition of the Wild Forest property corner (Figure 4).

The calculated sound pressure level and attenuation for each sound source across each frequency to each receiver location was exported from the 155 mm Howitzer with Sound Mitigation Berm sound propagation model. Distance attenuation (Column "E") attenuates sound following the invers square law, and generally contributes to the largest attenuation in a sound propagation model if receptors are a great distance from sound sources. Attenuation due to atmospheric absorption (Column "F") varies by frequency and the effect on the overall sound pressure level is generally insignificant. Attenuation from ground effect (Column "G") varies by frequency; low and high frequency sounds are reflected while midrange frequencies are absorbed. Barrier attenuation is dependent on how screened a sound source is from a receiver. Barrier attenuation (column "I") is based on how topography screens each monitoring location (Figure 4).

From the exported data the sound level at each receiver location for the sound source due to attenuation from distance attenuation and weighting only was calculated (column "M") by adding the distance attenuation (column "E") and A-weighting (column "I") to the source sound power level (column "D"). The total modeled sound pressure levels (column "L" and "M") were calculated using the additive effect formula (below) and the data in column "J" and "K" (Table 3).

The straight-line projection method sound levels (column "N") were calculated using the distance from the source to each monitoring location (column "B") and the total sound power levels for the sound source (Table 1 & 3 Attached due to length).

The straight-line projection method for calculating sound attenuation follows the same principle as distance attenuation in a sound propagation model. Attenuation due to distance only in the sound propagation model (column "M") produced the same result as the straight-line projection method under spherical sound propagation (column "N"). The additional attenuation factors (atmospheric absorption column "F", ground effect column "G", and barrier attenuation "H") do not contribute to the same degree as distance attenuation (Table 3 Attached due to length).

4.5 EFFECT ON AMBIENT SOUND LEVELS

4.5.1 Sound Source (M109A3GN 155mm Field Howitzer)

To measure the effect the modeled impulse sound (shot fired from the howitzer) would have on ambient sound levels within the Project Area the following method is used. The recorded sound levels for each monitoring location in Section 3.3 are used as the ambient condition at each monitoring location. The $L_{eq, 1\text{-}sec}$ recorded sound levels were exported to allow each $L_{eq, 1\text{-}sec}$ sound level over the monitoring period (10:00 a.m. to 4:00 p.m.) to be viewed individually. To measure how impulse sound levels would affect the ambient sound level at each monitoring location the modeled impulse sound level without the Sound Mitigation Berm (Figure 3) and with the Sound Mitigation Berm (figure 4) at each monitoring location is input into the ambient data for that monitoring location. This was done twice to model the effect of two impulse sound levels (two shots per day). The results of each modeled scenario are compared to the recorded ambient sound levels in Table 4b (12/20/2022 ambient sound levels) and Table 4c (12/21/2022 ambient sound levels).

Table 4a: 155 mm Howitzer (Sound Source) Modeled Impulse Sound Levels

Monitoring Location	155 mm Howitzer (Sound Source) Without Sound Mitigation Berm		155 mm Howitzer (Sound Source) With Sound Mitigation Berm	
	Modeled Impulse Sound Level dB	Modeled Impulse Sound Level dB(A)	Modeled Impulse Sound Level dB	Modeled Impulse Sound Level dB(A)
M-1	105	75	99	67
M-2	101	71	101	71
M-3	103	73	103	73
M-4	107	79	107	79
M-5	130	107	124	100
Wild Forest Property Corner (R-46)	132	111	127	102

Table 4b: Tuesday, December 20, 2022, Howitzer Modeled Sound Level Summary

Monitoring Location	Recorded Ambient dB(A) Leq	155 mm Howitzer (Sound Source)			155 mm Howitzer (Sound Source) With Sound Mitigation Berm		
		Modeled Impulse Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)	Modeled Impulse Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)
M-1	57.2	75	57.2	0	67	57.2	0
M-2	42.5	71	42.8	0.3	71	42.8	0.3
M-3	59.6	73	59.6	0	73	59.6	0
M-4	39.1	79	41.9	2.8	79	41.9	2.8
M-5	37.2	107	66.7	29.5	100	59.7	22.5

Table 4c: Wednesday, December 21, 2022, Howitzer Modeled Sound Level Summary

Monitoring Location	Recorded Ambient dB(A) Leq	155 mm Howitzer			155 mm Howitzer (Sound Source) With Sound Mitigation Berm		
		Modeled Impulse Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)	Modeled Impulse Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)
M-1	56.7	75	56.8	0.1	67	56.7	0
M-2	40.8	71	41.2	0.4	71	41.2	0.4
M-3	61.2	73	61.2	0	73	61.2	0
M-4	40.9	79	42.9	2	79	42.9	2
M-5	34.7	107	66.7	32	100	59.7	25

4.5.2 40-ton Haul Truck

To measure the effect the modeled sound (Haul Truck operating on site access road) would have on ambient sound level within the Project Area the following method is used. The recorded sound levels for each monitoring location in Section 3.3 are used as the ambient condition at each monitoring location. Figure 5 and Table 5a / Table 5b show the modeled sound level at each monitoring location. The modeled sound level is well below the recorded ambient sound level at monitoring location M-1, M-2, M-3, and M-4 showing no potential impact. The modeled sound level at M-5 (66.7 dB(A)) is above the recorded ambient sound level of 34.7 dB(A). To measure how sound levels would affect the ambient sound level at M-5 the modeled sound level (Figure 4) at M-5 is input into the ambient data for that monitoring location. This was done ten times to model the effect of ten haul truck passes. No more than ten haul truck passes are

anticipated per day. The modeled scenario at M-5 is compared to the recorded ambient sound levels in Table 5a (12/20/2022 ambient sound levels) and Table 5b (12/21/2022 ambient sound levels).

Table 5a: Tuesday, December 20, 2022, 40-ton Haul Truck Modeled Sound Level Summary

Monitoring Location	Recorded Ambient dB(A) Leq	40-ton Haul Truck		
		Modeled Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)
M-1	57.2	44	-	-
M-2	42.5	20	-	-
M-3	59.6	33	-	-
M-4	39.1	33	-	-
M-5	37.2	60	37.9	0.7

Table 5b: Wednesday, December 21, 2022, 40-ton Haul Truck Modeled Sound Level Summary

Monitoring Location	Recorded Ambient dB(A) Leq	40-ton Haul Truck		
		Modeled Sound Level dB(A)	Modeled Ambient dB(A) Leq	Change from Recorded Ambient dB(A)
M-1	56.7	44	-	-
M-2	40.8	20	-	-
M-3	61.2	33	-	-
M-4	40.9	33	-	-
M-5	34.7	60	37.9	3.2

5.0 SUMMARY & CONCLUSIONS

UCI is proposing to operate a projectile testing range for use in supporting research and development operations. Testing will only occur on weekdays, between the hours of 10:00 a.m. and 4:00 p.m. No more than two shots will be fired in one day. Forty-four residential receptors, and five parcels of NYS Land identified as Wild Forest fall within the Project Area (Figure 1). Sound level monitoring was conducted at five monitoring locations on December 20, 2022, and December 21, 2022, to determine ambient sound levels within the Project Area. Potential significant sources of sound associated with the project are the testing of the 155 mm howitzer and operation of 40-ton haul truck along the site access road to transport the 155 mm howitzer and monitoring equipment to the firing pad.

Two sound propagation models, with and without the Sound Mitigation Berm, were developed to evaluate the impulse sound level produced by the Sound Source (barrel of the M109, 155mm howitzer) within the Project Area (Figure 3 & 4). The effect of the modeled impulse sound level on ambient sound levels from each monitoring location is discussed in Section 4.5.1 and summarized in Table 4b & Table 4c. An additional sound propagation model was developed to evaluate the sound levels produced by a 40-ton Haul Truck operating along the access road to the site. The effect of the modeled sound level on ambient sound levels from each monitoring location is discussed in Section 4.5.2 and summarized in Table 5a & Table 5b.

The modeled sound level for the 40-ton Haul Truck operating along the access road to the site is well below the recorded ambient sound levels at M-1, M2, M3, and M-4 indicating no appreciable change to ambient sound levels at all identify residential receptors (Table 5). No appreciable change to ambient sound levels at four of the five NYS Land parcels identified as Wild Forest is anticipated. The parcel of Wild Forest (R-45) adjacent to the Firing Pad (Figure 1 & 4) shows a modeled sound level of 60 dB(A), and a modeled ambient sound level of 37.9 dB(A) a 3.2 dB(A) change in sound levels from the 34.7 dB(A) recorded ambient on December 21, 2022.

The modeled change in ambient sound level from two shots of the Sound Source (barrel of the M109, 155 howitzer) without the Sound Mitigation Berm is below 3 dB at M-1, M-2, M-3, and M-4 indicating no appreciable change to ambient sound levels at all identify residential receptors (Table 4b &Table 4c). No appreciable change to ambient sound levels at four of the five NYS Land parcels identified as Wild Forest is anticipated. The parcel of Wild Forest (R-45) adjacent to the Firing Pad (Figure 2 & 3) shows a modeled impulse sound level of 107 dB(A) at M-5, and a modeled ambient sound level of 66.7 dB(A) a 32.0 dB(A) change in sound levels from the 34.7 dB(A) recorded ambient on December 21, 2022.

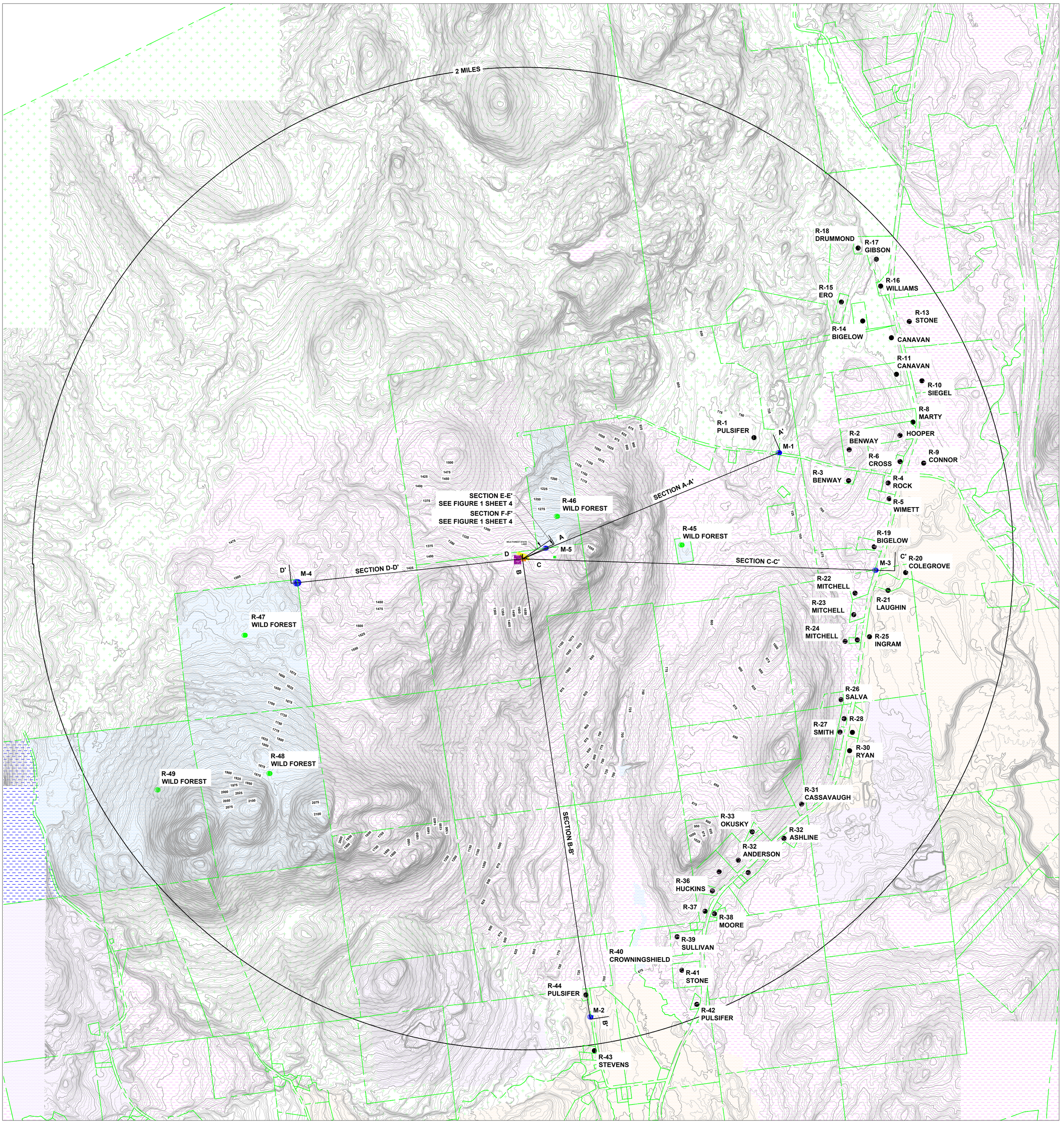
In addition to the mitigative measures currently proposed (remote location of Site / natural topographic rise between Sound Source and Residential Receptors) UCI is proposing to construct a Sound Mitigation Berm. The modeled change in ambient sound level from two shots of the Sound Source (barrel of the M109, 155 howitzer) with the Sound Mitigation Berm is below 3 dB at M-1, M-2, M-3, and M-4 indicating no appreciable change to ambient sound levels at all identified residential receptors (Table 4b &Table 4c). No appreciable change to ambient sound levels at four of the five NYS Land parcels identified as Wild Forest is anticipated. The parcel of Wild Forest (R-45) adjacent to the Firing Pad (Figure 2 & 4) shows a modeled impulse sound level of 100 dB(A) at M-5, and a modeled ambient sound level of 59.7 dB(A) a 25.0 dB(A) change in sound levels from the 34.7 dB(A) recorded ambient on December 21, 2022. The modeled impulse sound level at the property corner of the Wild Forest (R-45) parcel is 102 dB(A), and a modeled ambient sound level of 61.7 dB(A).

There are no structures identified, public trails on or means of public access to R-45. In reviewing surrounding land uses three currently permitted hard rock mining operations exist within a 2.1-mile radius of the Site. In addition, one of the currently permitted mining operations is adjacent to lands classified as Wilderness. Lands classified as Wilderness are less impacted by human use than lands classified as State Forest. Hard rock mining operations require regular blasting as part of their weekly operations, under the mines NYSDEC Mine Land Reclamation Permit an air blast limit of 133 dB measured to the closest structure outside the permit area is permitted. The closest Structure to the Firing pad is the Pulsifer residents (R-1) 5,200 ft. with a modeled impulse sound level implementing the Sound Mitigation Berm of 101 dB / 69 dB(A).

Based on the information presented in this report the proposed project does not pose a potentially significant environmental impact due to an increase in sound levels at receptors in the area.

FIGURES

FIGURE 1 –SITE OVERVIEW MAP



LEGEND:

- PROPERTY LINES
- SOUND LEVEL MONITORING LOCATIONS
- RECEPTOR - WILD FOREST
- RESIDENTIAL RECEPTOR
- APA LAND CLASS - INDUSTRIAL USE
- APA LAND CLASS - MODERATE INTENSITY
- APA LAND CLASS - RURAL USE
- NYSDEC LAND CLASS - WILDERNESS FOREST
- NYSDEC LAND CLASS - RESOURCE MANAGEMENT
- NYSDEC LAND CLASS - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM
- TARGET AREA

SCALE IN FEET
0 500 1000 2000

N

DRAWING NOTES:

1. CONTOUR INTERVAL = 5' MINOR, 25' MAJOR.
2. HORIZONTAL DATUM: NAD83 STATE PLAN, NEW YORK EAST, FEET
   VERTICAL DATUM: NAVD88, FEET AMSL
3. TOPOGRAPHY BASED ON NYS CLEARINGHOUSE 2017 METADATA. THE ON AERIAL IMAGERY IS FROM THE NYS CLEARINGHOUSE WEBSITE.
4. PROPERTY LINE BY PROVIDED FROM THE ESSEX COUNTY TAX PARCELS.

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SITE OVERVIEW MAP

UNCONVENTIONAL CONCEPTS, INC.

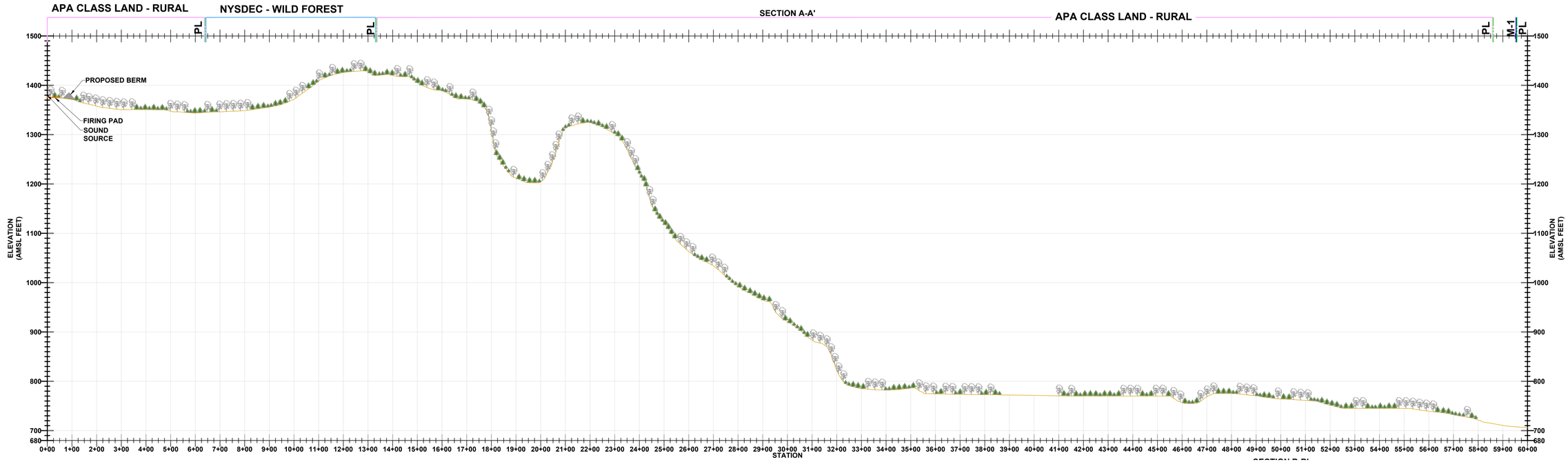
TOWN OF LEWIS — ESSEX COUNTY, NY

BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 1

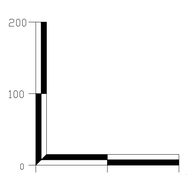
SHEET 01 OF 05

Q:\NY-TROY-HH\PointClouds\2UC\Mapping\CADs\2024-11-11 UCI Site Overview Map & Sections.dwg, 11/18/2024 5:32:15 PM, DWG To PDF.pc3



LEGEND:

- PROPERTY LINES
- SOUND LEVEL MONITORING LOCATIONS
- RESIDENTIAL RECEPTOR
- APA LAND CLASS - MODERATE INTENSITY
- APA LAND CLASS - RURAL USE
- NYSDEC LAND CLASS - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM



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VERTICAL SCALE: 1" = 100'

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SITE OVERVIEW MAP - SECTIONS

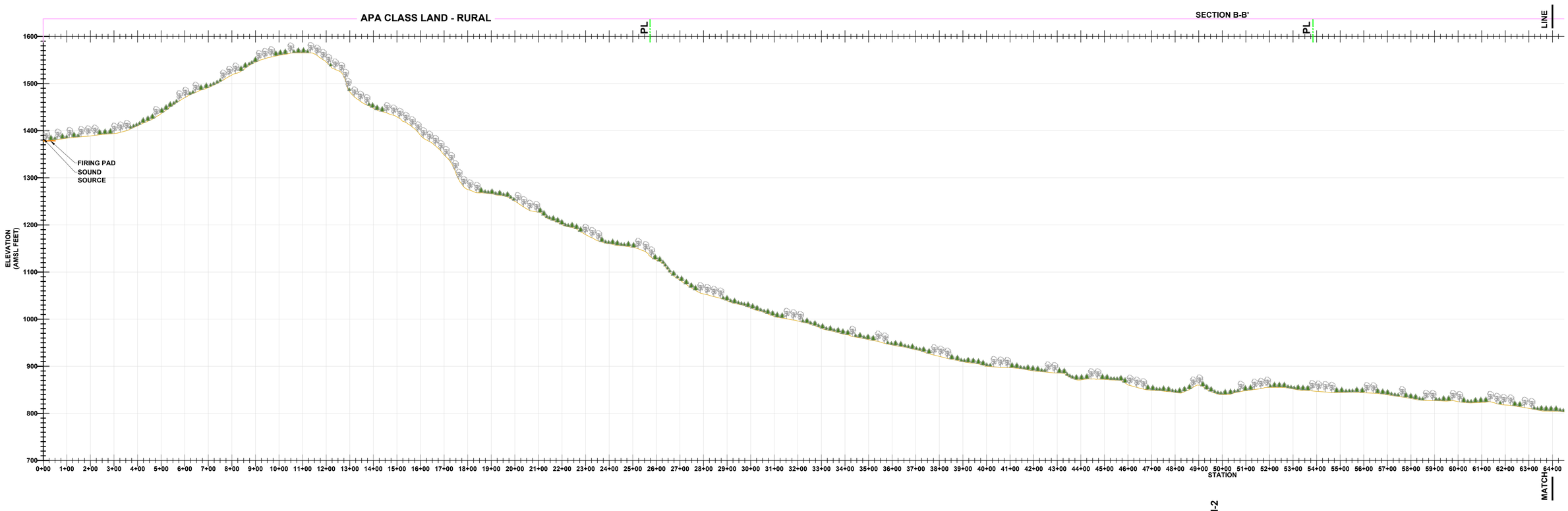
UNCONVENTIONAL CONCEPTS, INC.

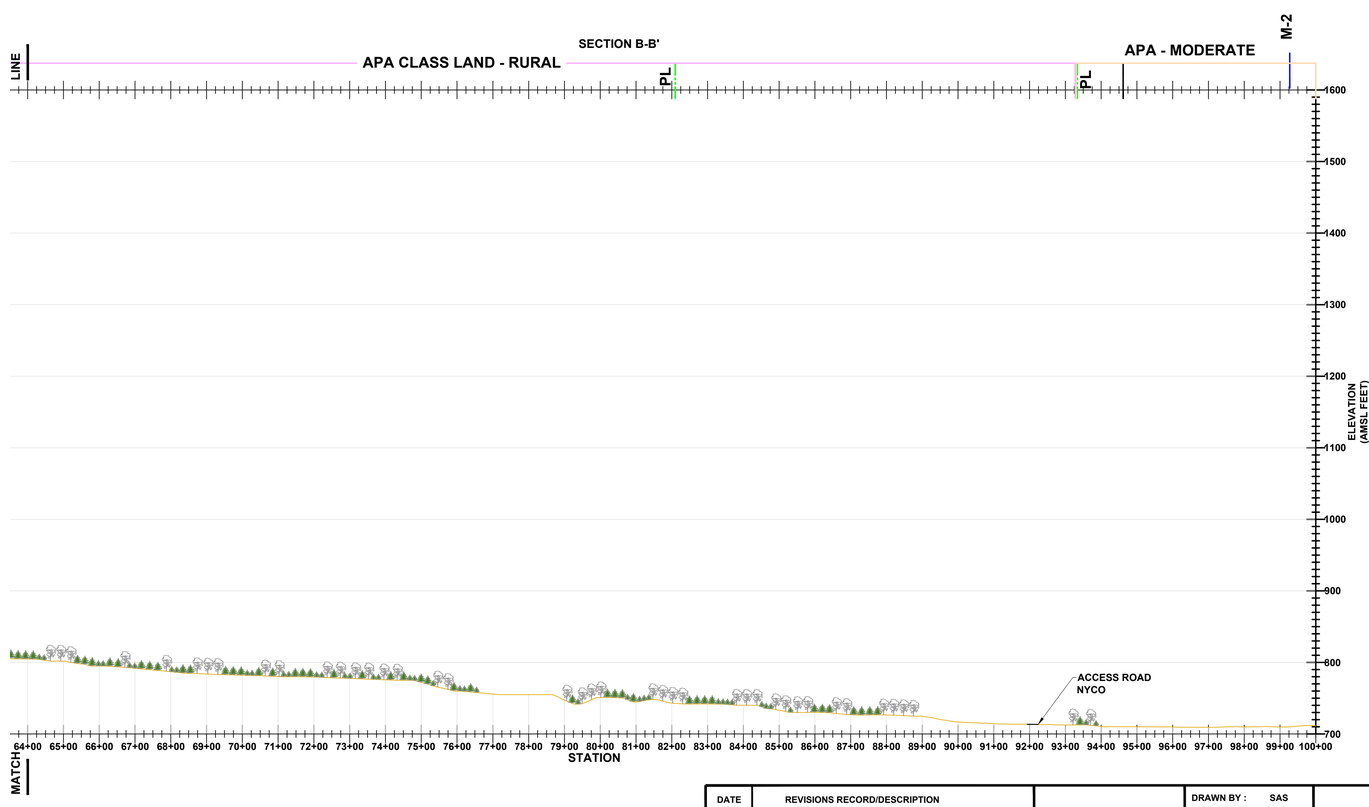
TOWN OF LEWIS — ESSEX COUNTY, NY

BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 1

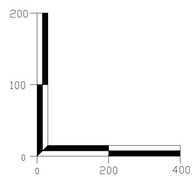
SHEET 02 OF 05





LEGEND:

- PROPERTY LINES
- SOUND LEVEL MONITORING LOCATIONS
- RESIDENTIAL RECEPTOR
- APA LAND CLASS - MODERATE INTENSITY
- APA LAND CLASS - RURAL USE
- NYSDEC LAND CLASS - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM



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VERTICAL SCALE: 1" = 100'

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SITE OVERVIEW MAP - SECTIONS

UNCONVENTIONAL CONCEPTS, INC.

TOWN OF LEWIS — ESSEX COUNTY, NY

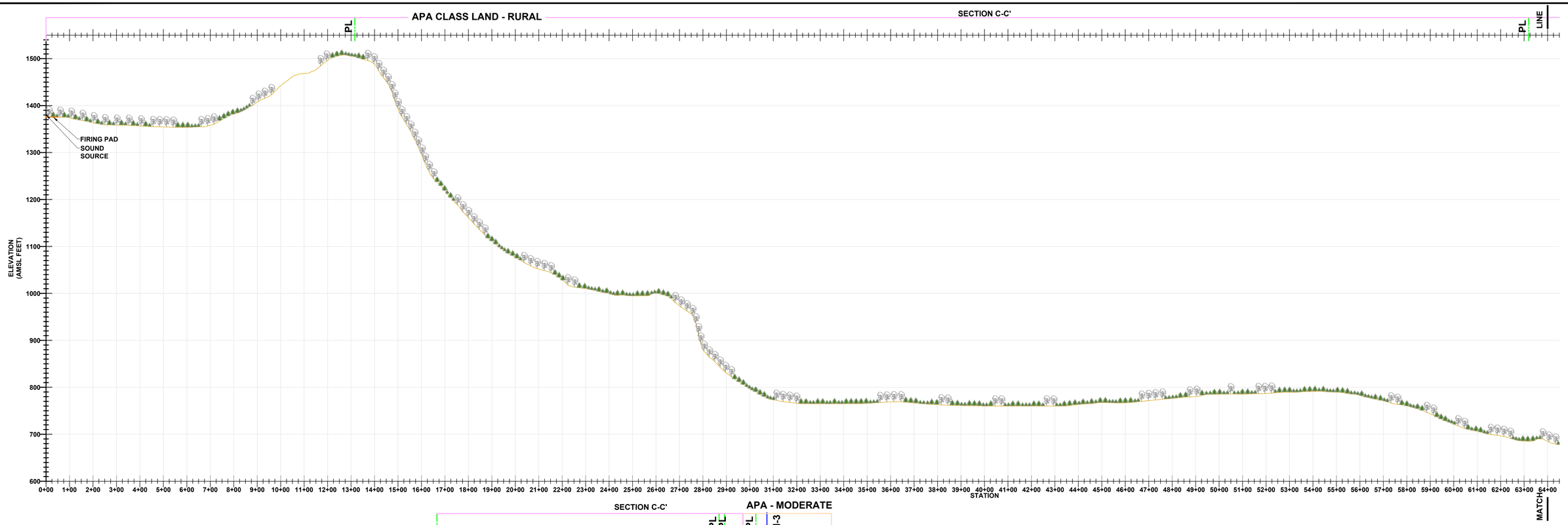
BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 1

SHEET 03 OF 05

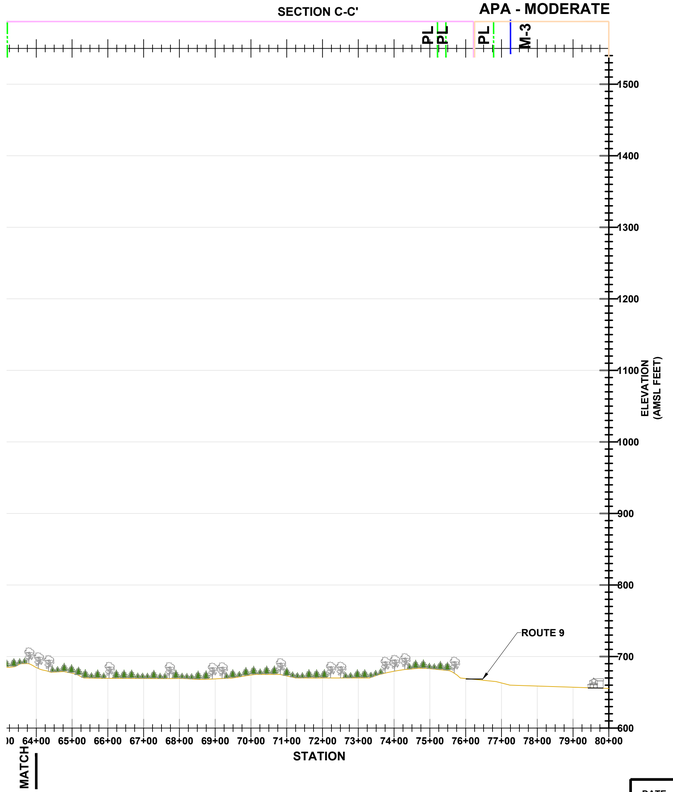
APA CLASS LAND - RURAL

SECTION C-C'



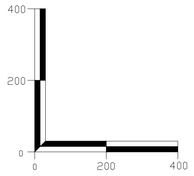
APA - MODERATE

SECTION C-C'



LEGEND:

- PROPERTY LINES
- SOUND LEVEL MONITORING LOCATIONS
- RESIDENTIAL RECEPTOR
- APA LAND CLASS - MODERATE INTENSITY
- APA LAND CLASS - RURAL USE
- NYSDEC LAND CLASS - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM



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VERTICAL SCALE: 1" = 200'

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SITE OVERVIEW MAP - SECTIONS

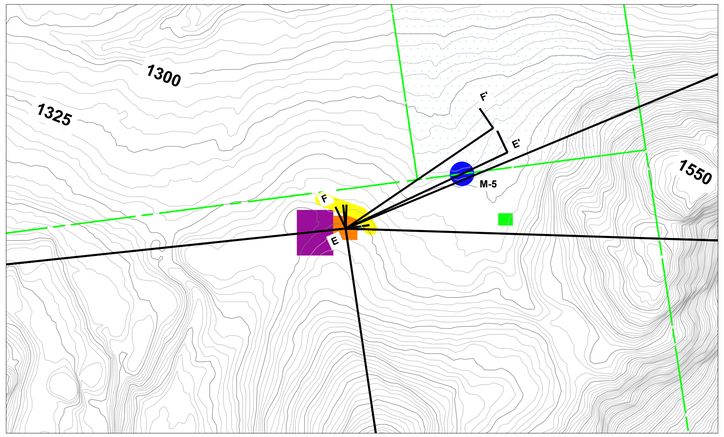
UNCONVENTIONAL CONCEPTS, INC.

TOWN OF LEWIS — ESSEX COUNTY, NY

BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 1

SHEET 04 OF 05



PLAN VIEW
SECTIONS E-E' & F-F'
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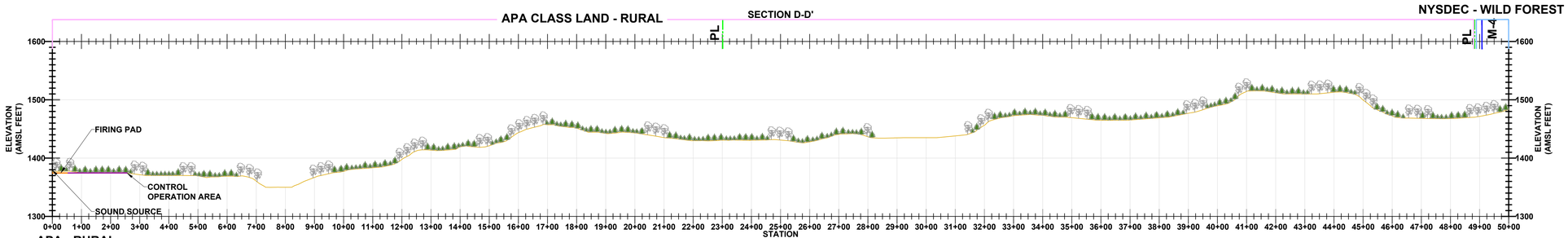
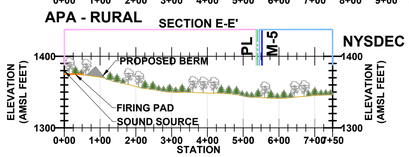
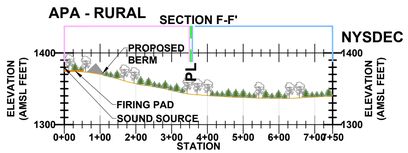
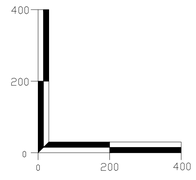






LEGEND:

- PROPERTY LINES
- SOUND LEVEL MONITORING LOCATIONS
- RESIDENTIAL RECEPTOR
- APA LAND CLASS - MODERATE INTENSITY
- APA LAND CLASS - RURAL USE
- NYSDEC LAND CLASS - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM



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VERTICAL SCALE: 1" = 200'

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DATE :	11-11-2024

SITE OVERVIEW MAP - SECTIONS

UNCONVENTIONAL CONCEPTS, INC.

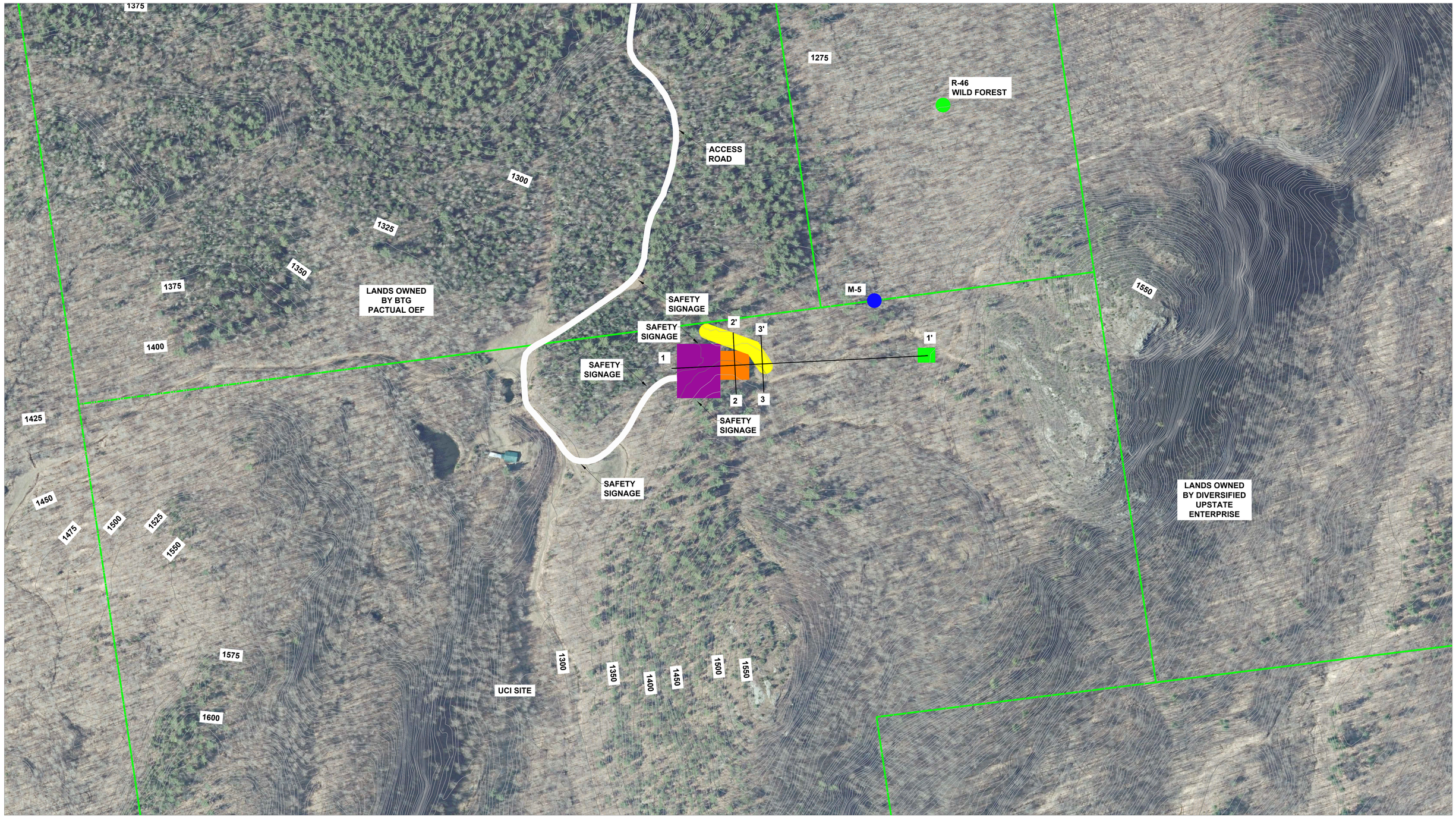
TOWN OF LEWIS — ESSEX COUNTY, NY

BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 1

SHEET 05 OF 05

FIGURE 2 – SITE MAP



LEGEND:

- PROPERTY LINES
- MONITORING LOCATION PROPOGATED SOUND LEVEL
- RECEPTOR - WILD FOREST
- CONTROL OPERATION AREA
- FIRING PAD
- PROPOSED 13 FT BERM
- TARGET AREA

SCALE IN FEET
0 75 150 300

N

DRAWING NOTES:

1. CONTOUR INTERVAL = 5' MINOR, 25' MAJOR.
2. HORIZONTAL DATUM: NAD83 STATE PLAN, NEW YORK EAST, FEET
   VERTICAL DATUM: NAVD88, FEET AMSL
3. TOPOGRAPHY BASED ON NYS CLEARINGHOUSE 2017 METADATA. THE ON AERIAL IMAGERY IS FROM THE NYS CLEARINGHOUSE WEBSITE.
4. PROPERTY LINE BY PROVIDED FROM THE ESSEX COUNTY TAX PARCELS.

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THIS DRAWING IS NOT TO BE USED FOR ENGINEERING PURPOSES

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SITE MAP

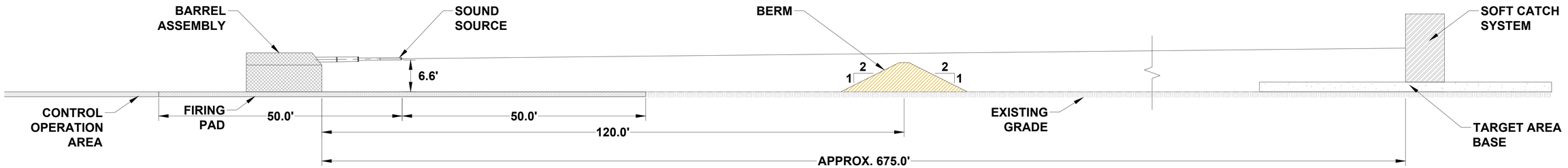
UNCONVENTIONAL CONCEPTS, INC.

TOWN OF LEWIS — ESSEX COUNTY, NY

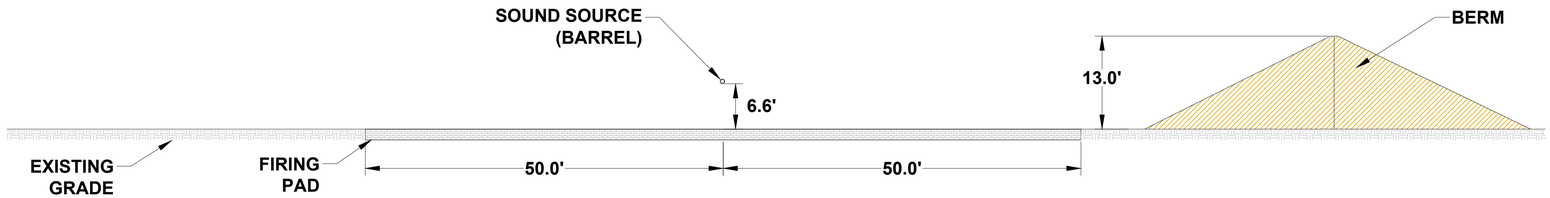
Bowman
179 RIVER ST.
TROY, NY 12180
(518) 270-1620
WWW.BOWMAN.COM

FIGURE 2

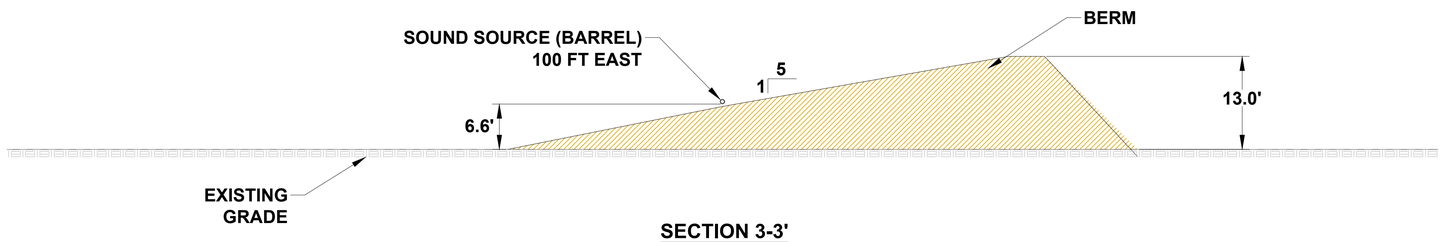
SHEET 01 OF 02



SECTION 1-1'



SECTION 2-2'



SECTION 3-3'

DRAWING NOTES:
1. CONTOUR INTERVAL = 5' MINOR, 25' MAJOR.

2. HORIZONTAL DATUM: NAD83 STATE PLAN, NEW YORK EAST, FEET
VERTICAL DATUM: NAVD88, FEET AMSL

3. TOPOGRAPHY BASED ON NYS CLEARINGHOUSE 2017 METADATA. THE ON AERIAL IMAGERY IS FROM THE NYS CLEARINGHOUSE WEBSITE.

4. PROPERTY LINE BY PROVIDED FROM THE ESSEX COUNTY TAX PARCELS.

SCALE IN FEET
0 5 10 20

DATE	REVISIONS RECORD/DESCRIPTION
	1
	2
	3
	4
	5
	6

DRAWN BY :	SAS
DESIGN BY :	SAS
CHECK BY :	TRT
PROJ. NO :	362.00
SCALE :	AS SHOWN
DATE :	11-11-2024

SITE MAP - SECTIONS

UNCONVENTIONAL CONCEPTS, INC.

TOWN OF LEWIS — ESSEX COUNTY, NY

BOWMAN CONSULTING, ENGINEERING, LAND SURVEYING AND LANDSCAPE ARCHITECTURE

FIGURE 2

SHEET 02 OF 02

FIGURE 3 – SOUND PROPAGATION MAP
NO SOUND MITIGATION BERM

FIGURE 3 - SOUND PROPOGATION MAP
NO SOUND MITIGATION BERM

615000 m

225000 m

N

2 miles

R-17
Gibson

R-18
Drummond

R-16
Williams

R-15
Ero

R-14
Bigelow

R-13
Stone

Canavan

R-10
Siegel

R-11
Canavan

R-8
Marty

Hooper

R-1
Pulsifer

M-1 75 dB(A)

R-2
Benway

R-6
Cross

R-9
Connor

R-3
Benway

R-4
Rock

R-5
Wimett

R-46
Wild Forest

R-45
Wild Forest

M-5 107dB(A)

Sound Source

R-19
Bigelow

R-20
Colegrove

M-3 73 dB(A)

R-22
Mitchell

M-4 79 dB(A)

R-21
Laughin

R-47
Wild Forest

R-23
Mitchell

R-25
Ingram

R-24
Mitchell

610000 m

R-26
Salva

R-28

R-27
Smith

R-30
Ryan

R-48
Wild Forest

R-49
Wild Forest

R-31
Cassavaugh

R-33
OKusky

R-32
Ashline

R-34
Anderson

R-36
Huckins

R-37

R-38
Moore

R-39
Sullivan

R-40
Crowningshield

R-41
Stone

R-44
Pulsifer

R-42
Pulsifer

M-2 71 dB(A)

R-43
Stevens

0 ft 1000 ft 2000 ft 3000 ft 4000 ft 5000 ft 6000 ft 7000 ft 8000 ft

LEGEND

- APA Land Class - Industrial Use
- APA Land Class - Low Intensity
- APA Land Class - Moderate Intensity
- APA Land Class - Rural Use
- Control Operation Area
- Firing Pad
- NYSDEC Land Class - Resource Management
- NYSDEC Land Class - Wild Forest
- NYSDEC Land Class - Wilderness
- Property Bondary
- Surface Water
- Target Area
- Two Mile Radius from Firing Pad
- 45 DB(A) Sound Pressure Level
- 50 DB(A) Sound Pressure Level
- 55 DB(A) Sound Pressure Level
- 60 DB(A) Sound Pressure Level
- 65 DB(A) Sound Pressure Level
- 70 DB(A) Sound Pressure Level
- 75 DB(A) Sound Pressure Level
- 80 DB(A) Sound Pressure Level
- 85 DB(A) Sound Pressure Level
- 90 DB(A) Sound Pressure Level
- 95 DB(A) Sound Pressure Level
- 100 DB(A) Sound Pressure Level
- 105 DB(A) Sound Pressure Level
- 110 DB(A) Sound Pressure Level
- 115 DB(A) Sound Pressure Level
- 120 DB(A) Sound Pressure Level
- 125 DB(A) Sound Pressure Level
- 130 DB(A) Sound Pressure Level
- Monitoring Location Propogated Sound Level
- Receptor - Wild Forest
- Residential Receptor
- Sound Source

225000 m

FIGURE 4 – SOUND PROPAGATION MAP
13FT. SOUND MITIGATION BERM INSTALLED

FIGURE 4 - SOUND PROPOGATION MAP
13FT. SOUND MITIGATION BERM INSTALLED

615000 m

225000 m

N

2 miles

R-17 Gibson
R-18 Drummond
R-16 Williams
R-15 Ero
R-14 Bigelow
R-13 Stone
Canavan
R-10 Siegel
R-11 Canavan
R-8 Marty
Hooper
R-1 Pulsifer
R-2 Benway
M-1 67 dB(A)
R-6 Cross
R-9 Connor
R-3 Benway
R-4 Rock
R-5 Wimett
R-46 Wild Forest
R-45 Wild Forest
M-5 100dB(A)
R-19 Bigelow
Sound Source
M-3 73 dB(A)
R-20 Colegrove
M-4 79 dB(A)
R-22 Mitchell
R-21 Laughin
R-47 Wild Forest
R-23 Mitchell
R-25 Ingram
R-24 Mitchell
R-26 Salva
R-28
R-27 Smith
R-30 Ryan
R-48 Wild Forest
R-49 Wild Forest
R-31 Cassavaugh
R-33 OKusky
R-32 Ashline
R-34 Anderson
R-36 Huckins
R-38 Moore
R-37
R-39 Sullivan
R-40 Crowningshield
R-41 Stone
R-44 Pulsifer
R-42 Pulsifer
M-2 71 dB(A)
R-43 Stevens

610000 m

0 ft 1000 ft 2000 ft 3000 ft 4000 ft 5000 ft 6000 ft 7000 ft 8000 ft

LEGEND

- APA Land Class - Industrial Use
- APA Land Class - Low Intensity
- APA Land Class - Moderate Intensity
- APA Land Class - Rural Use
- Control Operation Area
- Firing Pad
- NYSDEC Land Class - Resource Management
- NYSDEC Land Class - Wild Forest
- NYSDEC Land Class - Wilderness
- Property Bondary
- Surface Water
- Target Area
- Two Mile Radius from Firing Pad
- 50 DB(A) Sound Pressure Level
- 55 DB(A) Sound Pressure Level
- 60 DB(A) Sound Pressure Level
- 65 DB(A) Sound Pressure Level
- 70 DB(A) Sound Pressure Level
- 75 DB(A) Sound Pressure Level
- 80 DB(A) Sound Pressure Level
- 85 DB(A) Sound Pressure Level
- 90 DB(A) Sound Pressure Level
- 95 DB(A) Sound Pressure Level
- 100 DB(A) Sound Pressure Level
- 105 DB(A) Sound Pressure Level
- 110 DB(A) Sound Pressure Level
- 115 DB(A) Sound Pressure Level
- 120 DB(A) Sound Pressure Level
- 125 DB(A) Sound Pressure Level
- 130 DB(A) Sound Pressure Level
- Monitoring Location Propogated Sound Level
- Receptor - Wild Forest
- Residential Receptor
- Sound Source

FIGURE 5 – SOUND PROPAGATION MAP
HAUL TRUCK

FIGURE 5 - SOUND PROPOGATION MAP
HAUL TRUCK

615000 m
225000 m
610000 m

N

2 miles

Sound Source
Sound Source
Sound Source

M-1 44 dB(A)
M-2 20 dB(A)
M-3 33 dB(A)
M-4 33 dB(A)
M-5 60 dB(A)

Access Road To Site

R-1 Pulsifer
R-2 Benway
R-3 Benway
R-4 Rock
R-5 Wimett
R-6 Cross
R-8 Marty
R-9 Connor
R-10 Siegel
R-11 Canavan
R-13 Stone
R-14 Bigelow
R-15 Ero
R-16 Williams
R-17 Gibson
R-18 Drummond
R-19 Bigelow
R-20 Colegrove
R-21 Laughin
R-22 Mitchell
R-23 Mitchell
R-24 Mitchell
R-25 Ingram
R-26 Salva
R-27 Smith
R-28
R-30 Ryan
R-31 Cassavaugh
R-32 Ashline
R-33 OKusky
R-34 Anderson
R-36 Huckins
R-37
R-38 Moore
R-39 Sullivan
R-40 Crowningshield
R-41 Stone
R-42 Pulsifer
R-43 Stevens
R-44 Pulsifer
R-45 Wild Forest
R-46 Wild Forest
R-47 Wild Forest
R-48 Wild Forest
R-49 Wild Forest
Hooper
Canavan

0 ft 1000 ft 2000 ft 3000 ft 4000 ft 5000 ft 6000 ft 7000 ft 8000 ft

LEGEND

- APA Land Class - Industrial Use
- APA Land Class - Low Intensity
- APA Land Class - Moderate Intensity
- APA Land Class - Rural Use
- Control Operation Area
- Firing Pad
- NYSDEC Land Class - Resource Management
- NYSDEC Land Class - Wild Forest
- NYSDEC Land Class - Wilderness
- Property Bondary
- Surface Water
- Target Area
- Two Mile Radius from Firing Pad
- 20 dB(A) Sound Pressure Level
- 25 dB(A) Sound Pressure Level
- 30 dB(A) Sound Pressure Level
- 35 dB(A) Sound Pressure Level
- 40 dB(A) Sound Pressure Level
- 45 dB(A) Sound Pressure Level
- 50 dB(A) Sound Pressure Level
- 55 dB(A) Sound Pressure Level
- 60 dB(A) Sound Pressure Level
- 65 dB(A) Sound Pressure Level
- 70 dB(A) Sound Pressure Level
- 75 dB(A) Sound Pressure Level
- 80 dB(A) Sound Pressure Level
- 85 dB(A) Sound Pressure Level
- acess road to site
- Monitoring Location Propogated Sound Level
- Receptor - Wild Forest
- Residential Receptor
- Sound Source

TABLE 3 – Sound Propagation Model Comparison to Straight-line Projection Method

Column	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Receiver Name	Source Name	Distance to source (m)	Frequency (Hz)	Sound Power Level dB	Distance Attenuation db	Atmospheric Absorption dB	Ground Effect dB	Barrier Attenuation dB (total)	A - Weighting dB	Modeled Sound Pressure Level dB(A)	Modeled Sound Pressure Level Distance Attenuation + Weighting Only dB(A)	Total Modeled Sound Pressure Level dB(A)	Total Modeled Sound Pressure Level Distance Attenuation + Weighting Only dB(A)	Straight-line projection Sound Pressure Levels dB(A)
M-1	155 mm Howitzer Barrel Assembly	1815	31.5	179.1	-76.2	0.0	5.8	-10.3	-39.4	59.1	63.5	67	87	87
		1815	63	175.3	-76.2	-0.2	5.8	-12.7	-26.2	65.9	72.9			
		1815	125	164.5	-76.2	-0.6	-5.5	-9.8	-16.1	56.3	72.2			
		1815	250	149.1	-76.2	-2.1	-7.4	-10.8	-8.6	44.1	64.3			
		1815	500	160	-76.2	-5.1	-3.3	-17.8	-3.2	54.5	80.6			
		1815	1000	158.7	-76.2	-9.0	1.2	-24.0	0.0	50.7	82.5			
		1815	2000	155.2	-76.2	-16.4	1.8	-25.0	1.2	40.6	80.2			
		1815	4000	151.9	-76.2	-41.6	1.8	-25.0	1.0	11.9	76.7			
		1815	8000	147.6	-76.2	-139.1	1.8	-25.0	-1.1	-92.0	70.3			
		1815	16000	144.9	-76.2	-501.5	1.8	-25.0	-6.6	-462.6	62.1			
M-2	155 mm Howitzer Barrel Assembly	3026	31.5	179.1	-80.6	-0.1	5.9	-4.8	-39.4	60.1	59.1	71	83	83
		3026	63	175.3	-80.6	-0.3	5.9	-4.9	-26.2	69.3	68.5			
		3026	125	164.5	-80.6	-1.0	-5.5	0.0	-16.1	61.3	67.8			
		3026	250	149.1	-80.6	-3.4	-7.4	0.0	-8.6	49.1	59.9			
		3026	500	160	-80.6	-8.5	-3.3	-2.2	-3.2	62.3	76.2			
		3026	1000	158.7	-80.6	-15.1	1.2	-6.0	0.0	58.2	78.1			
		3026	2000	155.2	-80.6	-27.3	1.8	-6.9	1.2	43.3	75.8			
		3026	4000	151.9	-80.6	-69.3	1.8	-8.4	1.0	-3.7	72.3			
		3026	8000	147.6	-80.6	-231.8	1.8	-10.3	-1.1	-174.5	65.9			
		3026	16000	144.9	-80.6	-835.8	1.8	-12.7	-6.6	-789.0	57.7			
M-3	155 mm Howitzer Barrel Assembly	2355	31.5	179.1	-78.44	-0.1	5.9	-5.0	-39.4	62.1	61.3	73	85	85
		2355	63	175.3	-78.44	-0.2	5.9	-5.1	-26.2	71.2	70.7			
		2355	125	164.5	-78.44	-0.8	-5.5	0.0	-16.1	63.7	70.0			
		2355	250	149.1	-78.44	-2.7	-7.4	0.0	-8.6	52.0	62.1			
		2355	500	160	-78.44	-6.6	-3.3	-3.8	-3.2	64.7	78.4			
		2355	1000	158.7	-78.44	-11.7	1.2	-8.5	0.0	61.2	80.3			
		2355	2000	155.2	-78.44	-21.2	1.8	-10.5	1.2	48.0	78.0			
		2355	4000	151.9	-78.44	-54.0	1.8	-12.9	1.0	9.4	74.5			
		2355	8000	147.6	-78.44	-180.5	1.8	-15.6	-1.1	-126.2	68.1			
		2355	16000	144.9	-78.44	-650.6	1.8	-18.4	-6.6	-607.4	59.9			
M-4	155 mm Howitzer Barrel Assembly	1496	31.5	179.1	-74.6	0.0	5.8	-4.8	-39.4	66.1	65.1	79	89	89
		1496	63	175.3	-74.6	-0.1	5.8	-4.8	-26.2	75.4	74.5			
		1496	125	164.5	-74.6	-0.5	-5.5	0.0	-16.1	67.8	73.8			
		1496	250	149.1	-74.6	-1.7	-7.4	0.0	-8.6	56.8	65.9			
		1496	500	160	-74.6	-4.2	-3.3	-1.5	-3.2	73.2	82.2			
		1496	1000	158.7	-74.6	-7.5	1.2	-4.8	0.0	73.0	84.1			
		1496	2000	155.2	-74.6	-13.7	1.7	-4.8	1.2	65.1	81.8			
		1496	4000	151.9	-74.6	-34.7	1.7	-4.8	1.0	40.6	78.3			
		1496	8000	147.6	-74.6	-116.0	1.7	-4.8	-1.1	-47.2	71.9			
		1496	16000	144.9	-74.6	-418.3	1.7	-4.8	-6.6	-357.7	63.7			

M-5	**155 mm Howitzer Barrel Assembly**	170	31.5	179.1	-55.6	0.0	4.1	-4.9	-39.4	83.4	84.1	**100**	**108**	**108**
		170	63	175.3	-55.6	0.0	4.1	-5.0	-26.2	92.7	93.5			
		170	125	164.5	-55.6	-0.1	-0.4	-4.8	-16.1	87.6	92.8			
		170	250	149.1	-55.6	-0.2	-7.6	0.0	-8.6	77.1	84.9			
		170	500	160	-55.6	-0.5	-3.6	-2.6	-3.2	94.5	101.2			
		170	1000	158.7	-55.6	-0.9	0.7	-7.3	0.0	95.7	103.1			
		170	2000	155.2	-55.6	-1.5	1.2	-8.8	1.2	91.7	100.8			
		170	4000	151.9	-55.6	-3.9	1.2	-10.9	1.0	83.7	97.3			
		170	8000	147.6	-55.6	-13.0	1.2	-13.4	-1.1	65.8	90.9			
		170	16000	144.9	-55.6	-46.9	1.2	-16.1	-6.6	21.0	82.7			
Wild Forest Property Corner (R-46)	**155 mm Howitzer Barrel Assembly**	107	31.5	179.1	-51.5	0.0	3.0	-5.0	-39.4	86.2	88.2	**102**	**112**	**112**
		107	63	175.3	-51.5	0.0	3.0	-5.3	-26.2	95.3	97.6			
		107	125	164.5	-51.5	0.0	-0.3	-5.4	-16.1	91.1	96.9			
		107	250	149.1	-51.5	-0.1	-7.1	0.0	-8.6	81.8	89.0			
		107	500	160	-51.5	-0.3	-3.5	-4.5	-3.2	97.0	105.3			
		107	1000	158.7	-51.5	-0.5	0.4	-9.9	0.0	97.2	107.2			
		107	2000	155.2	-51.5	-1.0	0.9	-12.2	1.2	92.6	104.9			
		107	4000	151.9	-51.5	-2.4	0.9	-14.8	1.0	85.0	101.4			
		107	8000	147.6	-51.5	-8.1	0.9	-17.6	-1.1	70.1	95.0			
		107	16000	144.9	-51.5	-29.3	0.9	-20.0	-6.6	38.4	86.8			

APPENDICES

APPENDIX A –
NYSDEC – ASSESSING AND MITIGATING NOISE IMPACTS

Assessing and Mitigating Noise Impacts

New York State
Department of Environmental Conservation

PROGRAM POLICY	**Department ID: DEP-00-1**	**Program ID: n/a**
Issuing Authority: Environmental Conservation Law Articles 3, 8, 23, 27 Name: Jeffrey Sama Title: Director Signature: /S/ Date: 10/6/00 Issuance Date: October 6, 2000 Revised: February 2, 2001	**Originating Unit: Division of Environmental Permits** Office/Division: Environmental Permits Unit: Phone: (518) 402-9167 Latest Review Date (Office Use):	

Abstract: Facility operations regulated by the Department of Environmental Conservation located in close proximity to other land uses can produce sound that creates significant noise impacts for proximal sound receptors. This policy and guidance presents noise impact assessment methods, examines the circumstances under which sound creates significant noise impacts, and identifies avoidance and mitigative measures to reduce or eliminate noise impacts.

Related References: See references pages 27 and 28.

I. PURPOSE[1]

This policy is intended to provide direction to the staff of the Department of Environmental Conservation for the evaluation of sound levels and characteristics (such as pitch and duration) generated from proposed or existing facilities. This guidance also serves to identify when noise levels may cause a significant environmental impact and gives methods for noise impact assessment, avoidance, and reduction measures. These methods can serve as a reference to applicants preparing environmental assessments in support of an application for a permit. Additionally, this guidance explains the Department's regulatory authority for undertaking noise evaluations and for imposing conditions for noise mitigation measures in the agency's approval

[1] A Program Policy Memorandum is designed to provide guidance and clarify program issues for Division staff to ensure compliance with statutory and regulatory requirements. It provides assistance to New York State Department of Environmental Conservation (DEC) staff and the regulated community in interpreting and applying regulations and statutes to assure that program uniformity is attained throughout the State. Nothing set forth in a Program Policy Memorandum prevents DEC staff from varying from that guidance as specific circumstances may dictate, provided the staff's actions comply with applicable statutory and regulatory requirements. As this guidance document is not a fixed rule, it does not create any enforceable right by any party using the Program Policy Memorandum.

of permits for various types of facilities pursuant to regulatory program regulations and the State Environmental Quality Review Act (SEQR).

II. BACKGROUND

Noise is defined as any loud, discordant or disagreeable sound or sounds. More commonly, in an environmental context, noise is defined simply as unwanted sound. Certain activities inherently produce sound levels or sound characteristics that have the potential to create noise. The sound generated by proposed or existing facilities may become noise due to land use surrounding the facility. When lands adjoining an existing or proposed facility contain residential, commercial, institutional or recreational uses that are proximal to the facility, noise is likely to be a matter of concern to residents or users of adjacent lands.

A. Sources of Noise Generation

The three major categories of noise sources associated with facilities are (1) fixed equipment or process operations; (2) mobile equipment or process operations; and (3) transport movements of products, raw material or waste. The fixed plant may include a very wide range of equipment including: generators; pumps; compressors; crushers of plastics, stone or metal; grinders; screens; conveyers; storage bins; or electrical equipment. Mobile operations may include: drilling; haulage; pug mills; mobile treatment units; and service operations. Transport movements may include truck traffic within the operation, loading and unloading trucks and movement in and out of the facility. Any or all of these activities may be in operation at any one time. Singular or multiple effects of sound generation from these operations may constitute a potential source of noise.

B. Potential for Adverse Impacts

Numerous environmental factors determine the level or perceptibility of sound at a given point of reception. These factors include: distance from the source of sound to receptor; surrounding terrain; ambient sound level; time of day; wind direction; temperature gradient; and relative humidity. The characteristics of a sound are also

important determining factors for considering it as noise. The amplitude (loudness), frequency (pitch), impulse patterns and duration of sound all affect the potential for a sound to be a noise. The combination of sound characteristics, environmental factors and the physical and mental sensitivity of a receptor to a sound determine whether or not a sound will be perceived as a noise. This guidance uses these factors in assessing the presence of noise and the significance of its impacts. It relies upon qualitative and quantitative sound evaluation techniques and sound pressure level impact modeling presented in accepted references on the subject.

C. Mitigation

Mitigation refers to actions that will be taken to reduce the effects of noise or the noise levels on a receptor. Adverse noise effects generated by a facility can be avoided or reduced at the point of generation thereby diminishing the effects of the noise at the point of reception. This guidance identifies various mitigation techniques and their proper application either at the source of noise generation or on a facility's property. Alternative construction or operational methods, equipment maintenance, selection of alternative equipment, physical barriers, siting of activities, set backs, and established hours of construction or operation, are among the techniques that can successfully avoid or reduce adverse noise effects.

D. Decision Making

When an assessment of the potential for adverse noise impacts indicates the need for noise mitigation, it is preferred that specifications for such measures be incorporated in a noise analysis and in the applicant's work or operational plan necessary for a complete application. Presenting a plan that incorporates effective noise mitigation provisions facilitates the Department's technical and environmental review and minimizes or negates the imposition of permit conditions by the Department. Adherence to these plans becomes a condition of a permit.

Noise avoidance and mitigation measures may also be imposed directly as conditions of permit issuance. This guidance will review the statutory authority under which the Department can require the mitigation of noise effects.

III. POLICY

In the review of an application for a permit, the Department of Environmental Conservation is to evaluate the potential for adverse impacts of sound generated and emanating to receptors outside of the facility or property. When a sound level evaluation indicates that receptors may experience sound levels or characteristics that produce significant noise impacts or impairment of property use, the Department is to require the permittee or applicant to employ reasonable and necessary measures to either eliminate or mitigate adverse noise effects. Options to be used to fulfill this guidance should be implemented within the existing regulatory and environmental review framework of the agency.

Regulatory authority for assessing and controlling noise effects are contained in both SEQR and specific Department program regulations. Specific regulatory references are as follows:

Section 3-0301(1)(i) of the Environmental Conservation Law (ECL) states that the commissioner shall have the power to: "i. Provide for prevention and abatement of all water, land and air pollution including but not limited to that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids."

To comply with Article 8 of the ECL and 6 NYCRR Part 617, State Environmental Quality Review Act, consideration of all relevant environmental issues must be undertaken in making a determination of environmental significance. Noise impact potential is one of many potential issues for consideration in a SEQR review.

Environmental Conservation Law (ECL) Article 23, Title 27, Mined Land Reclamation Law (MLRL), requires applicants for permits to prepare and submit a mined land use plan to the Department for approval. The plan must describe, "the applicant's mining method and measures

to be taken to minimize adverse environmental impacts resulting from the mining operation." The provisions to be incorporated in a Mined Land Use Plan, as specified in 6 NYCRR Section 422.2, include the control of noise as a component of the plan.

The solid waste regulations at 6 NYCRR Subdivision 360-1.14(p), establish A-weighted decibel levels that are not to be exceeded at the property line of a facility.

The Division of Air Resources has regulations in 6 NYCRR Parts 450 through 454 that regulate the allowable sound level limits on certain motor vehicles. The statutory authority for these regulations is found in the New York State Vehicle and Traffic Law, Article 10, Section 386.

This guidance does not supercede any local noise ordinances or regulations.

IV. RESPONSIBILITY

The environmental analyst, acting as project manager for the review of applications for permits or permit modifications and working in concert with the program specialist, is responsible for ensuring that sound generation and noise emanating from proposed or existing facilities are properly evaluated. For new permits or significantly modified permits, there should be a determination as to the potential for noise impacts, and establishment of the requirements for noise impact assessment to be included in the application for permit. Where the Department is lead agency, the analyst is responsible for making a determination of significance pursuant to SEQR with respect to potential noise impacts and include documentation for such determination.

Where impacts are to be avoided or reduced through mitigation measures, the analyst, or where there are program requirements to address noise, the program specialist, should determine the effectiveness and feasibility of those measures and ensure that the permit conditions contain specific details for such measures. It should also be determined if additional measures to control noise are to be imposed as a condition of permitting. Appropriate permit language for the permit conditions should be developed by the program specialist and the analyst. The results of noise impact evaluations and the effectiveness of mitigation measures

shall be incorporated into SEQR documents and, where necessary, permit conditions shall be placed in final permits to ensure effective noise control.

When it is determined that potential noise effects, as well as other issues, warrant evaluation of impacts and mitigation measures in a Draft Environmental Impact Statement (EIS) prepared pursuant to SEQR, the environmental analyst with the Division of Environmental Permits assumes responsibility for determining the level of evaluation needed to assess sound level generation, noise effects, and mitigation needs and feasibility.

For existing facilities, the program specialist will determine the need for additional mitigation measures to control noise effects either in response to complaints or other changes in circumstances such as new noise from existing facilities or a change in land-use proximal to the facility.

The applicant or their agent, in preparing an application for a permit and supporting documentation, is responsible for assessing the potential noise impacts on area receptors. When potential adverse noise impacts are identified, the applicant should incorporate noise avoidance and reduction measures in the construction or operating plans. The applicant's submittal should also assess the effectiveness of proposed mitigation measures in eliminating adverse noise reception. Where noise effects are determined to be a reason in support of a SEQR positive declaration, the applicant shall assess noise impacts, avoidance, and mitigation measures in a Draft EIS using methodologies acceptable to this Department.

V. PROCEDURE

The intent of this section is to: introduce terms related to noise analyses; describe some of the various methods used to determine the impacts of sound pressure levels on receptors; identify some of the various attenuators of noise; and list some of the mitigative techniques that can be used to reduce the effects of noise on a receptor. At the end of the section three levels of analysis are described. The first level determines the potential for adverse noise impacts based on noise characteristics and sound pressure increases solely on noise attenuation over distance between the source and receptor of the noise. The second level factors other considerations such as topography and noise abatement measures in determining if adverse

noise impacts will occur. The third level evaluates noise abatement alternatives and their effectiveness in avoiding or reducing noise impacts.

The environmental effects of sound and human perceptions of sound can be described in terms of four characteristics:

1. Sound Pressure Level (SPL may also be designated by the symbol L_p) or perceived loudness is expressed in decibels (dB) or A-weighted decibel scale dB(A) which is weighted towards those portions of the frequency spectrum, between 20 and 20,000 Hertz, to which the human ear is most sensitive. Both measure sound pressure in the atmosphere.

2. Frequency (perceived as pitch), the rate at which a sound source vibrates or makes the air vibrate.

3. Duration i.e., recurring fluctuation in sound pressure or tone at an interval; sharp or startling noise at recurring interval; the temporal nature (continuous vs. intermittent) of sound.

4. Pure tone which is comprised of a single frequency. Pure tones are relatively rare in nature but, if they do occur, they can be extremely annoying.

Another term, related to the average of the sound energy over time, is the Equivalent Sound Level or $L_{eq.}$ The L_{eq} integrates fluctuating sound levels over a period of time to express them as a steady state sound level. As an example, if two sounds are measured and one sound has twice the energy but lasts half as long, the two sounds would be characterized as having the same equivalent sound level. Equivalent Sound Level is considered to be directly related to the effects of sound on people since it expresses the equivalent magnitude of the sound as a function of frequency of occurrence and time. By its derivation L_{eq} does not express the maximum nor minimum SPLs that may occur in a given time period. These maximum and minimum SPLs should be given in the noise analysis. The time interval over which the L_{eq} is measured should always be given. It is generally shown as a parenthetic; $L_{eq\,(8)}$ would indicate that the sound had been measured for a period of eight hours.

Equivalent Sound Level (L_{eq}) correlates well and can be combined with other types of noise analyses such as Composite Noise Rating, Community Noise Equivalent Level and day-night noise levels characterized by L_{dn} where an $L_{eq(24)}$ is measured and 10 dBA is added to all noise levels measured between 10 pm and 7 am. These different types of noise analyses

basically combine noise measurements into measures of cumulative noise exposure and may weight noise occurring at different times by adding decibels to the actual decibel level. Some of these analyses require more complex noise analysis than is mentioned in this guidance. They may be used in a noise analyses prepared for projects.

Designations for sound levels may also be shown as $L_{(10)}$ or $L_{(90)}$ in a noise analysis. These designations refer to the sound pressure level (SPL) that is exceeded for 10% of the time over which the sound is measured, in the case of $L_{(10)}$, and 90% of the time, in the case of $L_{(90)}$. For example, an $L_{(90)}$ of 70 dB(A) means that 70 dB(A) is exceeded for 90% the time for which the measurement was taken.

A. Environmental Setting and Effects on Noise Levels

1. Sound Level Reduction Over Distance - It is important to have an understanding of the way noise decreases with distance. The decrease in sound level from any single noise source normally follows the "inverse square law." That is, SPL changes in inverse proportion to the square of the distance from the sound source. At distances greater than 50 feet from a sound source, every doubling of the distance produces a 6 dB reduction in the sound. Therefore, a sound level of 70 dB at 50 feet would have a sound level of approximately 64 dB at 100 feet. At 200 feet sound from the same source would be perceived at a level of approximately 58 dB.

2. Additive Effects of Multiple Sound Sources - The total sound pressure created by multiple sound sources does not create a mathematical additive effect. Below Table A is given to assist you in calculating combined noise sources. For instance, two proximal noise sources that are 70 dBA each do not have a combined noise level of 140 dBA. In this case the combined noise level is 73 dBA. Since the difference between the two sound levels is 0 dB, Table A tells us to add 3 dB to the sound level to compensate for the additive effects of the sound. To find the cumulative SPL assess the SPLs starting with the two lowest readings and work up to the difference between the two highest readings. For several pieces of equipment, operating at one

time, calculate the difference first between the two lowest SPLs, check Table A and add the appropriate number of decibels to the higher of the two sound levels. Next, take the sound level that was calculated using Table A and subtract the next lowest sound level to be considered for the operation. Consult Table A again for the additive effect and add this to the higher of the two sound levels. Follow this process until all the sound levels are accounted for. As an example, let us say that an area for a new facility is being cleared. The equipment to be used is: two chainsaws, one operating at 57 dBA and one at 60 dBA; a front end loader at 80 dBA; and a truck at 78 dBA. Start with the two lowest sound levels: 60 dBA - 57 dBA = 3 dBA difference. Consulting the chart add 2 dBA to the higher sound level. The cumulative SPL of the two chainsaws is 62 dBA. Next, subtract 62 dBA from 78 dBA. 78 dBA - 62 dBA = 16 dBA. In this case, 0 dBA is added to the higher level so we end up with 78 dBA. Lastly, subtract 78 dBA from the 80 dBA. 80 dBA - 78 dBA = 2 dBA a difference of 2 dBA adds 2 dBA to the higher SPL or 82 dBA. The SPL from these four pieces of equipment operating simultaneously is 82 dBA.

Table A

Approximate Addition of Sound Levels

Difference Between Two Sound Levels	Add to the Higher of the Two Sound Levels
1 dB or less	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0 dB

(USEPA, Protective Noise Levels, 1978)

3. Temperature and Humidity - Sound energy is absorbed in the air as a function of temperature, humidity and the frequency of the sound. This attenuation can be up to 2 dB over 1,000 feet. Such attenuation is short term and, since it occurs over a great distance, should not be considered in calculations. Higher temperatures tend to increase sound velocity but does

not have an effect on the SPL. Sound waves bend towards cooler temperatures. Temperature inversions may cause temporary problems when cooler air is next to the earth allowing for more distant propagation of sound. Similarly, sound waves will bend towards water when it is cooler than the air and bounce along the highly reflective surface. Consequently large water bodies between the sound source and the receptor may affect noise attenuation over distance.

4. Time of Year - Summer time noises have the greatest potential for causing annoyance because of open windows, outside activities, etc. During the winter people tend to spend more time indoors and have the windows closed. In general, building walls and windows that are closed provide a 15 dB reduction in noise levels. Building walls with the windows open allow for only a 5 dB reduction in SPL.

5. Wind - Wind can further reduce the sound heard at a distance if the receptor is upwind of the sound. The action of the wind disperses the sound waves reducing the SPLs upwind. While it is true that sound levels upwind of a noise source will be reduced, receptors downwind of a noise source will not realize an increase in sound level over that experienced at the same distance without a wind. This dispels the common belief that sound levels are increased downwind due to wind carrying noise.

6. Land forms and structures - In certain circumstances, sound levels can be accentuated or focused by certain features to cause adverse noise impacts at specified locations. At a hard rock mine, curved quarry walls may have the potential to cause an amphitheater effect while straight cliffs and quarry walls may cause an echo. Buildings that line streets in cities can cause a canyon effect where sound can be reflected from the building surfaces similar to what might happen in a canyon. Consideration of noise impacts associated with these types of conditions may require specialized expertise to evaluate impact potential and to formulate suitable mitigation techniques.

Consideration of existing noise sources and sound receptors in proximity to a proposed activity can be important considerations even when the activity under review is not a noise source. Topography, vegetation, structures and the relative location of noise receptors and sources to these features are all aspects of the environmental setting that can influence noise impact potential. As such, land alteration may also indirectly create an adverse noise impact where natural land features or manmade features serve as a noise barrier or provide noise attenuation for existing sources of noise, i.e. highway, railroads, manufacturing activity. Removal of these features, i.e. hills, vegetation, large structures or walls, can expose receptors to increased sound pressure levels causing noise problems where none had previously existed.

B. Impact Assessment

1. Factors to Consider

Factors to consider in determining the impact of noise on humans, are as follows:

a. Evaluation of Sound Characteristics

(1) Ambient noise level - A noise can only intrude if it differs in character or SPL from the normal ambient sound. Most objective attempts to assess nuisance noise adopt the technique of comparing the noise with actual ambient sound levels or with some derived criterion.

(2) Future noise level - The ambient noise level plus the noise level from the new or proposed source.

(3) Increase In Sound Pressure Level - A significant factor in determining the annoyance of a noise is Sound Pressure Level (SPL). SPLs are measured in decibels.

(4) Sharp and Startling Noise - These high frequency and high intensity noises can be extremely annoying. When initially evaluating the effects

of noise from an operation, pay particular attention to noises that can be particularly annoying. One such noise is the back-up beepers required to be used on machinery. They definitely catch one's attention as they were meant to do. Continual beeping by machinery can be mitigated (see Section V.C. Mitigation - Best Management Practices). Another impulse noise source that can be very annoying is the exhaust from compressed air machinery. This exhaust is usually released in loud bursts. Compressed air exhaust can also be mitigated if it causes a noise problem by using readily available mufflers or specifically designed enclosures.

(5) Frequency and Tone - Frequency is the rate at which a sound source vibrates or makes the air vibrate. Frequency is measured in Hertz (Hz). Frequency can also be classified as high ("sharp"), low ("dull"), and moderate. Pure tones are rare in nature. Tonal sounds usually consist of pure tones at several frequencies. Pure tones and tonal sounds are discerned more readily by the human ear. Pure tones and tonal sounds are compensated for in sound studies by adding a calculated number of dB(A) to the measured sound pressure.

(6) Percentile of Sound Levels - Fluctuations of SPLs can be expressed as a percentile level designated as $L_{(n)}$ where a given decibel level is exceeded *n* % of the time. A designation of $L_{(10)}$ = 70 dBA means the measured SPLs exceeded 70 dBA 10% of the time. A designation of $L_{(90)}$ = 70 dBA means the measured SPLs were exceeded 90% of the time. $L_{(90)}$ is often used to designate the background noise level.

(7) Expression of Overall Sound - Part of the overall assessment of sound is the *Equivalent Sound Level* (L_{eq}) which assigns a single value of sound level for a period of time in which varying levels of sound are experienced over that time period. The L_{eq} value provides an indication of the effects of sound on people. It is also useful in establishing the ambient sound levels at a potential noise source.

In order to evaluate the above factors in the appropriate context, one must identify the following: 1) appropriate receptor locations for sound level calculation or measurement; 2) ambient sound levels and characteristics at these receptor locations; and 3) the sound pressure increase and characteristics of the sound that represents a significant noise effect at a receptor location.

b. Receptor Locations

Appropriate receptor locations may be either at the property line of the parcel on which the facility is located or at the location of use or inhabitance on adjacent property. The solid waste regulations require the measurements of sound levels be at the property line. The most conservative approach utilizes the property line. The property line should be the point of reference when adjacent land use is proximal to the property line. Reference points at other locations on adjacent properties can be chosen after determining that existing property usage between the property line and the reference point would not be impaired by noise, i.e., property uses are relatively remote from the property line. The location of the facility should be shown on a map in relation to each potential receptor. Any future expansion should be described in a narrative as well as depicted on a map. The map and narrative should also include the distance of the operation to each point of reception including the distance at the point in time when an expanding operation will be closest to the receptors.

c. Thresholds for Significant Sound Pressure Level (SPL) Increase

The goal for any permitted operation should be to minimize increases in sound pressure level above ambient levels at the chosen point of sound reception. Increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound pressure increases of more than 6 dB may require a closer analysis of impact potential depending on

existing SPLs and the character of surrounding land use and receptors. SPL increases approaching 10 dB result in a perceived doubling of SPL. The perceived doubling of the SPL results from the fact that SPLs are measured on a logarithmic scale. An increase of 10 dB(A) deserves consideration of avoidance and mitigation measures in most cases. The above thresholds as indicators of impact potential should be viewed as guidelines subject to adjustment as appropriate for the specific circumstances one encounters.

Establishing a maximum SPL at the point of reception can be an appropriate approach to addressing potential adverse noise impacts. Noise thresholds are established for solid waste management facilities in the Department's Solid Waste regulations, 6 NYCRR Part 360. Most humans find a sound level of 60 - 70 dB(A) as beginning to create a condition of significant noise effect (EPA 550/9-79-100, November 1978). In general, the EPA's "Protective Noise Levels" guidance found that ambient noise levels # 55 dBA $L_{(dn)}$ was sufficient to protect public health and welfare and, in most cases, did not create an annoyance (EPA 550/9-79-100, November 1978). In non-industrial settings the SPL should probably not exceed ambient noise by more than 6 dB(A) at the receptor. An increase of 6 dB(A) may cause complaints. There may be occasions where an increase in SPLs of greater than 6 dB(A) might be acceptable. The addition of any noise source, in a non-industrial setting, should not raise the ambient noise level above a maximum of 65 dB(A). This would be considered the "upper end" limit since 65 dB(A) allows for undisturbed speech at a distance of approximately three feet. Some outdoor activities can be conducted at a SPL of 65 dB(A). Still lower ambient noise levels may be necessary if there are sensitive receptors nearby. These goals can be attained by using the mitigative techniques outlined in this guidance.

Ambient noise SPLs in industrial or commercial areas may exceed 65 dB(A) with a high end of approximately 79 dB(A) (EPA 550/9-79-100, November 1979). In these instances mitigative measures utilizing best management practices should be used in an effort to ensure that a facility's generated sound levels are at a minimum. The goal in an industrial/commercial area, where ambient SPLs are already at a high level, should be not to exceed the ambient SPL. Remember, if a new source

operates at the same noise level as the ambient, then 3 dB(A) must be added to the existing ambient noise level to obtain the future noise level. If the goal is not to raise the future noise levels the new facility would have to operate at 10 dB(A) or more lower than the ambient.(see Table A)

Table B

HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL

Increase in Sound Pressure (dB)	Human Reaction
Under 5	Unnoticed to tolerable
5 - 10	Intrusive
10 - 15	Very noticeable
15 - 20	Objectionable
Over 20	Very objectionable to intolerable

(Down and Stocks - 1978)

Impact assessment will vary for specific project reviews, but must consist of certain basic components for all assessments. Additional examination of sound generation and noise reception are necessary, where circumstances warrant. Sound impact evaluation is an incremental process, with four potential outcomes:

- exemption criteria are met and no noise evaluation is required;
- noise impacts are determined to be non-significant (after first-level evaluation);
- noise impacts are identified as a potential issue but can be readily mitigated (after second level evaluation); or
- noise impacts are identified as a significant issue requiring analysis of alternatives as well as mitigation (third level evaluation).

All levels of evaluation may require preparation of a noise analysis. The required scope of noise impact analysis can be rudimentary to rather sophisticated, depending on circumstances and the results obtained from initial levels of evaluation. Recommendations for each level of evaluation are presented below.

2. Situations in Which No Noise Evaluation is Necessary

When certain criteria are satisfied, the need for undertaking a noise impact analysis at any level is eliminated. These criteria are as follows:

a. The site is contained within an area in which local zoning provides for the intended use as a "right of use". It does not apply to activities that are permissible only after an applicant is granted a special use permit by the local government; and

b. The applicant's operational plan incorporates appropriate best management practices (BMPs [see Section V.C. Mitigation - Best Management Practices]) for noise control for all facets of the operation.

Where activities may be undertaken as a "right of use", it is presumed that noise has been addressed in establishing the zoning. Any residual noise that is present following BMP implementation should be considered an inherent component of the activity that has been found acceptable in consideration of the zoning designation of the site.

3. First Level Noise Impact Evaluation

The initial evaluation for most facilities should determine the maximum amount of sound created at a single point in time by multiple activities for the proposed project. All facets of the construction and operation that produce noise should be included such as land clearing activities (chain saw and equipment operation), drilling, equipment operation for excavating, hauling or conveying materials, pile driving, steel work, material processing, product storage and removal. Land clearing and construction may be only temporary noise at the site whereas the ongoing operation of a facility would be considered permanent noise. An analysis may be required for

various phases of the construction and operation of the project to assure that adverse noise effects do not occur at any phase.

To calculate the sound generated by equipment operation, one can consult the manufacturers' specifications for sound generation, available for various types of equipment. Another option for calculating the sound to be generated by equipment is to make actual measurements of sound generated by existing similar equipment, elsewhere.

Tables C and D summarize noise measurements from some common equipment used in construction and mining. Table E summarizes the noise level, in decibels (dB[A]), from some common sources. This information can be used to assist Department staff in relating potential noise impacts to sound levels produced by commercial and industrial activities. Use of these tables in the first level of analysis will help determine whether or not noise will be an issue and whether actual measurements should be made to confirm noise levels.

Table C

PROJECTED NOISE LEVELS

Noise Source	Measurements	1,000 feet	2,000 feet	3,000 feet
Primary and secondary crusher	89 dB(A) at 100 ft	69.0 dB(A)	63.0 dB(A)	59.5 dB(A)
Hitachi 501 shovel loading	92 dB(A) at 50 ft	66.0 dB(A)	60.0 dB(A)	56.5 dB(A)
Euclid R-50 pit truck loaded	90 dB(A) at 50 ft	64.0 dB(A)	58.0 dB(A)	54.4 dB(A)
Caterpillar 988 loader	80 dB(A) at 300 ft	69.5 dB(A)	63.5 dB(A)	60.0 dB(A)

(The Aggregate Handbook, 1991)

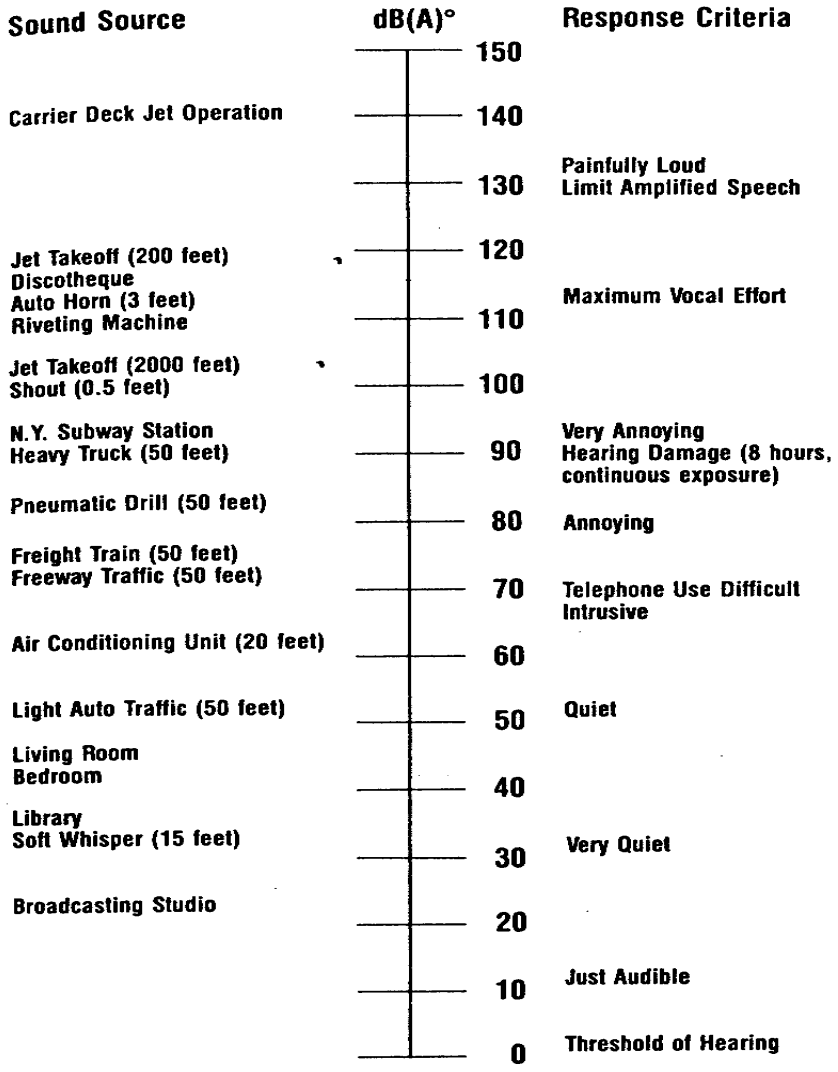
Table D

Common Equipment Sound Levels

EQUIPMENT	**DECIBEL LEVEL**	**DISTANCE** in feet
Augered earth drill	80	50
Backhoe	83-86	50
Cement mixer	63-71	50
Chain saw cutting trees	75-81	50
Compressor	67	50
Garbage Truck	71-83	50
Jackhammer	82	50
Paving breaker	82	50
Wood Chipper	89	50
Bulldozer	80	50
Grader	85	50
Truck	91	50
Generator	78	50
Rock drill	98	50

(excerpt and derived from Cowan, 1994)

Table E



(The Aggregate Handbook, 1991)

The sound level at receptor locations should be calculated using the inverse square rule whereby sound is attenuated over distance. Again, each doubling of the distance from the source of a noise decreases the SPL by 6 dB(A) at distances greater than 50 feet. This calculation should first consider the straight line distance between the point of noise generation and the point of noise reception with the presumption that no natural or manmade features exist along the transect between the two points that would further attenuate sound level. Calculations should be performed for each point of reception in all directions being careful to evaluate the worst case noise impact potential by considering activities at the point where they would be closest to a receptor. The sound level calculated for the point of reception should be related to ambient sound levels. Ambient sound levels can be either measured or assumed based on established references for the environmental setting and land use at the point of reception. For estimation purposes, ambient SPLs will vary from approximately 35 dB(A) in a wilderness area to approximately 87 dB(A) in a highly industrial setting. A quiet seemingly serene setting such as rural farm land will be at the lower end of the scale at about 45 dB(A), whereas an urban industrial area will be at the high end of this scale at around 79 dB(A) (EPA 550/9-79-100, November 1978). If there is any concern that levels based on reference values do not accurately reflect ambient SPL, field measurements should be undertaken to determine ambient SPLs.

Where this evaluation indicates that sound levels at the point of reception will not be perceptible, similar to or only slightly elevated as compared to ambient conditions, no further evaluation is required. When there is an indication from this initial analysis that marginal or significant noise impact may occur, further evaluation is required. In determining the potential for an adverse noise impact, consider not only ambient noise levels, but also the existing land use, and whether or not an increased noise level or the introduction of a discernable sound, that is out of character with existing sounds, will be considered annoying or obtrusive. (see B.1.a Evaluation of Sound Characteristics)

4. Second Level Noise Impact Evaluation

Further refine the evaluation of noise impact potential by factoring in any additional noise attenuation that will be provided by existing natural topography, fabricated structures such as buildings, walls or berms or vegetation located between the point of noise generation and noise reception. This analysis may require consideration of future conditions and the loss of natural noise buffers over time.

Dense vegetation that is at least 100 feet in depth will reduce the sound levels by 3 to 7 dB(A). Evergreens provide a better vegetative screen than deciduous trees. Keep in mind that if a vegetative screen does not currently exist, planting a vegetative screen may require 15 or more years of growth before it becomes effective.

The degree to which topography attenuates noise depends on how close the feature is located to the source or the receptor of the noise. Topography can act as a natural screen. The closer a hill or other barrier is to the noise source or the receptor, the larger the sound shadow will be on the side opposite the noise source. Certain operations such as mining and landfills may be able to use topography to maintain a screen between the operation and receptors as they progress. Mining operations may be able to create screens by opening a mine in the center of the site using and maintaining the pit walls as barriers against sound (Aggregate Handbook, 1991).

If after taking into account all the attenuating features the potential still exists for adverse noise impact, other types of noise analyses or modeling should be used to characterize the source. An Equivalent Sound Level (L_{eq}) analysis or a related type of noise analysis may better define activities or sources that require more mitigation or isolation so that noise emanating from these sources will not cause an adverse impact.

Where it is demonstrated that noise absorbing or deflecting features further attenuate sound reception to a level of no significant increase, no further analysis is necessary. Where it is determined that noise level or the character of the noise may

have a significant adverse effect on receptors, other noise mitigation measures should be evaluated in an expanded noise analysis.

5. Third Level - Mitigation Measures

When the above analyses indicate significant noise effects may or will occur, the applicant should evaluate options for implementation of mitigation measures that avoid, or diminish significant noise effects to acceptable levels (see Section V.C. Mitigation - Best Management Practices). Adequate details concerning mitigation measures and an evaluation of the effectiveness of the mitigative measures through additional sound level calculations should be provided in a noise analysis. These calculations are to factor in the noise reduction or avoidance capabilities of the mitigation measures. In circumstances where noise effects cannot readily be reduced to a level of no significance by project design or operational features in the application, the applicant must evaluate alternatives and mitigation measures in an environmental impact statement to avoid or reduce impacts to the maximum extent practicable per the requirements of the State Environmental Quality Review Act (SEQR).

The noise analysis should be part of the application or a supplement to it, and will be part of the SEQR environmental assessment by reference. Duplicative noise analysis information is not required for the permit application and the assessment of impacts under SEQR. A proper analysis can satisfy information needs for both purposes.

C. Mitigation - Best Management Practices (BMP) for Reducing Noise

Various noise abatement techniques are available for reducing frequency of sound, duration of sound or SPLs at receptor locations. The mitigation techniques given below are listed according to what sound characteristic they mitigate.

1. Reduce noise frequency and impulse noise at the source of generation by:

   a. Replacing back-up beepers on machinery with strobe lights (subject to other requirements, e.g., OSHA and Mine Safety and Health Administration, as applicable). This eliminates the most annoying impulse beeping;

   b. Using appropriate mufflers to reduce the frequency of sound on machinery that pulses, such as diesel engines and compressed air machinery;

   c. Changing equipment: using electric motors instead of compressed air driven machinery; using low speed fans in place of high speed fans;

   d. Modifying machinery to reduce noise by using plastic liners, flexible noise control covers, and dampening plates and pads on large sheet metal surfaces; and

2. Reduce noise duration by:

   a. Limiting the number of days of operation, restricting the hours of operation and specifying the time of day and hours of access and egress can abate noise impacts.

   b. Limiting noisier operations to normal work day hours may reduce or eliminate complaints.

Limiting hours of construction or operation can be an effective tool in reducing potential adverse impacts of noise. The impacts of noise on receptors can be

significantly reduced by effectively managing the hours at which the loudest of the operations can take place.

Implementation of hours of operation does not reduce the SPL emanating from a facility. Determining whether or not hours of operation will be effective, mitigation requires consideration of: public safety, for example road construction at night may reduce traffic concerns and facilitate work; duration of the activity, is it a one time event necessary to meet a short term goal or will the activity become an ongoing operation; and surrounding land use, consider what type(s) of land use is proximal to the activity and at what time(s) might a reduction of noise levels be necessary. There may be other factors to consider due to the uniqueness of a given activity or the type of land use adjacent to the activity. Hours of operation should also consider weekend activities and legal holidays that may change the types of land use adjacent to the permitted activity or increase traffic levels in an area.

The best results from using hours of operation as a mitigative measure will be obtained if the hours are negotiated with the owner or operator of the facility. The less noisy aspects of an operation may not have to be subject to the requirements of hours of operation such as preparing, greasing and maintaining machinery for the upcoming day's operation. The more noisy operations can be scheduled to begin when people in the receptor area are less likely to be adversely effected. Hours of operation should be included in the operation plans for a facility that becomes part of the permit, or in the event that there is no operation plan, can be included as a permit condition.

3. Reduce Noise sound pressure levels by:

   a. Increasing the setback distance.
   b. Moving processing equipment during operation further from receptors.
   c. Substituting quieter equipment (example - replacing compressed air fan with an electric fan could result in a 20 dB reduction of noise level).

d. Using mufflers selected to match the type of equipment and air or gas flow on mechanical equipment.
e. Ensuring that equipment is regularly maintained.
f. Enclosing processing equipment in buildings (example - enclosing noisy equipment could result in an 8-10 dB noise level reduction, a 9 inch brick wall can reduce SPL by 45-50 dB).
g. Erecting sound barriers such as screens or berms around the noise generating equipment or near the point of reception. The angle of deflection also increases as the height of a screen or barrier increases. Screens or barriers should be located as close to the noise source or the receptor as possible. The closer the barrier is located to the source or the receptor, the greater the angle of deflection of the sound waves will be creating a larger "sound shadow" on the side opposite the barrier. Stockpiles of raw material or finished product can be an effective sound barrier if strategically placed.
h. phasing operations to preserve natural barriers as long as possible.
i. altering the direction, size, proximity of expanding operations.
j. Designing enclosed facilities to prevent or minimize an SPL increases above ambient levels. This would require a noise analysis and building designed by a qualified engineer that includes adequate ventilation with noise abatement systems on the ventilation system.

Public notification of upcoming loud events can also be used as a form of mitigation although it doesn't fit easily into the categories above. People are less likely to get upset if they know of an upcoming event and know that it will be temporary.

The applicant should demonstrate that the specific mitigation measures proposed will be effective in preventing adverse noise effects on receptors.

D. Decision Making - Conditioning Permits to Limit Noise Impacts

Preferably, the mitigation measures as outlined in the construction and operational plans should be relied upon to mitigate the effects of noise on receptors. The permit should state that the activity will be conducted in accordance with the approved plan. Otherwise, mitigation measures and BMP's can be imposed within specific permit conditions.

It is not the intention of this guidance to require decibel limits to be established for operations where such limits are not required by regulation. There are, however, instances when a decibel limit may be established for an operation to ensure activities do not create unacceptable noise effects, as follows:

1. The review of a draft and final environmental impact statement demonstrates the need for imposition of a decibel limit;
2. A decibel limit is established by the Commissioner's findings after a public hearing has been held on an application;
3. The applicant asks to have a decibel limit to demonstrate the ability to comply; or
4. A program division seeks to establish a decibel limit as a permit condition, when necessary to demonstrate avoidance of unacceptable noise impact.

Ultimately, the final decision must incorporate appropriate measures to minimize or avoid significant noise impacts, as required under SEQR. Any unavoidable adverse effects must be weighed along with other social and economic considerations in deciding whether to approve or deny a permit.

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3) U.S. Dept of Transportation - Federal Highway Administration Office of Research and Development; Highway Noise-A Manual for Highway Noise and Land Use, Nov. 1974.

4) New York State Motor Vehicle Law, Chapter IV, Subchapter E, 450.2, Part 450, "Noise From Heavy Motor Vehicles," 200.701 CN, February 28, 1997.

5) Beranek, L.A. ed., Noise and Vibration Control. Cambridge, MA: Institute of Noise Control Engineering, 1971, pp. 164-174 and 182-191.

6) Barksdale, R.D., editor, 1991. The Aggregate Handbook: National Stone Association (Washington, DC), 1.V.

7) Norman, David K., Wampler , Peter J., Throop, Allen H., Schnitzer, E. Frank, and Roloff, J., 1996. "Best Management Practices for Reclaiming Surface Mines in Washington and Oregon." Oregon Dept. of Geology and Mineral Industries, Open File Report 0-96-2.

8) United States Environmental Protection Agency, Protective Noise Levels, Condensed Version of EPA Levels document, EPA 550/9-79-100, November 1978, Office of Noise Abatement & Control, Washington, D.C.

9) United States Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, EPA 550/9-74-004, March 1974, Office of Noise Abatement and Control, Washington, D.C.

10) City of Davis General Plan, Appendix E Background Information on Environmental Acoustics, November 1996.

11) The Australian National University, “Physics and Psychophysics of Music”, ACAT 1003, David Worrall, http://www.anu.edu.au/ITA/ACAT/drw/PPofM/Intensity2.html, 1998.

12) Danish Wind Turbine Manufacturers Association, Measuring and Calculating Sound Levels, November 18, 1997.

Additional Reading

a. Beranek, Leo L. and Istavan L. Ver, Noise and Vibration Control Engineering, John Wiley & Sons, Inc. New York, 1992.

b. Beranek, Leo L., Noise and Vibration Control, Institute of Noise Control Engineering, Revised Edition, Washington, C.C., 1988.

c. Diehl, George, M., Machinery Acoustics, John Wiley & Sons, New York, 1973.

d. Erwin, J.D., Graf, E. R., Industrial Noise and Vibration Control, Prentice Hall, Englewood Cliffs, New Jersey, 1979.

e. Jensen, Paul, et al, Industrial Noise Control Manual, U.S. Department of Health, Education and Welfare, Public Health Service, Cincinnati, 1978.

APPENDIX B -
INSTRUMENT CALIBRATION SHEETS

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 5392
Description Quest QC-10 Acoustic Calibrator
Calibrated 5/26/2022

Manufacturer Quest
Model Number QC-10
Serial Number QID050172
Location New Jersey
Temp 70

Classification
Status pass
Frequency Yearly
Department Lab
Humidity 35

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration

Test Instrument ID	Description	Manufacturer	Serial Number	(As Of Cal Entry Date) Last Cal Date	Next Cal Date
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	7/27/2021	7/27/2022
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	7/27/2021	7/27/2022

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated David Galego

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

CASELLA

Certificate of Conformity and Calibration FA05190

Instrument Type:-	**CEL-633C**
Serial Number	4210504
Firmware revision	V006-05
Microphone Type:-	**CEL-251**
Serial Number	05084
Preamplifier Type:-	**CEL-495**
Serial Number	005056
Instrument Class/Type:-	1

Applicable standards:-

IEC 61672: 2002 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	22 °C	**Test Engineer:-**	Nicola Cartwright
	32 %RH	**Date of Issue:-**	July 4, 2022
	1014 mBar		

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

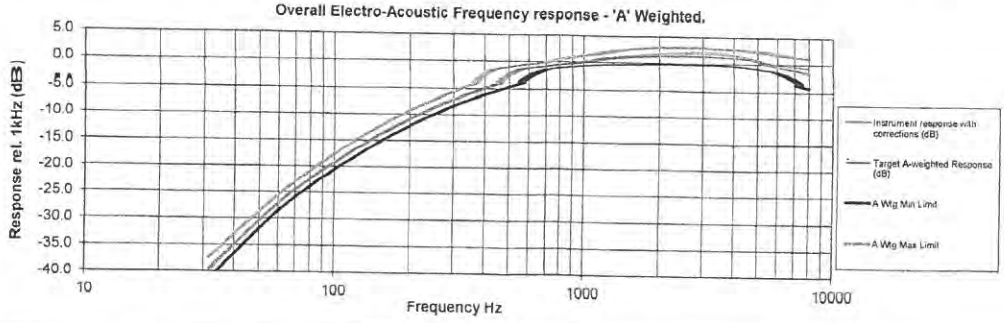
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
C-peak Sound Levels	**All Tests Pass**
Overload Indication	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - *A Weighted*

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



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Page 1 of 1

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 17320
Description Quest SoundPro DL-2-1/3
Calibrated 5/27/2022

Manufacturer Quest
Model Number SoundPro DL-2-1/3
Serial Number BIJ090026
Location New Jersey
Temp 70

Classification
Status pass
Frequency Yearly
Department Lab
Humidity 40

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration

				(As Of Cal Entry Date)	
Test Instrument ID	**Description**	**Manufacturer**	**Serial Number**	**Last Cal Date**	**Next Cal Date**
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	7/27/2021	7/27/2022
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	7/27/2021	7/27/2022

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated David Galego

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

CASELLA

Certificate of Conformity and Calibration

Instrument Model:-	CEL-633C		
Serial Number	0442231		
Firmware revision	V129-09		
Microphone Type:-	CEL-252	Preamplifier Type:-	CEL-495
Serial Number	89713	Serial Number	001775
Instrument Class/Type:-	2		

Applicable standards:-

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- The test sequences performed in this report are in accordance with the current Sound level meter *Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	22 °C 25 %RH 1015 mBar	Test Engineer:- Date of Issue:-	Paul Blackwell December 22, 2021

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

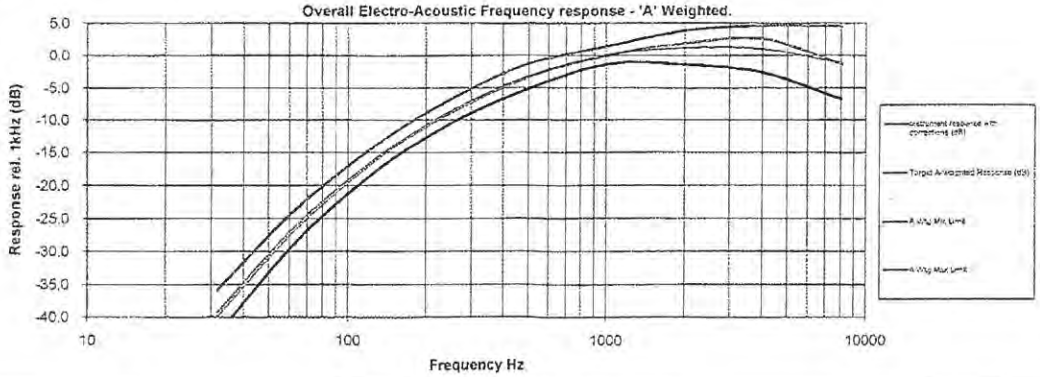
Test Summary:-

Self Generated Noise Test	All Tests Pass
Electrical Signal Test Of Frequency Weightings	All Tests Pass
Frequency & Time Weightings At 1 kHz	All Tests Pass
Level Linearity On The Reference Level Range	All Tests Pass
Toneburst Response Test	All Tests Pass
C-peak Sound Levels	All Tests Pass
Overload Indication	All Tests Pass
Acoustic Tests	All Tests Pass

Combined Electro-Acoustic Frequency Response - A Weighted

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



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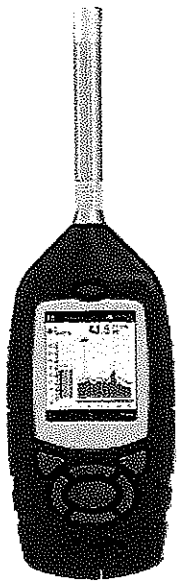
Fax: +86-21-61605905
Email: info@casellasolutions.cn

Certificate of Conformity and Calibration



Instrument Model:-	**CEL-633C**		
Serial Number	4637949		
Firmware revision	V129-09		
Microphone Type:-	**CEL-252**	**Preamplifier Type:-**	**CEL-495**
Serial Number	60590	Serial Number	002125
Instrument Class/Type:-	**2**		

Applicable standards:-

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- The test sequences performed in this report are in accordance with the current Sound level meter *Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	23 °C	**Test Engineer:-**	Paul Blackwell
	33 %RH	**Date of Issue:-**	December 14, 2021
	1021 mBar		

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

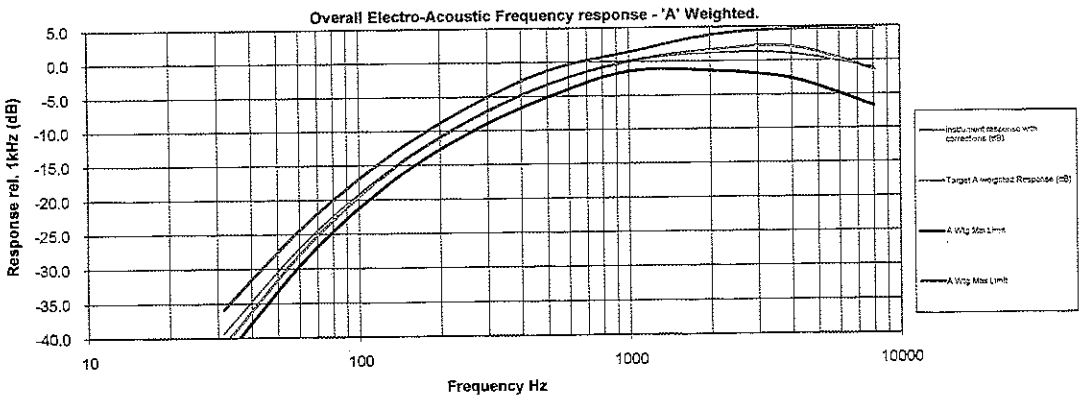
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
C-peak Sound Levels	**All Tests Pass**
Overload Indication	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - A Weighted

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



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www.casellasolutions.com FA01770

Certificate of Conformity and Calibration

Instrument Model:-	**CEL-633C**		
Serial Number	2145334		
Firmware revision	V129-09		
Microphone Type:-	**CEL-251**	**Preamplifier Type:-**	**CEL-495**
Serial Number	5766	Serial Number	004239
Instrument Class/Type:-	1		

Applicable standards:-

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- The test sequences performed in this report are in accordance with the current Sound level meter *Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-

23 °C
29 %RH
999 mBar

Test Engineer:- Paul Blackwell
Date of Issue:- April 12, 2022

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

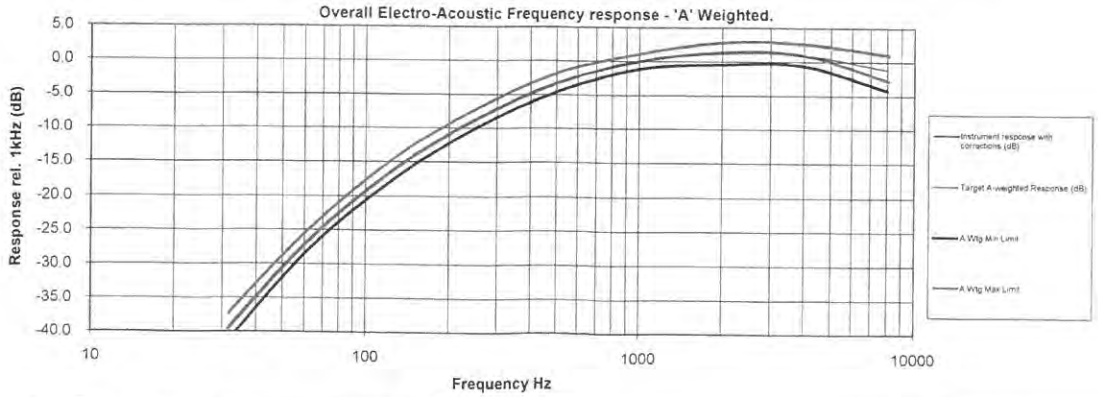
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
C-peak Sound Levels	**All Tests Pass**
Overload Indication	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - A Weighted

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



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CASELLA

Certificate of Conformity and Calibration

Customer:	Eco-Rental Solutions
Instrument:	CEL-120/1
Serial Number:	5230919
Job Number:	25508
Date of Issue:	12-Apr-2022
Engineer:	P Blackwell

Traceable Equipment:		
	Reference Calibrator	EQ11085
	DVM type Fluke 45	EQ00318

Test Conditions:

Ambient Temperature	23.0	°C
Ambient Humidity	29.0	%RH
Ambient Pressure	999	mBar

Results:

	Level 1	Level 2	Frequency
Initial Reading	114.04 dB	N/A dB	1.0000 kHz
Final Reading	114.00 dB	N/A dB	1.0000 kHz

Uncertainty:

Level	±	0.15	dB
Frequency	±	0.5	Hz

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.
Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9000:2015 quality procedures.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

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APPENDIX C -
PHOTO LOG

Photo 1: M-1 – Monitoring location M-1 is located adjacent to Residential Receptor R-2 located on Hale Hill Road at elevation 795 ft. amsl. 4,500 ft. from the Firing Pad.

Photo 2: M-2 – Monitoring Location M-2 is located south of the Firing Pad adjacent to Residential Receptor R-42 on Pulsifer Road at elevation 715 ft. amsl., 9,500 ft. from the Firing Pad.

Photo 3: M-3 – Monitoring Location M-3 is located southeast of the Firing Pad along Route 9 at elevation 660 ft. amsl., 7,700 ft. from the firing pad.

Photo 4: M-4 – Monitoring Location M-4 is located southwest of the Firing Pad adjacent to State Lands classified as Wild Forest at elevation 1,500 ft. amsl., 5,200 ft. from the firing pad.

Photo 5: M-5 – Monitoring Location M-5 is located northeast of the Firing Pad adjacent to State Lands classified as Wild Forest at elevation 1,380 ft. amsl., 510 ft. from the firing pad.

APPENDIX D -
MODEL DATA

SOUND SOURCE

SOURCE	SOUND POWER LEVEL dB	SOUND POWER LEVEL dB(A)	HEIGHT ABOVE GROUND (m)
M109A3GN (155 mm) Howitzer	180.8	163.2	2
40 Ton Haul Truck	117.6	115.7	2

MODEL CONFIGURATION

MODEL PARAMETER	SETTINGS
Atmospheric Absorption	20°C / 70% Humidity
Ground Absorption	0.7G Ground Factor
Receiver Height	1.5 meters for sound level isolines and receivers
Model Radius	3,218 m

MODELED SOUND LEVEL AT RECEIVERS

M 109 No Berm

RECEIVER	Molded Impulse Sound Level dB(A)	HEIGHT ABOVE GROUND (m)
M-1	75	1.5
M-2	71	1.5
M-3	73	1.5
M-4	79	1.5
M-5	107	1.5

M 109 with Berm

RECEIVER	Molded Impulse Sound Level dB(A)	HEIGHT ABOVE GROUND (m)
M-1	67	1.5
M-2	71	1.5
M-3	73	1.5
M-4	79	1.5
M-5	100	1.5

40-Ton Haul Truck No Berm

RECEIVER	Molded Impulse Sound Level dB(A)	HEIGHT ABOVE GROUND (m)
M-1	44	1.5
M-2	20	1.5
M-3	33	1.5
M-4	33	1.5
M-5	60	1.5

APPENDIX E –
2022 BALLISTICS TEST RANGE SOUND ANALYSES SCOPE OF WORK

H2H GEOSCIENCE ENGINEERING

179 River Street, Troy, New York 12180

Environmental Professionals
Geologic Consultants
Construction Services

(518) 270-1620/Fax (518) 270-1672

November 9, 2022

Fritz Aldinger
APA Environmental Program Specialist 1

Re: 2022 Ballistics Test Range Sound Analyses
Lewis, NY
APA Project No. 2021-0276

Dear Fritz:

H2H Geoscience and Engineering, PLLC is pleased to submit the following Scope of Work to perform a sound analysis at the above reference site.

Project Understanding

Unconventional Concepts, Inc. (UCI) intends to construct a ballistics test rang for use in supporting research and development operations of various kinetic systems used by the United States. A record of UCI's submission to the Adirondack Park Agency (APA) was provided to H2H Geoscience Engineering, PLLC (H2H) for review; based on our review of the provided reports, H2H has developed the following Scope of Work (SOW).

Scope of Work

H2H intends to collect ambient (no unapproved UCI operations taking place) sound levels, as well has additional sound level modeling to support a revised sound study, to address the APA's June 6, 2022 - Third Notice of Incomplete Permit Application.

Task 1: Sound Level Monitoring

H2H has developed a Site Overview Map (Figure 1) showing all identified receptors within a two-mile radius (Project Area) of the ballistics testing Firing Pad. The Firing Pad (100 ft. by 100 ft.) is in the northeast corner of parcel 38.1-1-31.000 (UCI Site). The Control Operations Area is located adjacent to the Firing Pad; the Target Area is located 590 ft. west of the Firing Pad (Figure 2).

Forty-two Residential Receptors (occupied residential structure) were identified with the two-mile radius. Four parcels of State Land classified as Wild Forest fall within the two-mile radius; no parcels of State Land classified as Wilderness are within the two-mile radius.

Based on the locations of identified receptors H2H selected five sound level monitoring locations surrounding the Firing Pad to best determine ambient sound level conditions in the Project Area. H2H will conduct sound level monitoring at each of the identified five-monitoring location (Figure 1) to identify, and note major sources of sound contributing to ambient conditions. Collected sound levels will be A-weighted, logged at 1-second intervals. Monitoring will take place during the anticipated hours of operation (10:00 AM – 4:00 PM) over the course of two weekdays. Monitoring will be conducted during fair weather conditions. The collected sound levels will serve as ambient sound levels for the area surrounding each monitoring location.

The following is a description of each sound monitoring location:

M-1 – Monitoring location M-1 is located adjacent to Residential Receptor R-2 located on Hale Hill Road at elevation 795 ft. amsl. 4,500 ft. from the Firing Pad. This monitoring location will provide ambient sound levels for R-2 (closest Residential Receptor), and the surrounding area of Hale Hill Road.

M-2 – Monitoring Location M-2 is located south of the Firing Pad adjacent to Residential Receptor R-42 on Pulsifer Road at elevation 715 ft. amsl., 9,500 ft. from the Firing Pad. This monitoring location will provide ambient sound levels for the area surround Pulsifer Rd.

M-3 – Monitoring Location M-3 is located southeast of the Firing Pad along Route 9 at elevation 660 ft. amsl., 7,700 ft. from the firing pad. This monitoring location will provide ambient sound levels for the area along State Route 9 and adjacent commercial area.

M-4 - Monitoring Location M-4 is located southwest of the Firing Pad adjacent to State Lands classified as Wild Forest at elevation 1,500 ft. amsl., 5,200 ft. from the firing pad. This monitoring location will provide ambient sound levels for land classified as Wild Forest to the southwest

M-5 – Monitoring Location M-5 is located northeast of the Firing Pad adjacent to State Lands classified as Wild Forest at elevation 1,380 ft. amsl., 510 ft. from the firing pad. This monitoring location will provide ambient sound levels of land classified as Wild Forest to the northeast.

Task 2: Sound Level Modeling

Based on source sound level data (loudest kinetic systems to be tested) provided by UCI, H2H will model the anticipated sound level at identified receptors under fair weather conditions, and worst case (overcast with wind toward receptor) weather conditions. H2H will follow NYSDEC Guidance documents for evaluating the modeled sound level at receptors vs. the measured ambient sound level at each receptor.

If you have any questions regarding this information, please contact me at 518.270.1620 ext. 102, or by email mpolacco@h2hg-e.com.

Sincerely,

H2H Geoscience Engineering, PLLC

Michael Polacco

Michael Polacco
Project Geologist

c. Richard A. Hisert, PhD PG – H2H
Lori Settle – Unconventional Concepts, Inc.

FIGURES

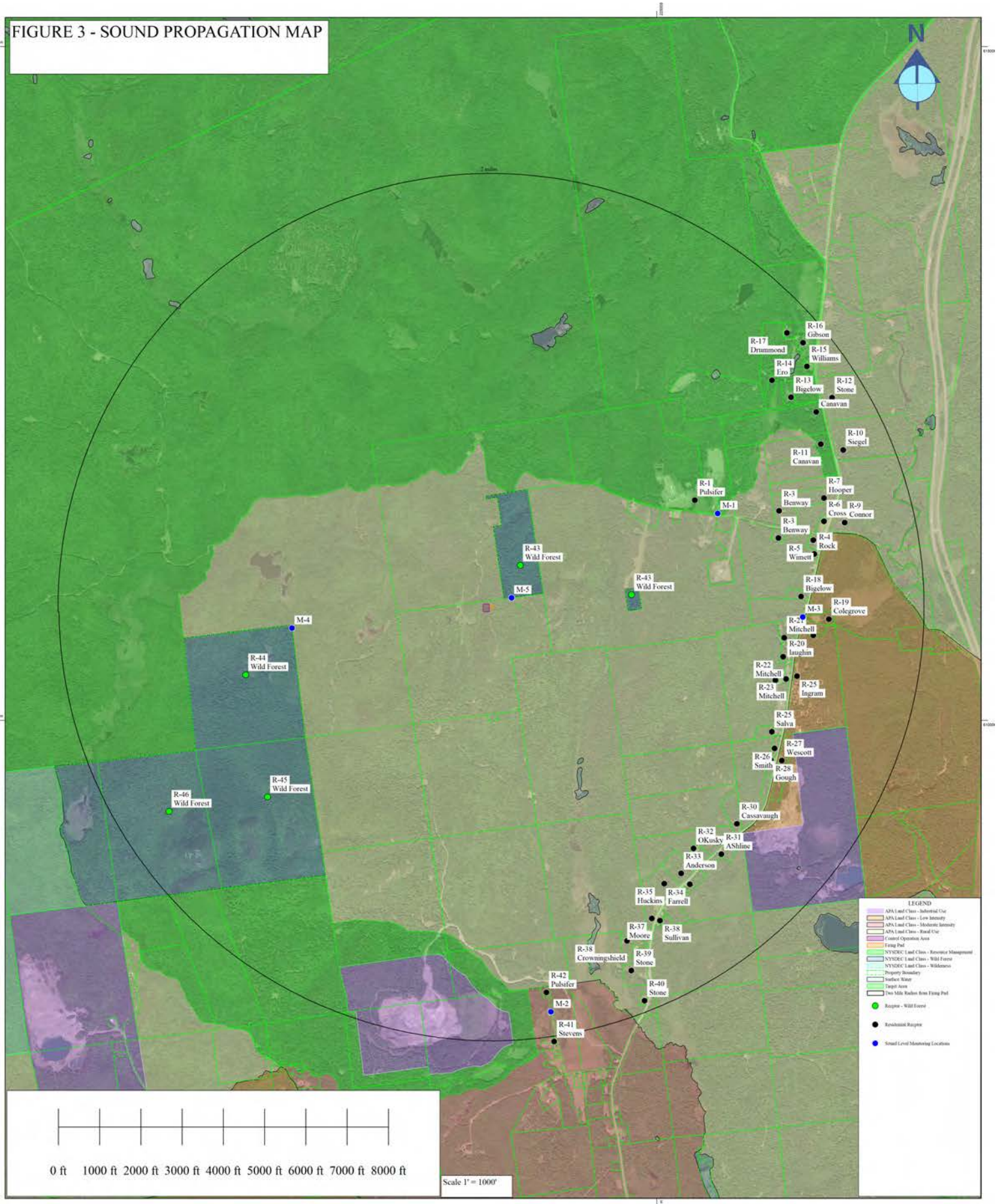
FIGURE 3 - SOUND PROPAGATION MAP
N
R-16 Gibson
R-17 Drummond
R-15 Williams
R-14 Ero
R-13 Bigelow
R-12 Stone
Canavan
R-10 Siegel
R-11 Canavan
R-1 Pulsifer
M-1
R-7 Hooper
R-3 Benway
R-6 Cross
R-9 Connor
R-3 Benway
R-4 Rock
R-5 Wimett
R-43 Wild Forest
M-5
R-43 Wild Forest
R-18 Bigelow
M-3
R-19 Colegrove
M-4
R-21 Mitchell
R-20 Iaughin
R-44 Wild Forest
R-22 Mitchell
R-25 Ingram
R-23 Mitchell
R-25 Salva
R-27 Wescott
R-26 Smith
R-28 Gough
R-45 Wild Forest
R-46 Wild Forest
R-30 Cassavaugh
R-32 OKusky
R-31 AShline
R-33 Anderson
R-35 Huckins
R-34 Farrell
R-37 Moore
R-38 Sullivan
R-38 Crowningshield
R-39 Stone
R-42 Pulsifer
R-40 Stone
M-2
R-41 Stevens
LEGEND
APA Land Class - Industrial Use
APA Land Class - Low Intensity
APA Land Class - Moderate Intensity
APA Land Class - Rural Use
Control Operation Area
Firing Pad
NYSDEC Land Class - Resource Management
NYSDEC Land Class - Wild Forest
NYSDEC Land Class - Wilderness
Property Boundary
Surface Water
Target Area
Two Mile Radius from Firing Pad
Receptor - Wild Forest
Residential Receptor
Sound Level Monitoring Locations
0 ft 1000 ft 2000 ft 3000 ft 4000 ft 5000 ft 6000 ft 7000 ft 8000 ft
Scale 1" = 1000'

FIGURE - 2 SITE MAP

APPENDIX F –
INPUT DATA and RESULTS of SOUND PROPGATION MODELS

Noise Mapping Results 40 ton haul truck / No Berm

*** Receiver Results - Summary ***

Receiver Name	Height (m)	Total dB(A)	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
M-1	1.5	44.39		21.03	19.76	23.27	35.13	42.26	38.29	23.78	-20.33
M-2	1.5	20.1		6.99	7.74	10.78	16.84	14.8	-0.03	-49.88	-225.27
M-3	1.5	32.75		14.6	12.56	16.68	26.08	30.73	23.04	-3.93	-95.95
M-4	1.5	32.8		12.96	14.15	18.5	27.88	29.95	22.73	-2.68	-87.75
M-5	1.5	60.42		32.52	36.21	37.12	49.88	57.52	55.59	48.12	31.51
Test Point	1.5	56.47		29.62	32.37	33.48	46.17	53.74	51.49	42.89	21.99

*** Receiver Results - Sources Analysis ***

Receiver Name	Point	Point-2	Point-3
M-1 [1.5m]	44.36	21.12	17.91
M-2 [1.5m]	12.74	16.13	16.29
M-3 [1.5m]	32.37	19.64	18.25
M-4 [1.5m]	18.79	28.99	30.17
M-5 [1.5m]	21.75	59.97	50.33
Test Point [1.5m]	14.09	55.98	46.69

*** Receiver Results - Full Detail ***

Receiver Name	Source Name	Distance to source (m)	Height including ground level (m)	Source height including ground level (m)	Frequency (Hz)	Lw	Ad	Aa	Ag	Ab (total)	Ab (top edge)	Ab (lateral 1)	Ab (lateral 2)	Adjustment	A-Weighting	Lp
M-1	Point	670.31	224.5	254.58	63	109	-67.53	-0.06	5.53	0	-	-	-	0	-26.2	20.74
M-1	Point	670.31	224.5	254.58	125	107	-67.53	-0.23	-3.86	0	-	-	-	0	-16.1	19.29
M-1	Point	670.31	224.5	254.58	250	107	-67.53	-0.76	-7.46	0	-	-	-	0	-8.6	22.66
M-1	Point	670.31	224.5	254.58	500	111	-67.53	-1.88	-3.38	0	-	-	-	0	-3.2	35.02
M-1	Point	670.31	224.5	254.58	1000	112	-67.53	-3.34	1.1	0	-	-	-	0	0	42.24
M-1	Point	670.31	224.5	254.58	2000	109	-67.53	-6.04	1.66	0	-	-	-	0	1.2	38.29
M-1	Point	670.31	224.5	254.58	4000	104	-67.53	-15.36	1.66	0	-	-	-	0	1	23.78
M-1	Point	670.31	224.5	254.58	8000	98	-67.53	-51.36	1.66	0	-	-	-	0	-1.1	-20.33
M-1	Point-2	1824.41	224.5	421.6	63	109	-76.22	-0.16	5.83	-5.55	-5.55	-	-	0	-26.2	6.69
M-1	Point-2	1824.41	224.5	421.6	125	107	-76.22	-0.62	-5.49	-0.84	-0.84	-	-	0	-16.1	7.72
M-1	Point-2	1824.41	224.5	421.6	250	107	-76.22	-2.07	-7.37	-0.17	-0.17	-	-	0	-8.6	12.57
M-1	Point-2	1824.41	224.5	421.6	500	111	-76.22	-5.1	-3.29	-5.95	-5.95	-	-	0	-3.2	17.23
M-1	Point-2	1824.41	224.5	421.6	1000	112	-76.22	-9.08	1.19	-11.4	-11.4	-	-	0	0	16.48
M-1	Point-2	1824.41	224.5	421.6	2000	109	-76.22	-16.45	1.75	-13.92	-13.92	-	-	0	1.2	5.36
M-1	Point-2	1824.41	224.5	421.6	4000	104	-76.22	-41.8	1.75	-16.65	-16.65	-	-	0	1	-27.93
M-1	Point-2	1824.41	224.5	421.6	8000	98	-76.22	-139.79	1.75	-19.52	-19.52	-	-	0	-1.1	-136.88
M-1	Point-3	1908.29	224.5	408.01	63	109	-76.61	-0.17	5.83	-6.58	-6.58	-	-	0	-26.2	5.27
M-1	Point-3	1908.29	224.5	408.01	125	107	-76.61	-0.65	-5.49	-2.36	-2.36	-	-	0	-16.1	5.79
M-1	Point-3	1908.29	224.5	408.01	250	107	-76.61	-2.16	-7.37	-2.27	-2.27	-	-	0	-8.6	9.99
M-1	Point-3	1908.29	224.5	408.01	500	111	-76.61	-5.34	-3.29	-8.58	-8.58	-	-	0	-3.2	13.98
M-1	Point-3	1908.29	224.5	408.01	1000	112	-76.61	-9.5	1.19	-14.43	-14.43	-	-	0	0	12.65
M-1	Point-3	1908.29	224.5	408.01	2000	109	-76.61	-17.21	1.75	-17.2	-17.2	-	-	0	1.2	0.93
M-1	Point-3	1908.29	224.5	408.01	4000	104	-76.61	-43.72	1.75	-20.09	-20.09	-	-	0	1	-33.67
M-1	Point-3	1908.29	224.5	408.01	8000	98	-76.61	-146.22	1.75	-23.03	-23.03	-	-	0	-1.1	-147.21
M-2	Point	3847.96	223.45	254.58	63	109	-82.7	-0.35	5.92	-4.77	-4.77	-	-	0	-26.2	0.9
M-2	Point	3847.96	223.45	254.58	125	107	-82.7	-1.31	-5.46	0	0.69	-	-	0	-16.1	1.43
M-2	Point	3847.96	223.45	254.58	250	107	-82.7	-4.36	-7.34	0	2.57	-	-	0	-8.6	4
M-2	Point	3847.96	223.45	254.58	500	111	-82.7	-10.77	-3.26	-1.51	-1.51	-	-	0	-3.2	9.56
M-2	Point	3847.96	223.45	254.58	1000	112	-82.7	-19.15	1.22	-4.77	-4.77	-	-	0	0	6.59
M-2	Point	3847.96	223.45	254.58	2000	109	-82.7	-34.7	1.78	-4.77	-4.77	-	-	0	1.2	-10.2
M-2	Point	3847.96	223.45	254.58	4000	104	-82.7	-88.16	1.78	-4.77	-4.77	-	-	0	1	-68.86
M-2	Point	3847.96	223.45	254.58	8000	98	-82.7	-294.83	1.78	-4.77	-4.77	-	-	0	-1.1	-283.63
M-2	Point-2	3033.08	223.45	421.6	63	109	-80.64	-0.27	5.9	-4.92	-4.92	-	-	0	-26.2	2.87
M-2	Point-2	3033.08	223.45	421.6	125	107	-80.64	-1.03	-5.47	0	0.41	-	-	0	-16.1	3.76
M-2	Point-2	3033.08	223.45	421.6	250	107	-80.64	-3.43	-7.35	0	2.02	-	-	0	-8.6	6.98
M-2	Point-2	3033.08	223.45	421.6	500	111	-80.64	-8.49	-3.27	-2.56	-2.56	-	-	0	-3.2	12.85
M-2	Point-2	3033.08	223.45	421.6	1000	112	-80.64	-15.1	1.21	-6.68	-6.68	-	-	0	0	10.8
M-2	Point-2	3033.08	223.45	421.6	2000	109	-80.64	-27.35	1.77	-7.99	-7.99	-	-	0	1.2	-4.01
M-2	Point-2	3033.08	223.45	421.6	4000	104	-80.64	-69.49	1.77	-9.82	-9.82	-	-	0	1	-53.19
M-2	Point-2	3033.08	223.45	421.6	8000	98	-80.64	-232.4	1.77	-12.1	-12.1	-	-	0	-1.1	-226.46
M-2	Point-3	3157.54	223.45	408.01	63	109	-80.99	-0.28	5.9	-4.8	-4.8	-	-	0	-26.2	2.63
M-2	Point-3	3157.54	223.45	408.01	125	107	-80.99	-1.07	-5.47	0	0.65	-	-	0	-16.1	3.37
M-2	Point-3	3157.54	223.45	408.01	250	107	-80.99	-3.58	-7.35	0	2.47	-	-	0	-8.6	6.49
M-2	Point-3	3157.54	223.45	408.01	500	111	-80.99	-8.83	-3.27	-1.7	-1.7	-	-	0	-3.2	13.01
M-2	Point-3	3157.54	223.45	408.01	1000	112	-80.99	-15.72	1.21	-5.16	-5.16	-	-	0	0	11.35
M-2	Point-3	3157.54	223.45	408.01	2000	109	-80.99	-28.47	1.77	-5.52	-5.52	-	-	0	1.2	-3.01
M-2	Point-3	3157.54	223.45	408.01	4000	104	-80.99	-72.34	1.77	-6.16	-6.16	-	-	0	1	-52.72
M-2	Point-3	3157.54	223.45	408.01	8000	98	-80.99	-241.93	1.77	-7.21	-7.21	-	-	0	-1.1	-231.46
M-3	Point	1562.38	204.5	254.58	63	109	-74.88	-0.14	5.8	0	-	-	-	0	-26.2	13.58
M-3	Point	1562.38	204.5	254.58	125	107	-74.88	-0.53	-5.49	0	-	-	-	0	-16.1	10
M-3	Point	1562.38	204.5	254.58	250	107	-74.88	-1.77	-7.38	0	-	-	-	0	-8.6	14.38
M-3	Point	1562.38	204.5	254.58	500	111	-74.88	-4.37	-3.3	0	-	-	-	0	-3.2	25.25
M-3	Point	1562.38	204.5	254.58	1000	112	-74.88	-7.78	1.18	0	-	-	-	0	0	30.53
M-3	Point	1562.38	204.5	254.58	2000	109	-74.88	-14.09	1.74	0	-	-	-	0	1.2	22.98
M-3	Point	1562.38	204.5	254.58	4000	104	-74.88	-35.8	1.74	0	-	-	-	0	1	-3.93
M-3	Point	1562.38	204.5	254.58	8000	98	-74.88	-119.71	1.74	0	-	-	-	0	-1.1	-95.95
M-3	Point-2	2315.51	204.5	421.6	63	109	-78.29	-0.21	5.86	-5.11	-5.11	-	-	0	-26.2	5.05
M-3	Point-2	2315.51	204.5	421.6	125	107	-78.29	-0.79	-5.48	0	0.06	-	-	0	-16.1	6.34
M-3	Point-2	2315.51	204.5	421.6	250	107	-78.29	-2.62	-7.36	0	1.37	-	-	0	-8.6	10.13
M-3	Point-2	2315.51	204.5	421.6	500	111	-78.29	-6.48	-3.28	-3.66	-3.66	-	-	0	-3.2	16.09
M-3	Point-2	2315.51	204.5	421.6	1000	112	-78.29	-11.53	1.2	-8.37	-8.37	-	-	0	0	15.01
M-3	Point-2	2315.51	204.5	421.6	2000	109	-78.29	-20.88	1.76	-10.31	-10.31	-	-	0	1.2	2.48
M-3	Point-2	2315.51	204.5	421.6	4000	104	-78.29	-53.05	1.76	-12.67	-12.67	-	-	0	1	-37.26
M-3	Point-2	2315.51	204.5	421.6	8000	98	-78.29	-177.42	1.76	-15.31	-15.31	-	-	0	-1.1	-172.36
M-3	Point-3	2450.06	204.5	408.01	63	109	-78.78	-0.22	5.87	-5.21	-5.21	-	-	0	-26.2	4.46
M-3	Point-3	2450.06	204.5	408.01	125	107	-78.78	-0.83	-5.48	-0.13	-0.13	-	-	0	-16.1	5.68
M-3	Point-3	2450.06	204.5	408.01	250	107	-78.78	-2.77	-7.36	0	1.05	-	-	0	-8.6	9.49
M-3	Point-3	2450.06	204.5	408.01	500	111	-78.78	-6.86	-3.28	-4.15	-4.15	-	-	0	-3.2	14.73
M-3	Point-3	2450.06	204.5	408.01	1000	112	-78.78	-12.2	1.2	-9.07	-9.07	-	-	0	0	13.16
M-3	Point-3	2450.06	204.5	408.01	2000	109	-78.78	-22.09	1.76	-11.18	-11.18	-	-	0	1.2	-0.1
M-3	Point-3	2450.06	204.5	408.01	4000	104	-78.78	-56.13	1.76	-13.67	-13.67	-	-	0	1	-41.82
M-3	Point-3	2450.06	204.5	408.01	8000	98	-78.78	-187.73	1.76	-16.39	-16.39	-	-	0	-1.1	-184.24
M-4	Point	2712.58	461.64	254.58	63	109	-79.67	-0.24	5.88	-4.83	-4.83	-	-	0	-26.2	3.94
M-4	Point	2712.58	461.64	254.58	125	107	-79.67	-0.92	-5.47	0	0.59	-	-	0	-16.1	4.84
M-4	Point	2712.58	461.64	254.58	250	107	-79.67	-3.07	-7.35	0	2.36	-	-	0	-8.6	8.31
M-4	Point	2712.58	461.64	254.58	500	111	-79.67	-7.59	-3.27	-1.94	-1.94	-	-	0	-3.2	15.34
M-4	Point	2712.58	461.64	254.58	1000	112	-79.67	-13.5	1.21	-5.6	-5.6	-	-	0	0	14.43
M-4	Point	2712.58	461.64	254.58	2000	109	-79.67	-24.46	1.77	-6.3	-6.3	-	-	0	1.2	1.54
M-4	Point	2712.58	461.64	254.58	4000	104	-79.67	-62.15	1.77	-7.43	-7.43	-	-	0	1	-42.48
M-4	Point	2712.58	461.64	254.58	8000	98	-79.67	-207.84	1.77	-9.07	-9.07	-	-	0	-1.1	-197.91
M-4	Point-2	1525.05	461.64	421.6	63	109	-74.67	-0.14	5.79	-4.77	-4.77	-	-	0	-26.2	9.02
M-4	Point-2	1525.05	461.64	421.6	125	107	-74.67	-0.52	-5.49	0	0.72	-	-	0	-16.1	10.23
M-4	Point-2	1525.05	461.64	421.6	250	107	-74.67	-1.73	-7.38	0	2.61	-	-	0	-8.6	14.63
M-4	Point-2	1525.05	461.64	421.6	500	111	-74.67	-4.27	-3.3	-1.47	-1.47	-	-	0	-3.2	24.1
M-4	Point-2	1525.05	461.64	421.6	1000	112	-74.67	-7.59	1.18	-4.77	-4.77	-	-	0	0	26.15
M-4	Point-2	1525.05	461.64	421.6	2000	109	-74.67	-13.75	1.74	-4.77	-4.77	-	-	0	1.2	18.75
M-4	Point-2	1525.05	461.64	421.6	4000	104	-74.67	-34.94	1.74	-4.77	-4.77	-	-	0	1	-7.64
M-4	Point-2	1525.05	461.64	421.6	8000	98	-74.67	-116.85	1.74	-4.77	-4.77	-	-	0	-1.1	-97.65
M-4	Point-3	1410.76	461.64	408.01	63	109	-73.99	-0.13	5.78	-4.77	-4.77	-	-	0	-26.2	9.69
M-4	Point-3	1410.76	461.64	408.01	125	107	-73.99	-0.48	-5.48	0	0.71	-	-	0	-16.1	10.95
M-4	Point-3	1410.76	461.64	408.01	250	107	-73.99	-1.6	-7.38	0	2.61	-	-	0	-8.6	15.43
M-4	Point-3	1410.76	461.64	408.01	500	111	-73.99	-3.95	-3.3	-1.47	-1.47	-	-	0	-3.2	25.09
M-4	Point-3	1410.76	461.64	408.01	1000	112	-73.99	-7.02	1.18	-4.77	-4.77	-	-	0	0	27.39
M-4	Point-3	1410.76	461.64	408.01	2000	109	-73.99	-12.72	1.73	-4.77	-4.77	-	-	0	1.2	20.45
M-4	Point-3	1410.76	461.64	408.01	4000	104	-73.99	-32.32	1.73	-4.77	-4.77	-	-	0	1	-4.35
M-4	Point-3	1410.76	461.64	408.01	8000	98	-73.99	-108.09	1.73	-4.77	-4.77	-	-	0	-1.1	-88.22
M-5	Point	1153.41	419.14	254.58	63	109	-72.24	-0.1	5.72	-8.13	-8.13	-	-	0	-26.2	8.05
M-5	Point	1153.41	419.14	254.58	125	107	-72.24	-0.39	-5.36	-4.63	-4.63	-	-	0	-16.1	8.28
M-5	Point	1153.41	419.14	254.58	250	107	-72.24	-1.31	-7.4	-4.9	-4.9	-	-	0	-8.6	12.55
M-5	Point	1153.41	419.14	254.58	500	111	-72.24	-3.23	-3.32	-11.59	-11.59	-	-	0	-3.2	17.42
M-5	Point	1153.41	419.14	254.58	1000	112	-72.24	-5.74	1.16	-17.71	-17.71	-	-	0	0	17.47
M-5	Point	1153.41	419.14	254.58	2000	109	-72.24	-10.4	1.72	-20.61	-20.61	-	-	0	1.2	8.67
M-5	Point	1153.41	419.14	254.58	4000	104	-72.24	-26.43	1.72	-23.56	-23.56	-	-	0	1	-15.51
M-5	Point	1153.41	419.14	254.58	8000	98	-72.24	-88.38	1.72	-25	-25	-	-	0	-1.1	-87
M-5	Point-2	154.71	419.14	421.6	63	109	-54.79	-0.01	3.96	0	-	-	-	0	-26.2	31.96
M-5	Point-2	154.71	419.14	421.6	125	107	-54.79	-0.05	-0.34	0	-	-	-	0	-16.1	35.71
M-5	Point-2	154.71	419.14	421.6	250	107	-54.79	-0.18	-7.51	0	-	-	-	0	-8.6	35.92
M-5	Point-2	154.71	419.14	421.6	500	111	-54.79	-0.43	-3.62	0	-	-	-	0	-3.2	48.96
M-5	Point-2	154.71	419.14	421.6	1000	112	-54.79	-0.77	0.66	0	-	-	-	0	0	57.1
M-5	Point-2	154.71	419.14	421.6	2000	109	-54.79	-1.39	1.19	0	-	-	-	0	1.2	55.2
M-5	Point-2	154.71	419.14	421.6	4000	104	-54.79	-3.54	1.19	0	-	-	-	0	1	47.85
M-5	Point-2	154.71	419.14	421.6	8000	98	-54.79	-11.85	1.19	0	-	-	-	0	-1.1	31.44
M-5	Point-3	268.37	419.14	408.01	63	109	-59.57	-0.02	4.83	-4.77	-4.77	-	-	0	-26.2	23.26
M-5	Point-3	268.37	419.14	408.01	125	107	-59.57	-0.09	-0.85	-3.93	-3.93	-	-	0	-16.1	26.46
M-5	Point-3	268.37	419.14	408.01	250	107	-59.57	-0.3	-7.63	0	2.85	-	-	0	-8.6	30.9
M-5	Point-3	268.37	419.14	408.01	500	111	-59.57	-0.75	-3.57	-1.21	-1.21	-	-	0	-3.2	42.7
M-5	Point-3	268.37	419.14	408.01	1000	112	-59.57	-1.34	0.89	-4.77	-4.77	-	-	0	0	47.21
M-5	Point-3	268.37	419.14	408.01	2000	109	-59.57	-2.42	1.45	-4.77	-4.77	-	-	0	1.2	44.88
M-5	Point-3	268.37	419.14	408.01	4000	104	-59.57	-6.15	1.45	-4.77	-4.77	-	-	0	1	35.95
M-5	Point-3	268.37	419.14	408.01	8000	98	-59.57	-20.56	1.45	-4.78	-4.78	-	-	0	-1.1	13.43
Test Point	Point	1132.57	424.34	254.58	63	109	-72.08	-0.1	5.72	-15.33	-15.33	-	-	0	-26.2	1.01
Test Point	Point	1132.57	424.34	254.58	125	107	-72.08	-0.38	-5.34	-12.89	-12.89	-	-	0	-16.1	0.2
Test Point	Point	1132.57	424.34	254.58	250	107	-72.08	-1.28	-7.4	-13.78	-13.78	-	-	0	-8.6	3.86
Test Point	Point	1132.57	424.34	254.58	500	111	-72.08	-3.17	-3.32	-20.83	-20.83	-	-	0	-3.2	8.4
Test Point	Point	1132.57	424.34	254.58	1000	112	-72.08	-5.64	1.16	-25	-25	-	-	0	0	10.44
Test Point	Point	1132.57	424.34	254.58	2000	109	-72.08	-10.21	1.72	-25	-25	-	-	0	1.2	4.62
Test Point	Point	1132.57	424.34	254.58	4000	104	-72.08	-25.95	1.72	-25	-25	-	-	0	1	-16.31
Test Point	Point	1132.57	424.34	254.58	8000	98	-72.08	-86.78	1.72	-25	-25	-	-	0	-1.1	-85.24
Test Point	Point-2	234.34	424.34	421.6	63	109	-58.4	-0.02	4.66	0	-	-	-	0	-26.2	29.04
Test Point	Point-2	234.34	424.34	421.6	125	107	-58.4	-0.08	-0.65	0	-	-	-	0	-16.1	31.77
Test Point	Point-2	234.34	424.34	421.6	250	107	-58.4	-0.27	-7.64	0	-	-	-	0	-8.6	32.1
Test Point	Point-2	234.34	424.34	421.6	500	111	-58.4	-0.66	-3.59	0	-	-	-	0	-3.2	45.15
Test Point	Point-2	234.34	424.34	421.6	1000	112	-58.4	-1.17	0.84	0	-	-	-	0	0	53.28
Test Point	Point-2	234.34	424.34	421.6	2000	109	-58.4	-2.11	1.4	0	-	-	-	0	1.2	51.09
Test Point	Point-2	234.34	424.34	421.6	4000	104	-58.4	-5.37	1.4	0	-	-	-	0	1	42.63
Test Point	Point-2	234.34	424.34	421.6	8000	98	-58.4	-17.96	1.4	0	-	-	-	0	-1.1	21.94
Test Point	Point-3	380.37	424.34	408.01	63	109	-62.6	-0.03	5.17	-4.77	-4.77	-	-	0	-26.2	20.56
Test Point	Point-3	380.37	424.34	408.01	125	107	-62.6	-0.13	-1.65	-3.12	-3.12	-	-	0	-16.1	23.4
Test Point	Point-3	380.37	424.34	408.01	250	107	-62.6	-0.43	-7.56	0	2.79	-	-	0	-8.6	27.8
Test Point	Point-3	380.37	424.34	408.01	500	111	-62.6	-1.06	-3.48	-1.29	-1.29	-	-	0	-3.2	39.36
Test Point	Point-3	380.37	424.34	408.01	1000	112	-62.6	-1.89	0.99	-4.77	-4.77	-	-	0	0	43.73
Test Point	Point-3	380.37	424.34	408.01	2000	109	-62.6	-3.43	1.55	-4.77	-4.77	-	-	0	1.2	40.95
Test Point	Point-3	380.37	424.34	408.01	4000	104	-62.6	-8.71	1.55	-4.77	-4.77	-	-	0	1	30.46
Test Point	Point-3	380.37	424.34	408.01	8000	98	-62.6	-29.14	1.55	-4.77	-4.77	-	-	0	-1.1	1.93

*** Objects ***

Receivers	x	y	Height
M-5	223928.1	-610911.14	1.5
M-1	225443.6	-611524.14	1.5
M-3	226117.97	-610772.77	1.5
M-2	224221.6	-607854.58	1.5
M-4	222268.48	-610680.36	1.5
Test Point	355.58	-8.26	1.5

Point Sources	x	y	Height	Lw	Hz
Point	1133.26	-813.94	2 -		31.5
-	-	-	-	109	63
-	-	-	-	107	125
-	-	-	-	107	250
-	-	-	-	111	500
-	-	-	-	112	1000
-	-	-	-	109	2000
-	-	-	-	104	4000
-	-	-	-	98	8000
Point-2	121.26	-6.94	2 -		31.5
-	-	-	-	109	63
-	-	-	-	107	125
-	-	-	-	107	250
-	-	-	-	111	500
-	-	-	-	112	1000
-	-	-	-	109	2000
-	-	-	-	104	4000
-	-	-	-	98	8000
Point-3	-9.74	-112.94	2 -		31.5
-	-	-	-	109	63
-	-	-	-	107	125
-	-	-	-	107	250
-	-	-	-	111	500
-	-	-	-	112	1000
-	-	-	-	109	2000
-	-	-	-	104	4000
-	-	-	-	98	8000

Ground Height Points	x	y	Height
-	134.08	295.24	480
-	514.08	-44.76	475

Ground Height Lines	x	y	Height
-	4476.27	2642.71	163
-	4430.44	2830.57	
-	4390.79	2796.89	
-	4201.84	2828.04	
-	4117.14	2864.1	
-	4098.98	2926.24	
-	4059.83	2971.18	
-	4011.51	2892.73	
-	3906.23	2834.88	
-	3824.28	2863.63	
-	3851.44	2784.45	
-	3811.91	2761.54	
-	3781.83	2689.14	
-	3742	2649.37	
-	3749.31	2601.68	
-	3791.18	2563.94	
-	3764.8	2488.74	
-	3773.32	2376.23	

-	3743.06	2360.98	
-	3687.72	2389.28	
-	3639.09	2389.21	
-	3535.5	2333.86	
-	3440.6	2250.16	
-	3416.01	2183.17	
-	3364.78	2120.28	
-	3372.67	2100.43	
-	3355.11	2100.73	
-	3388.22	1997.46	
-	3349.65	1865.71	
-	3366.62	1826.87	
-	3391.38	1935.46	
-	3464.55	1963.86	
-	3486.94	2004.47	
-	3519.04	2019.65	
-	3546.25	2121.98	
-	3653.14	2165.99	
-	3671.98	2282.77	
-	3764.26	2303.52	
-	3856.52	2368.63	
-	3940.82	2328.01	
-	3970.3	2287.25	
-	4019.57	2274.47	
-	4022.31	2292.04	
-	4124.68	2342.09	
-	4101.27	2381.59	
-	4107.37	2416.37	
-	4202.15	2523.69	
-	4283.96	2502.63	
-	4357.19	2438.58	
-	4363.94	2332.52	
-	4265.78	2257.63	
-	4178.56	2291.79	
-	4151.03	2283.02	
-	4199.26	2219.83	
-	4167.36	2192.97	
-	4138.45	2094.77	
-	4067.99	2086.64	
-	4063.55	2058.89	
-	4095.48	2017.32	
-	4128.51	2013.63	
-	4138.09	1941.77	
-	4178	1894.95	
-	4165.88	1861.5	
-	4255.87	1615.7	
-	4318.49	1539.34	
-	4382.92	1398.92	
-	4485.41	1294.85	
-	3594.69	3017.68	183
-	3645.24	2688.77	
-	3613.14	2673.89	
-	3588.39	2622.64	
-	3596.83	2558.97	
-	3572.11	2512.01	
-	3512.54	2496.05	
-	3419.5	2508.32	
-	3373.96	2471.03	
-	3329.68	2386.01	
-	3307.92	2383.31	
-	3312.02	2314.45	
-	3284.28	2210.16	
-	3232.54	2144.41	
-	3184.94	2145.89	
-	3272.35	2083.34	
-	3281.62	2043.17	
-	3269.04	2002.9	
-	3244.3	1991.11	
-	3235.51	1914.5	
-	3207.34	1915.27	
-	3195.96	1871.49	
-	3135.62	1808.15	
-	3165.66	1804.61	
-	3144.44	1776.45	
-	3162.67	1743.88	
-	3083.12	1685.93	
-	3063.16	1693.4	
-	2964.53	1640.22	
-	2870.85	1648.8	
-	2830.17	1605.47	
-	2799.61	1632.88	
-	2750.73	1633.43	
-	2728.07	1601.99	
-	2736.24	1570.55	
-	2717.33	1576.64	
-	2772.53	1483.59	
-	2770.73	1356.54	
-	2786.68	1338.7	
-	2824.25	1350.47	
-	2866.72	1329.11	
-	2896.16	1243.66	
-	2888.14	1125.91	
-	2923.34	1077.52	
-	2956.56	955.85	
-	2996.48	884.09	
-	3106	804.81	
-	3159.44	791.41	
-	3258.78	824.31	
-	3300.04	766.56	
-	3308.9	780.48	
-	3309.72	645.39	
-	3211.17	593.27	
-	3183.95	552.44	
-	3192.45	512.32	
-	3233.64	466.61	
-	3233.39	431.04	
-	3247.93	445.2	
-	3306.57	429.55	
-	3296.6	456.5	
-	3314.19	464.32	
-	3272.53	524.22	
-	3289.52	507.2	
-	3327.76	570.78	
-	3426.14	650.88	
-	3459.02	713.82	
-	3478.57	818.24	
-	3469.96	930.75	
-	3492.7	1027.54	
-	3535.9	1105.11	
-	3512.35	1196.06	
-	3559.09	1259.78	
-	3574.64	1319.83	
-	3538.39	1332.32	
-	3522.64	1284.06	
-	3496.08	1276.34	
-	3342.46	1359.41	
-	3308.89	1402.24	
-	3363.1	1549.61	
-	3364.78	1632.65	
-	3417.19	1713.09	
-	3405.82	1831.54	
-	3506.53	1944.13	
-	3567.49	2087.38	
-	3675.23	2146.6	
-	3699.02	2212.77	
-	3727.21	1934.65	
-	3742.56	1957.08	
-	3753.32	1942.74	
-	3763.88	2097.35	
-	3802.63	1954.75	
-	3811.73	1981.13	
-	3823.85	1964	
-	3805.88	2268.86	
-	3887.74	2241.66	
-	3899.55	2191.91	
-	3951.71	2185.71	
-	4028.1	2103.3	
-	4037.71	2028.61	
-	4100.34	1975.64	
-	4136.68	1889.99	
-	4108.07	1849.28	
-	4152.96	1821.6	
-	4224.07	1612.55	
-	4299.42	1518.06	
-	4341.39	1399.19	
-	4438.56	1271.46	
-	4485.41	1173.86	
-	4491.51	94.57	183
-	4491.51	79.63	
-	4473.22	2998.58	183
-	4431.61	2980.04	
-	4390.07	2913.96	
-	4202.89	2907.86	
-	4159.14	2935.69	
-	4104.34	3020.73	
-	4321.04	3023.78	183
-	4378.05	2984.28	
-	4417.29	2991.32	
-	4439.62	3023.78	
-	1000.84	4502.06	203
-	954.84	4439.32	
-	960.21	4413.69	
-	991.32	4408.65	
-	1061.56	4486.92	
-	1075.41	4456.85	
-	1026.49	4400.39	
-	1068.37	4386.16	
-	1036.16	4363.81	
-	1041.26	4335.29	
-	1008.27	4260.53	
-	961.91	4233.87	
-	906.99	4243.27	
-	915.7	4317.14	
-	892.65	4324.26	
-	888.74	4354.41	
-	822.78	4327.26	
-	776.27	4159.86	
-	749.64	3861.98	
-	815.66	3822.36	
-	778.52	3827.98	
-	778.04	3810.67	
-	819.16	3804.57	
-	910.08	3857.41	
-	940.68	3852.52	
-	949.03	3813.37	
-	959.1	3867.85	
-	1010.69	3904.69	
-	991.39	3820.65	
-	1022.9	3777.99	
-	1050.36	3788.82	
-	1044.76	3740.2	
-	1107.14	3750.28	
-	1100.79	3779.66	
-	1080.47	3767.72	
-	1065.77	3791.68	
-	1128.82	3847.37	
-	1168.94	3842.08	
-	1192.99	3736.75	
-	1223.21	3734.98	
-	1242.64	3674.62	
-	1309.49	3611.09	
-	1245.85	3530.27	
-	1266.82	3514.23	
-	1265.72	3457.1	
-	1349.42	3503.21	
-	1418.05	3482.05	
-	1430.86	3532.15	
-	1479	3591.78	
-	1479.68	3629.64	
-	1516.72	3669.66	
-	1504.93	3635.44	
-	1532.42	3633.49	
-	1532.37	3565.33	
-	1562.81	3528.73	
-	1506.47	3473.16	
-	1498.06	3388.71	
-	1472.71	3383.98	
-	1435.43	3418.95	
-	1361.71	3319.94	
-	1391.47	3295.25	
-	1333.92	3310.15	
-	1286.58	3210.96	
-	1314.32	3208.1	
-	1341.48	3235.67	
-	1414.16	3191.69	
-	1393.23	3087.93	
-	1350.08	3083.67	
-	1357.99	3063.58	

-	3579.93	-1861.98		-
-	3567.89	-1844.12		-
-	3543.81	-1868.2		-
-	3566.38	-1909.36		-
-	3500.83	-1923.06	203	-
-	3364.67	-974.94		-
-	3345.42	-887.06		-
-	3299.77	-1134.03		-
-	3337.14	-1226.14		-
-	3356.8	-1234.38		-
-	3368.37	-1214.53	203	-
-	2364.02	-1983.23		-
-	2322.41	-1883.51		-
-	2327.22	-1843.86		-
-	2279.22	-1765.73		-
-	2296.52	-1755.15		-
-	2331.13	-1755.85		-
-	2387.14	-1880.46		-
-	2369.22	-1911.21		-
-	2393.22	-1995.02	203	-
-	4491.51	-60.58		-
-	4476.18	-64.72		-
-	4475.21	-99.37		-
-	4436.7	-94.41		-
-	4375.59	-150.46		-
-	4211.09	-126.77		-
-	4184.05	38.74		-
-	4140.88	122.1		-
-	4081.02	197.45		-
-	3969.35	274.58		-
-	3820.21	219.07		-
-	3689.28	89.27		-
-	3667.95	42.3		-
-	3651.55	-126.28		-
-	3673.97	-198.07		-
-	3738.77	-271.92		-
-	3781.04	-373.92		-
-	3767.16	-396.79		-
-	3699.88	-392.94		-
-	3622.14	-435.59		-
-	3506.47	-371.28		-
-	3458.94	-482.49		-
-	3446.01	-593.29		-
-	3465.75	-641.37		-
-	3441.04	-700.73		-
-	3441.42	-828.88		-
-	3469.51	-1056.25		-
-	3418.5	-791.65		-
-	3471.84	-1351.55		-
-	3451.06	-1745.27		-
-	3449.19	-1643.67		-
-	3430.8	-1600.17		-
-	3419.08	-1622.37		-
-	3009.11	-1626.41		-
-	3089.42	-1535.99		-
-	3086.47	-1577.84		-
-	3056.97	-1598.07		-
-	3053.32	-1625.42		-
-	3102.45	-1596.83		-
-	3113.79	-1615.26		-
-	3110.53	-1663.85		-
-	3065.4	-1692.37		-
-	3068.64	-1737.92		-
-	2980.58	-1831.76		-
-	3004.18	-1838.05		-
-	2986.4	-1896.42		-
-	2954.04	-1903.47		-
-	2937.32	-2037.32		-
-	2983.03	-2071.94		-
-	3005.12	-2099.61		-
-	2997.09	-2114.81		-
-	2931.99	-2107.08		-
-	2991.66	-2127.12		-
-	2871.04	-2146.71		-
-	2885.31	-2169.16		-
-	2863.66	-2194.16		-
-	2682.06	-2271.67		-
-	2571.78	-2488.93		-
-	2693.38	-2331.79		-
-	2717.29	-2319.26		-
-	2702.83	-2331.07		-
-	2716.75	-2337.38		-
-	2878.19	-2255.49		-
-	2929.91	-2273.28		-
-	2943.12	-2345.21		-
-	3009.23	-2328.42		-
-	3098.19	-2371.89		-
-	3179.82	-2373.85		-
-	3205.75	-2404.22		-
-	3180.25	-2307.78		-
-	3214.67	-2303.14		-
-	3234.67	-2321.36		-
-	3250.4	-2266.88		-
-	3289.53	-2223.82		-
-	3346.08	-2076.55		-
-	3373.33	-1908.76		-
-	3302.73	-1996.23		-
-	3267.09	-2000.28		-
-	3273.01	-1928.85		-
-	3244.8	-1895.93		-
-	3280.38	-1903.78		-
-	3320.32	-1859.22		-
-	3320.98	-1805.13		-
-	3347.44	-1797.1		-
-	3354.48	-1767		-
-	3321.03	-1755.51		-
-	3351.35	-1736.43		-
-	3331.93	-1639.69		-
-	3293.93	-1604.61		-
-	3263.17	-1618.38		-
-	3232.59	-1573.47		-
-	3272.55	-1562.72		-
-	3323.84	-1511.6		-
-	3372.99	-1558.32		-
-	3342.56	-1634.27		-
-	3353.92	-1642.58		-
-	3394.23	-1596.95		-
-	3405.34	-1626.4		-
-	3415.57	-1538.99		-
-	2978	-1593.93		-
-	2974.1	-1547.73		-
-	3001.11	-1502.5		-
-	2989.34	-1468.48		-
-	3043.74	-1319.6		-
-	3010.68	-1284.06		-
-	3028.57	-1238.28		-
-	3018.36	-1225.03		-
-	2967.53	-1232.93		-
-	2924.33	-1190.61		-
-	2870.27	-1079.05		-
-	2719.55	-1461.82		-
-	2671.81	-1508.83		-
-	2664.66	-1541.04		-
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-	2562.19	-329.3		-
-	2549.82	-352.74		-
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-	2284.93	319.48		-
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-	2226.75	411.42		-
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-	1453.73	2319.69		-
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-	1516.68	2478.12		-
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-	1423.25	2539.15		-
-	1439.32	2603.02		-
-	1411.48	2642.5		-
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-		1201.19	3924.44	
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-		1580.12	4244.83	
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-		1403.34	4359.46	
-		1443.16	4374.93	
-		1428.19	4505.11	
-		3495.03	3017.68	203
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-		3496.55	2624.36	
-		3535.33	2562.26	
-		3502.36	2549.92	
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-		2693.11	2617.26	
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-		3024.56	1895.93	
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-	2018.8	167.94	
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-	1668.75	1883.91	
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-	1507.51	1987.5	
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-		-4311.19	-1182.42	
-		-4500.11	-1346.35	
-		-4503.16	-924.23	763
-		-4342.94	-1045.18	
-		-4329.39	-1088.89	
-		-4358.82	-1180.58	
-		-4500.11	-1296.15	
-		-4503.16	-980.48	783
-		-4395.56	-1049.23	
-		-4378.15	-1102.63	
-		-4399.26	-1161.42	
-		-4503.16	-1245.77	
-		-4503.16	-1032.33	803
-		-4445.51	-1065.1	
-		-4434.52	-1103.24	
-		-4445.71	-1140.49	
-		-4503.16	-1197	

*** Configuration ***
Heights for all calculation results are absolute
0.7G Ground Factor
20.0Â°C Temperature
70% Humidity
Results are A-weighted
Results are rounded to 0 decimal places
Second order reflections are included
Reflections are only considered at a distance of 1m or greater from a reflector (facade level)
ISO9613-2 barrier attenuation limit (20/25dB) is enabled
Vertical edges (lateral paths) are included
Limited to convex paths
Following ISO17534-3 recommendation 5.2
Ground reflections are screened (original ISO9613-2 method)

*** Key ***

Lw	Sound Power Level (dB)
Ad	Distance attenuation aka geometrical divergence" ISO9613-2 (dB)"
Ab	Barrier attenuation ISO9613-2 (dB)
Ag	Ground effect ISO9613-2 (dB)
Aa	Air absorption ISO9613-1 (dB)

Noise Mapping Results M 109 with Berm

*** Receiver Results - Summary ***

Receiver Name	Height (m)	Total dB(A)	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz	
M-5	1.5	100.39	83.36	92.65	87.57	77.14	94.53	95.69	91.67	83.74	65.77	20.97	
M-1	1.5	67.45	59.06	65.9	56.29	44.13	54.49	50.67	40.6	11.88	-92.02	-462.58	
M-3	1.5	73.34	62.12	71.18	63.68	52.04	64.72	61.2	47.96	9.35	-126.21	-607.39	
M-2	1.5	71.22	60.1	69.25	61.29	49.11	62.29	58.24	43.33	-3.65	-174.49	-789.01	
M-4	1.5	79.49	66.08	75.38	67.79	56.8	73.19	72.97	65.11	40.57	-47.17	-357.66	

*** Receiver Results - Sources Analysis ***

Receiver Name	Point
M-5 [1.5m]	100.39
M-1 [1.5m]	67.45
M-3 [1.5m]	73.34
M-2 [1.5m]	71.22
M-4 [1.5m]	79.49

*** Receiver Results - Full Detail ***

Receiver Name	Source Name	Distance to source (m)	Height including ground level (m)	Source height including ground level (m)	Frequency (Hz)	Lw	Ad	Aa	Ag	Ab (total)	Ab (top edge)	Ab (lateral 1)	Ab (lateral 2)	Adjustment	A-Weighting	Lp
M-5	Point	169.84	419.14	422.48	31.5	179.1	-55.6	0	4.14	-4.88	-4.88	-	-	0	-39.4	83.36
M-5	Point	169.84	419.14	422.48	63	175.3	-55.6	-0.02	4.14	-4.98	-4.98	-	-	0	-26.2	92.65
M-5	Point	169.84	419.14	422.48	125	164.5	-55.6	-0.06	-0.38	-4.79	-4.79	-	-	0	-16.1	87.57
M-5	Point	169.84	419.14	422.48	250	149.1	-55.6	-0.19	-7.57	0	2.03	-	-	0	-8.6	77.14
M-5	Point	169.84	419.14	422.48	500	160	-55.6	-0.48	-3.63	-2.57	-2.57	-	-	0	-3.2	94.53
M-5	Point	169.84	419.14	422.48	1000	158.7	-55.6	-0.85	0.7	-7.27	-7.27	-	-	0	0	95.69
M-5	Point	169.84	419.14	422.48	2000	155.2	-55.6	-1.53	1.24	-8.84	-8.84	-	-	0	1.2	91.67
M-5	Point	169.84	419.14	422.48	4000	151.9	-55.6	-3.89	1.24	-10.91	-10.91	-	-	0	1	83.74
M-5	Point	169.84	419.14	422.48	8000	147.6	-55.6	-13.01	1.24	-13.35	-13.35	-	-	0	-1.1	65.77
M-5	Point	169.84	419.14	422.48	16000	144.9	-55.6	-46.92	1.24	-16.05	-16.05	-	-	0	-6.6	20.97
M-1	Point	1815.25	224.5	422.48	31.5	179.1	-76.18	-0.04	5.83	-10.25	-10.25	-	-	0	-39.4	59.06
M-1	Point	1815.25	224.5	422.48	63	175.3	-76.18	-0.16	5.83	-12.68	-12.68	-	-	0	-26.2	65.9
M-1	Point	1815.25	224.5	422.48	125	164.5	-76.18	-0.62	-5.49	-9.83	-9.83	-	-	0	-16.1	56.29
M-1	Point	1815.25	224.5	422.48	250	149.1	-76.18	-2.06	-7.37	-10.77	-10.77	-	-	0	-8.6	44.13
M-1	Point	1815.25	224.5	422.48	500	160	-76.18	-5.08	-3.29	-17.76	-17.76	-	-	0	-3.2	54.49
M-1	Point	1815.25	224.5	422.48	1000	158.7	-76.18	-9.04	1.19	-24.01	-24.01	-	-	0	0	50.67
M-1	Point	1815.25	224.5	422.48	2000	155.2	-76.18	-16.37	1.75	-25	-25	-	-	0	1.2	40.6
M-1	Point	1815.25	224.5	422.48	4000	151.9	-76.18	-41.59	1.75	-25	-25	-	-	0	1	11.88
M-1	Point	1815.25	224.5	422.48	8000	147.6	-76.18	-139.09	1.75	-25	-25	-	-	0	-1.1	-92.02
M-1	Point	1815.25	224.5	422.48	16000	144.9	-76.18	-501.45	1.75	-25	-25	-	-	0	-6.6	-462.58
M-3	Point	2355.21	204.5	422.48	31.5	179.1	-78.44	-0.05	5.87	-4.96	-4.96	-	-	0	-39.4	62.12
M-3	Point	2355.21	204.5	422.48	63	175.3	-78.44	-0.21	5.87	-5.13	-5.13	-	-	0	-26.2	71.18
M-3	Point	2355.21	204.5	422.48	125	164.5	-78.44	-0.8	-5.48	0	0.02	-	-	0	-16.1	63.68
M-3	Point	2355.21	204.5	422.48	250	149.1	-78.44	-2.67	-7.36	0	1.3	-	-	0	-8.6	52.04
M-3	Point	2355.21	204.5	422.48	500	160	-78.44	-6.59	-3.28	-3.77	-3.77	-	-	0	-3.2	64.72
M-3	Point	2355.21	204.5	422.48	1000	158.7	-78.44	-11.72	1.2	-8.54	-8.54	-	-	0	0	61.2
M-3	Point	2355.21	204.5	422.48	2000	155.2	-78.44	-21.24	1.76	-10.52	-10.52	-	-	0	1.2	47.96
M-3	Point	2355.21	204.5	422.48	4000	151.9	-78.44	-53.96	1.76	-12.91	-12.91	-	-	0	1	9.35
M-3	Point	2355.21	204.5	422.48	8000	147.6	-78.44	-180.46	1.76	-15.58	-15.58	-	-	0	-1.1	-126.21
M-3	Point	2355.21	204.5	422.48	16000	144.9	-78.44	-650.6	1.76	-18.4	-18.4	-	-	0	-6.6	-607.39
M-2	Point	3025.51	223.45	422.48	31.5	179.1	-80.62	-0.07	5.9	-4.81	-4.81	-	-	0	-39.4	60.1
M-2	Point	3025.51	223.45	422.48	63	175.3	-80.62	-0.27	5.9	-4.86	-4.86	-	-	0	-26.2	69.25
M-2	Point	3025.51	223.45	422.48	125	164.5	-80.62	-1.03	-5.47	0	0.53	-	-	0	-16.1	61.29
M-2	Point	3025.51	223.45	422.48	250	149.1	-80.62	-3.43	-7.35	0	2.24	-	-	0	-8.6	49.11
M-2	Point	3025.51	223.45	422.48	500	160	-80.62	-8.47	-3.27	-2.16	-2.16	-	-	0	-3.2	62.29
M-2	Point	3025.51	223.45	422.48	1000	158.7	-80.62	-15.06	1.21	-5.99	-5.99	-	-	0	0	58.24
M-2	Point	3025.51	223.45	422.48	2000	155.2	-80.62	-27.28	1.77	-6.94	-6.94	-	-	0	1.2	43.33
M-2	Point	3025.51	223.45	422.48	4000	151.9	-80.62	-69.32	1.77	-8.38	-8.38	-	-	0	1	-3.65
M-2	Point	3025.51	223.45	422.48	8000	147.6	-80.62	-231.82	1.77	-10.33	-10.33	-	-	0	-1.1	-174.49
M-2	Point	3025.51	223.45	422.48	16000	144.9	-80.62	-835.77	1.77	-12.69	-12.69	-	-	0	-6.6	-789.01
M-4	Point	1496.32	461.64	422.48	31.5	179.1	-74.6	-0.03	5.79	-4.77	-4.77	-	-	0	-39.4	66.08
M-4	Point	1496.32	461.64	422.48	63	175.3	-74.6	-0.14	5.79	-4.77	-4.77	-	-	0	-26.2	75.38
M-4	Point	1496.32	461.64	422.48	125	164.5	-74.6	-0.51	-5.49	0	0.72	-	-	0	-16.1	67.79
M-4	Point	1496.32	461.64	422.48	250	149.1	-74.6	-1.71	-7.38	0	2.61	-	-	0	-8.6	56.8
M-4	Point	1496.32	461.64	422.48	500	160	-74.6	-4.24	-3.3	-1.47	-1.47	-	-	0	-3.2	73.19
M-4	Point	1496.32	461.64	422.48	1000	158.7	-74.6	-7.54	1.18	-4.77	-4.77	-	-	0	0	72.97
M-4	Point	1496.32	461.64	422.48	2000	155.2	-74.6	-13.65	1.74	-4.77	-4.77	-	-	0	1.2	65.11
M-4	Point	1496.32	461.64	422.48	4000	151.9	-74.6	-34.7	1.74	-4.77	-4.77	-	-	0	1	40.57
M-4	Point	1496.32	461.64	422.48	8000	147.6	-74.6	-116.03	1.74	-4.77	-4.77	-	-	0	-1.1	-47.17
M-4	Point	1496.32	461.64	422.48	16000	144.9	-74.6	-418.32	1.74	-4.77	-4.77	-	-	0	-6.6	-357.66

*** Objects ***

Receivers	x	y	Height
M-5	223928.1	-610911.14	1.5
M-1	225443.6	-611524.14	1.5
M-3	226117.97	-610772.77	1.5
M-2	224221.6	-607854.58	1.5
M-4	222268.48	-610680.36	1.5

Point Sources	x	y	Height	Lw	Hz	
Point	223773.84	-610840.15	2	179.1	31.5	
-	-	-	-	175.3	63	
-	-	-	-	164.5	125	
-	-	-	-	149.1	250	
-	-	-	-	160	500	
-	-	-	-	158.7	1000	
-	-	-	-	155.2	2000	
-	-	-	-	151.9	4000	
-	-	-	-	147.6	8000	
-	-	-	-	144.9	16000	

Ground Height Points	x	y	Height
-	224184.6	-610862.89	476
-	222718.9	-610748.33	453

Ground Height Lines	x	y	Height
-	228142.27	-608184.3	163
-	228096.44	-607996.43	
-	228056.79	-608030.11	
-	227867.84	-607998.96	
-	227783.14	-607962.9	
-	227764.98	-607900.76	
-	227725.83	-607855.82	
-	227677.51	-607934.28	
-	227572.23	-607992.12	
-	227490.28	-607963.37	
-	227517.44	-608042.55	
-	227477.91	-608065.46	
-	227447.82	-608137.86	
-	227408	-608177.63	
-	227415.31	-608225.32	
-	227457.18	-608263.06	
-	227430.8	-608338.26	
-	227439.32	-608450.77	
-	227409.06	-608466.02	
-	227353.72	-608437.72	
-	227305.09	-608437.79	
-	227201.5	-608493.14	
-	227106.6	-608576.84	
-	227082.01	-608643.83	
-	227030.78	-608706.72	
-	227038.67	-608726.57	
-	227021.11	-608726.27	
-	227054.22	-608829.54	
-	227015.64	-608961.29	
-	227032.62	-609000.13	
-	227057.38	-608891.54	
-	227130.55	-608863.14	
-	227152.94	-608822.53	
-	227185.04	-608807.35	
-	227212.25	-608705.02	
-	227319.14	-608661.01	
-	227337.98	-608544.23	
-	227430.26	-608523.48	
-	227522.52	-608458.37	
-	227606.82	-608498.99	
-	227636.3	-608539.75	
-	227685.57	-608552.53	
-	227688.31	-608534.96	
-	227790.68	-608484.91	
-	227767.27	-608445.41	
-	227773.37	-608410.63	
-	227868.15	-608303.31	
-	227949.96	-608324.38	
-	228023.19	-608388.42	
-	228029.94	-608494.48	
-	227931.78	-608569.37	
-	227844.56	-608535.21	
-	227817.03	-608543.98	
-	227865.26	-608607.17	
-	227833.36	-608634.03	
-	227804.45	-608732.23	
-	227733.99	-608740.36	
-	227729.55	-608768.11	
-	227761.48	-608809.68	
-	227794.51	-608813.37	
-	227804.09	-608885.23	
-	227843.99	-608932.05	
-	227831.88	-608965.5	
-	227921.87	-609211.3	
-	227984.49	-609287.66	
-	228048.91	-609428.08	
-	228151.41	-609532.15	
-	227260.69	-607809.32	183
-	227311.24	-608138.23	
-	227279.14	-608153.11	
-	227254.39	-608204.36	
-	227262.83	-608268.03	
-	227238.11	-608314.99	
-	227178.53	-608330.95	
-	227085.5	-608318.68	
-	227039.96	-608355.98	
-	226995.68	-608440.99	
-	226973.92	-608443.69	
-	226978.02	-608512.55	
-	226950.28	-608616.84	
-	226898.54	-608682.59	
-	226850.94	-608681.11	
-	226938.35	-608743.66	
-	226947.62	-608783.83	
-	226935.04	-608824.1	

-	225119.73	-608507.31			
-	225134.95	-608441.32			
-	225182.75	-608411.97			
-	225163.89	-608366.53			
-	225194.88	-608367.13			
-	225182.68	-608348.88			
-	225130.32	-608341.79			
-	225124.81	-608297.29			
-	225089.25	-608287.85			
-	225105.32	-608223.98			
-	225077.48	-608184.5			
-	225088.31	-608163.2			
-	225049	-608148.47			
-	225058.81	-608100.22			
-	225004.27	-607949.81			
-	225010.05	-607870.01			
-	224955.79	-607824.96			
-	225002.6	-607803.02			
-	224984.83	-607785.77			
-	225023.99	-607763.42			
-	225016.08	-607743.33			
-	225059.23	-607739.07			
-	225080.16	-607635.31			
-	225007.48	-607591.33			
-	224980.32	-607618.9			
-	224952.58	-607616.04			
-	224999.92	-607516.85			
-	225057.47	-607531.75			
-	225027.71	-607507.07			
-	225101.43	-607408.05			
-	225138.71	-607443.02			
-	225164.06	-607438.29			
-	225172.47	-607353.84			
-	225228.81	-607298.27			
-	225198.36	-607261.67			
-	225198.42	-607193.51			
-	225170.93	-607191.56			
-	225182.72	-607157.34			
-	225145.68	-607197.36			
-	225145	-607235.22			
-	225096.86	-607294.85			
-	225084.05	-607344.95			
-	225015.42	-607323.79			
-	224931.72	-607369.9			
-	224932.82	-607312.78			
-	224911.85	-607296.73			
-	224975.49	-607215.91			
-	224908.64	-607152.38			
-	224889.21	-607092.02			
-	224858.99	-607090.25			
-	224834.94	-606984.92			
-	224794.82	-606979.63			
-	224731.77	-607035.32			
-	224746.47	-607059.28			
-	224766.79	-607047.34			
-	224773.14	-607076.72			
-	224710.76	-607088.8			
-	224716.36	-607038.18			
-	224688.9	-607049.01			
-	224657.39	-607006.35			
-	224676.69	-606922.31			
-	224625.1	-606959.16			
-	224615.03	-607013.63			
-	224606.68	-606974.48			
-	224576.08	-606969.59			
-	224485.16	-607022.43			
-	224444.03	-607016.33			
-	224444.52	-606999.02			
-	224481.66	-607004.64			
-	224415.64	-606965.02			
-	224442.27	-606667.14			
-	224488.78	-606499.74			
-	224554.74	-606472.59			
-	224558.65	-606502.74			
-	224581.69	-606509.86			
-	224572.99	-606583.73			
-	224627.91	-606593.13			
-	224674.27	-606566.47			
-	224707.26	-606491.71			
-	224702.16	-606463.19			
-	224734.37	-606440.84			
-	224692.49	-606426.61			
-	224741.41	-606370.15			
-	224727.55	-606340.08			
-	224657.32	-606418.35			
-	224626.21	-606413.31			
-	224620.84	-606387.68			
-	224666.83	-606324.94	203		
-	228105.62	-607803.22			
-	228083.29	-607835.68			
-	228044.05	-607842.72			
-	227987.04	-607803.22	183		
-	227770.34	-607806.27			
-	227825.14	-607891.31			
-	227868.89	-607919.14			
-	228056.07	-607913.04			
-	228097.61	-607846.96			
-	228139.22	-607828.42	183		
-	228157.51	-610747.38			
-	228157.51	-610732.43	183		
-	228151.41	-609653.14			
-	228104.56	-609555.54			
-	228007.39	-609427.81			
-	227965.42	-609308.94			
-	227890.07	-609214.45			
-	227818.96	-609005.4			
-	227774.07	-608977.72			
-	227802.68	-608937.01			
-	227766.34	-608851.36			
-	227703.71	-608798.39			
-	226723.7	-608694.1			
-	226617.71	-608641.29			
-	226565.55	-608635.09			
-	226553.74	-608585.34			
-	226473.88	-608558.14			
-	226471.85	-608863			
-	226477.73	-608845.87			
-	226468.63	-608872.25			
-	226429.88	-608729.65			
-	226419.32	-608884.26			
-	226408.56	-608869.92			
-	226393.21	-608892.35			
-	226365.02	-608614.23			
-	226341.23	-608680.4			
-	226233.49	-608739.62			
-	226172.53	-608882.87			
-	226071.82	-608995.46			
-	226083.19	-609113.91			
-	226030.78	-609194.35			
-	226029.1	-609277.39			
-	225969.89	-609424.77			
-	225708.46	-609467.59			
-	225716.08	-609550.66			
-	225718.64	-609542.94			
-	225720.4	-609494.68			
-	225724.64	-609507.17			
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-	227010.2.1.0.0.0.0	-610976.5.6.9.1.7		
-	227010.2.1.0.0.0.0	-610976.5.6.8.9.5		
-	227010.2.1.0.0.0.0	-610976.5.6.8.7.3		
-	227010.2.1.0.0.0.0	-610976.5.6.8.5.1		
-	227010.2.1.0.0.0.0	-610976.5.6.8.2.9		
-	227010.2.1.0.0.0.0	-610976.5.6.8.0.7		
-	227010.2.1.0.0.0.0	-610976.5.6.7.8.5		
-	227010.2.1.0.0.0.0	-610976.5.6.7.6.3		
-	227010.2.1.0.0.0.0	-610976.5.6.7.4.1		
-	227010.2.1.0.0.0.0	-610976.5.6.7.1.9		
-	227010.2.1.0.0.0.0	-610976.5.6.6.9.7		
-	227010.2.1.0.0.0.0	-610976.5.6.6.7.5		
-	227010.2.1.0.0.0.0	-610976.5.6.6.5.3		
-	227010.2.1.0.0.0.0	-610976.5.6.6.3.1		
-	227010.2.1.0.0.0.0	-610976.5.6.6.0.8		
-	227010.2.1.0.0.0.0	-610976.5.6.5.8.6		
-	227010.2.1.0.0.0.0	-610976.5.6.5.6.4		
-	227010.2.1.0.0.0.0	-610976.5.6.5.4.2		
-	227010.2.1.0.0.0.0	-610976.5.6.5.1.0		
-	227010.2.1.0.0.0.0	-610976.5.6.4.9.8		
-	227010.2.1.0.0.0.0	-610976.5.6.4.7.6		
-	227010.2.1.0.0.0.0	-610976.5.6.4.5.4		
-	227010.2.1.0.0.0.0	-610976.5.6.4.3.2		
-	227010.2.1.0.0.0.0	-610976.5.6.4.0.9		
-	227010.2.1.0.0.0.0	-610976.5.6.3.8.7		
-	227010.2.1.0.0.0.0	-610976.5.6.3.6.5		
-	227010.2.1.0.0.0.0	-610976.5.6.3.4.3		
-	227010.2.1.0.0.0.0	-610976.5.6.3.2.1		
-	227010.2.1.0.0.0.0	-610976.5.6.2.9.8		
-	227010.2.1.0.0.0.0	-610976.5.6.2.7.6		
-	227010.2.1.0.0.0.0	-610976.5.6.2.5.4		
-	227010.2.1.0.0.0.0	-610976.5.6.2.3.2		
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-	227010.2.1.0.0.0.0	-610976.5.6.1.8.7		
-	227010.2.1.0.0.0.0	-610976.5.6.1.6.5		
-	227010.2.1.0.0.0.0	-610976.5.6.1.4.3		
-	227010.2.1.0.0.0.0	-610976.5.6.1.2.1		
-	227010.2.1.0.0.0.0	-610976.5.6.0.9.8		
-	227010.2.1.0.0.0.0	-610976.5.6.0.7.6		
-	227010.2.1.0.0.0.0	-610976.5.6.0.5.4		
-	227010.2.1.0.0.0.0	-610976.5.6.0.3.2		
-	227010.2.1.0.0.0.0	-610976.5.6.0.0.9		
-	227010.2.1.0.0.0.0	-610976.5.5.9.8.7		
-	227010.2.1.0.0.0.0	-610976.5.5.9.6.5		
-	227010.2.1.0.0.0.0	-610976.5.5.9.4.3		
-	227010.2.1.0.0.0.0	-610976.5.5.9.2.1		
-	227010.2.1.0.0.0.0	-610976.5.5.8.9.8		
-	227010.2.1.0.0.0.0	-610976.5.5.8.7.6		
-	227010.2.1.0.0.0.0	-610976.5.5.8.5.4		
-	227010.2.1.0.0.0.0	-610976.5.5.8.3.2		
-	227010.2.1.0.0.0.0	-610976.5.5.8.0.9		
-	227010.2.1.0.0.0.0	-610976.5.5.7.8.7		
-	227010.2.1.0.0.0.0	-610976.5.5.7.6.5		
-	227010.2.1.0.0.0.0	-610976.5.5.7.4.3		
-	227010.2.1.0.0.0.0	-610976.5.5.7.2.1		
-	227010.2.1.0.0.0.0	-610976.5.5.6.9.8		
-	227010.2.1.0.0.0.0	-610976.5.5.6.7.6		
-	227010.2.1.0.0.0.0	-610976.5.5.6.5.4		
-	227010.2.1.0.0.0.0	-610976.5.5.6.3.2		
-	227010.2.1.0.0.0.0	-610976.5.5.6.0.9		
-	227010.2.1.0.0.0.0	-610976.5.5.5.8.7		
-	227010.2.1.0.0.0.0	-610976.5.5.5.6.5		
-	227010.2.1.0.0.0.0	-610976.5.5.5.4.3		
-	227010.2.1.0.0.0.0	-610976.5.5.5.2.1		
-	227010.2.1.0.0.0.0	-610976.5.5.4.9.8		
-	227010.2.1.0.0.0.0	-610976.5.5.4.7.6		
-	227010.2.1.0.0.0.0	-610976.5.5.4.5.4		
-	227010.2.1.0.0.0.0	-610976.5.5.4.3.2		
-	227010.2.1.0.0.0.0	-610976.5.5.4.0.9		
-	227010.2.1.0.0.0.0	-610976.5.5.3.8.7		
-	227010.2.1.0.0.0.0	-610976.5.5.3.6.5		
-	227010.2.1.0.0.0.0	-610976.5.5.3.4.3		
-	227010.2.1.0.0.0.0	-610976.5.5.3.2.1		
-	227010.2.1.0.0.0.0	-610976.5.5.2.9.8		
-	227010.2.1.0.0.0.0	-610976.5.5.2.7.6		
-	227010.2.1.0.0.0.0	-610976.5.5.2.5.4		
-	227010.2.1.0.0.0.0	-610976.5.5.2.3.2		
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-	227010.2.1.0.0.0.0	-610976.5.5.1.8.7		
-	227010.2.1.0.0.0.0	-610976.5.5.1.6.5		
-	227010.2.1.0.0.0.0	-610976.5.5.1.4.3		
-	227010.2.1.0.0.0.0	-610976.5.5.1.2.1		
-	227010.2.1.0.0.0.0	-610976.5.5.0.9.8		
-	227010.2.1.0.0.0.0	-610976.5.5.0.7.6		
-	227010.2.1.0.0.0.0	-610976.5.5.0.5.4		
-	227010.2.1.0.0.0.0	-610976.5.5.0.3.2		
-	227010.2.1.0.0.0.0	-610976.5.5.0.0.9		
-	227010.2.1.0.0.0.0	-610976.5.4.9.8.7		
-	227010.2.1.0.0.0.0	-610976.5.4.9.6.5		
-	227010.2.1.0.0.0.0	-610976.5.4.9.4.3		
-	227010.2.1.0.0.0.0	-610976.5.4.9.2.1		
-	227010.2.1.0.0.0.0	-610976.5.4.8.9.8		
-	227010.2.1.0.0.0.0	-610976.5.4.8.7.6		
-	227010.2.1.0.0.0.0	-610976.5.4.8.5.4		
-	227010.2.1.0.0.0.0	-610976.5.4.8.3.2		
-	227010.2.1.0.0.0.0	-610976.5.4.8.0.9		
-	227010.2.1.0.0.0.0	-610976.5.4.7.8.7		
-	227010.2.1.0.0.0.0	-610976.5.4.7.6.5		
-	227010.2.1.0.0.0.0	-610976.5.4.7.4.3		
-	227010.2.1.0.0.0.0	-610976.5.4.7.2.1		
-	227010.2.1.0.0.0.0	-610976.5.4.6.9.8		
-	227010.2.1.0.0.0.0	-610976.5.4.6.7.6		
-	227010.2.1.0.0.0.0	-610976.5.4.6.5.4		
-	227010.2.1.0.0.0.0	-610976.5.4.6.3.2		
-	227010.2.1.0.0.0.0	-610976.5.4.6.0.9		
-	227010.2.1.0.0.0.0	-610976.5.4.5.8.7		
-	227010.2.1.0.0.0.0	-610976.5.4.5.6.5		
-	227010.2.1.0.0.0.0	-610976.5.4.5.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.4.4.9.8		
-	227010.2.1.0.0.0.0	-610976.5.4.4.7.6		
-	227010.2.1.0.0.0.0	-610976.5.4.4.5.4		
-	227010.2.1.0.0.0.0	-610976.5.4.4.3.2		
-	227010.2.1.0.0.0.0	-610976.5.4.4.0.9		
-	227010.2.1.0.0.0.0	-610976.5.4.3.8.7		
-	227010.2.1.0.0.0.0	-610976.5.4.3.6.5		
-	227010.2.1.0.0.0.0	-610976.5.4.3.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.4.2.9.8		
-	227010.2.1.0.0.0.0	-610976.5.4.2.7.6		
-	227010.2.1.0.0.0.0	-610976.5.4.2.5.4		
-	227010.2.1.0.0.0.0	-610976.5.4.2.3.2		
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-	227010.2.1.0.0.0.0	-610976.5.4.1.6.5		
-	227010.2.1.0.0.0.0	-610976.5.4.1.4.3		
-	227010.2.1.0.0.0.0	-610976.5.4.1.2.1		
-	227010.2.1.0.0.0.0	-610976.5.4.0.9.8		
-	227010.2.1.0.0.0.0	-610976.5.4.0.7.6		
-	227010.2.1.0.0.0.0	-610976.5.4.0.5.4		
-	227010.2.1.0.0.0.0	-610976.5.4.0.3.2		
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-	227010.2.1.0.0.0.0	-610976.5.3.9.4.3		
-	227010.2.1.0.0.0.0	-610976.5.3.9.2.1		
-	227010.2.1.0.0.0.0	-610976.5.3.8.9.8		
-	227010.2.1.0.0.0.0	-610976.5.3.8.7.6		
-	227010.2.1.0.0.0.0	-610976.5.3.8.5.4		
-	227010.2.1.0.0.0.0	-610976.5.3.8.3.2		
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-	227010.2.1.0.0.0.0	-610976.5.3.7.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.3.6.5.4		
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-	227010.2.1.0.0.0.0	-610976.5.3.5.6.5		
-	227010.2.1.0.0.0.0	-610976.5.3.5.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.3.4.7.6		
-	227010.2.1.0.0.0.0	-610976.5.3.4.5.4		
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-	227010.2.1.0.0.0.0	-610976.5.3.3.8.7		
-	227010.2.1.0.0.0.0	-610976.5.3.3.6.5		
-	227010.2.1.0.0.0.0	-610976.5.3.3.4.3		
-	227010.2.1.0.0.0.0	-610976.5.3.3.2.1		
-	227010.2.1.0.0.0.0	-610976.5.3.2.9.8		
-	227010.2.1.0.0.0.0	-610976.5.3.2.7.6		
-	227010.2.1.0.0.0.0	-610976.5.3.2.5.4		
-	227010.2.1.0.0.0.0	-610976.5.3.2.3.2		
-	227010.2.1.0.0.0.0	-610976.5.3.2.0.9		
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-	227010.2.1.0.0.0.0	-610976.5.3.1.6.5		
-	227010.2.1.0.0.0.0	-610976.5.3.1.4.3		
-	227010.2.1.0.0.0.0	-610976.5.3.1.2.1		
-	227010.2.1.0.0.0.0	-610976.5.3.0.9.8		
-	227010.2.1.0.0.0.0	-610976.5.3.0.7.6		
-	227010.2.1.0.0.0.0	-610976.5.3.0.5.4		
-	227010.2.1.0.0.0.0	-610976.5.3.0.3.2		
-	227010.2.1.0.0.0.0	-610976.5.3.0.0.9		
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-	227010.2.1.0.0.0.0	-610976.5.2.9.6.5		
-	227010.2.1.0.0.0.0	-610976.5.2.9.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.2.8.7.6		
-	227010.2.1.0.0.0.0	-610976.5.2.8.5.4		
-	227010.2.1.0.0.0.0	-610976.5.2.8.3.2		
-	227010.2.1.0.0.0.0	-610976.5.2.8.0.9		
-	227010.2.1.0.0.0.0	-610976.5.2.7.8.7		
-	227010.2.1.0.0.0.0	-610976.5.2.7.6.5		
-	227010.2.1.0.0.0.0	-610976.5.2.7.4.3		
-	227010.2.1.0.0.0.0	-610976.5.2.7.2.1		
-	227010.2.1.0.0.0.0	-610976.5.2.6.9.8		
-	227010.2.1.0.0.0.0	-610976.5.2.6.7.6		
-	227010.2.1.0.0.0.0	-610976.5.2.6.5.4		
-	227010.2.1.0.0.0.0	-610976.5.2.6.3.2		
-	227010.2.1.0.0.0.0	-610976.5.2.6.0.9		
-	227010.2.1.0.0.0.0	-610976.5.2.5.8.7		
-	227010.2.1.0.0.0.0	-610976.5.2.5.6.5		
-	227010.2.1.0.0.0.0	-610976.5.2.5.4.3		
-	227010.2.1.0.0.0.0	-610976.5.2.5.2.1		
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-	227010.2.1.0.0.0.0	-610976.5.2.4.7.6		
-	227010.2.1.0.0.0.0	-610976.5.2.4.5.4		
-	227010.2.1.0.0.0.0	-610976.5.2.4.3.2		
-	227010.2.1.0.0.0.0	-610976.5.2.4.0.9		
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-	227010.2.1.0.0.0.0	-610976.5.2.3.6.5		
-	227010.2.1.0.0.0.0	-610976.5.2.3.4.3		
-	227010.2.1.0.0.0.0	-610976.5.2.3.2.1		
-	227010.2.1.0.0.0.0	-610976.5.2.2.9.8		
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-	227010.2.1.0.0.0.0	-610976.5.2.1.4.3		
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-	227010.2.1.0.0.0.0	-610976.5.2.0.7.6		
-	227010.2.1.0.0.0.0	-610976.5.2.0.5.4		
-	227010.2.1.0.0.0.0	-610976.5.2.0.3.2		
-	227010.2.1.0.0.0.0	-610976.5.2.0.0.9		
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-	227010.2.1.0.0.0.0	-610976.5.1.9.6.5		
-	227010.2.1.0.0.0.0	-610976.5.1.9.4.3		
-	227010.2.1.0.0.0.0	-610976.5.1.9.2.1		
-	227010.2.1.0.0.0.0	-610976.5.1.8.9.8		
-	227010.2.1.0.0.0.0	-610976.5.1.8.7.6		
-	227010.2.1.0.0.0.0	-610976.5.1.8.5.4		
-	227010.2.1.0.0.0.0	-610976.5.1.8.3.2		
-	227010.2.1.0.0.0.0	-610976.5.1.8.0.9		
-	227010.2.1.0.0.0.0	-610976.5.1.7.8.7		
-	227010.2.1.0.0.0.0	-610976.5.1.7.6.5		
-	227010.2.1.0.0.0.0	-610976.5.1.7.4.3		
-	227010.2.1.0.0.0.0	-610976.5.1.7.2.1		
-	227010.2.1.0.0.0.0	-610976.5.1.6.9.8		
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-	220086.84	-609416.04	
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-	219936.8	-609423.55	
-	219902.69	-609354.66	
-	221508.23	-609083.38	643
-	221485.4	-609020.27	
-	221509.27	-608954.76	
-	221581.37	-608901.92	
-	221630.31	-608899.17	
-	221717.08	-608979.75	
-	221769.54	-609090.66	
-	221774.95	-609162.91	
-	221713.17	-609226.8	
-	221619.53	-609256.99	
-	221573.94	-609148.2	
-	219159.79	-611493.89	663
-	219214.44	-611515.31	
-	219380.32	-611680.76	
-	219498.44	-611649.83	
-	219649.14	-611721.69	
-	219729.71	-611954.59	
-	219721.21	-612018.04	
-	219683.36	-612067.78	
-	219595.88	-612087.72	
-	219515.83	-612068.03	
-	219454.87	-612165.57	
-	219315.35	-612271.72	
-	219318.36	-612356.94	
-	219153.7	-610132.63	663
-	219197.95	-610171.54	
-	219184.79	-610296	
-	219153.7	-610357.67	
-	220058.25	-609351.61	663
-	220054.29	-609389.51	
-	219981.88	-609409.55	
-	219949.01	-609390.15	
-	219944.86	-609354.66	
-	221546.95	-609083.38	663
-	221513.84	-609046.61	
-	221510.12	-608992.36	
-	221622.73	-608914.45	
-	221684.84	-608975.09	
-	221740.36	-609112.59	
-	221707.26	-609153.88	
-	221645.02	-609160.4	
-	219159.79	-611543.96	683
-	219200.35	-611540.97	
-	219262.84	-611640.01	
-	219370.85	-611716.83	
-	219480.13	-611691.62	
-	219598.7	-611723.01	
-	219637.59	-611784.2	
-	219691.64	-611966.77	
-	219659.58	-612022.98	
-	219489.33	-612023.54	
-	219439.58	-612101.51	
-	219305.85	-612207.31	
-	219226.01	-612356.94	
-	219159.79	-611577.57	703
-	219195.32	-611594.59	
-	219264.55	-611686.65	
-	219377.68	-611750.27	
-	219470.87	-611721.86	
-	219568.22	-611753.51	
-	219651.15	-611938.99	
-	219635.29	-611957.63	
-	219462.23	-611972.41	
-	219418.88	-612058.25	
-	219266.53	-612189.36	
-	219230.28	-612295.29	
-	219165.89	-612356.24	
-	219162.84	-611618.51	723
-	219238.66	-611715.76	
-	219378.09	-611774.28	
-	219470.74	-611748.98	
-	219528.44	-611758.58	
-	219557.27	-611789.93	
-	219588.26	-611886.1	
-	219577.59	-611908.8	
-	219446.39	-611905.92	
-	219377.53	-612047.47	
-	219293.05	-612104.46	
-	219165.89	-612265.72	
-	219162.84	-611700.36	743
-	219267.69	-611781.43	
-	219336.58	-611792.65	
-	219393.02	-611860.14	
-	219354.81	-612009.42	
-	219165.89	-612173.36	
-	219162.84	-611751.23	763
-	219323.06	-611872.18	
-	219336.61	-611915.89	
-	219307.18	-612007.58	
-	219165.89	-612123.15	
-	219162.84	-611807.48	783
-	219270.44	-611876.23	
-	219287.85	-611929.63	
-	219266.74	-611988.42	
-	219162.84	-612072.77	
-	219162.84	-611859.33	803
-	219220.49	-611892.1	
-	219231.48	-611930.24	
-	219220.29	-611967.49	
-	219162.84	-612024	
-	223733.07	-610796.57	420
-	223735.15	-610837.38	
-	223715.21	-610861.92	
-	223742.95	-610882.22	
-	223771.02	-610873.83	
-	223798.61	-610864.32	
-	223804.87	-610858.06	
-	223809.74	-610841.82	
-	223812.29	-610827.68	
-	223812.76	-610811.91	
-	223810.9	-610800.55	
-	223808.58	-610789.65	
-	223805.11	-610767.62	
-	223805.34	-610767.62	
-	223734.09	-610868.46	420
-	223763.47	-610853.96	
-	223792.34	-610843.21	
-	223796.22	-610833.83	
-	223799.34	-610840.15	424
-	223793.15	-610857.71	
-	223744.84	-610874.83	

*** Configuration ***
Heights for all calculation results are absolute
0.7G Ground Factor
20.0Â°C Temperature
70% Humidity
Results are A-weighted
Results are rounded to 0 decimal places
Second order reflections are included
Reflections are only considered at a distance of 1m or greater from a reflector (facade level)
ISO9613-2 barrier attenuation limit (20/25dB) is enabled
Vertical edges (lateral paths) are included
Limited to convex paths
Following ISO17534-3 recommendation 5.2
Ground reflections are screened (original ISO9613-2 method)

*** Key ***

Lw	Sound Power Level (dB)
Ad	Distance attenuation aka geometrical divergence" ISO9613-2 (dB)"
Ab	Barrier attenuation ISO9613-2 (dB)
Ag	Ground effect ISO9613-2 (dB)
Aa	Air absorption ISO9613-1 (dB)

Noise Mapping Results / No Berm

*** Receiver Results - Summary ***

Receiver Name	Height (m)	Total dB(A)	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
M-1	1.5	75.44	64.22	73.15	65.55	54.79	66.99	64.12	52.61	21	-86.65	-463.6
M-2	1.5	71	60.01	69.12	61.24	49.06	61.66	57.2	41.75	-5.92	-177.9	-795.41
M-3	1.5	73.5	62.23	71.3	63.8	52.17	64.98	61.55	48.45	10.25	-123.75	-599.18
M-4	1.5	79.49	66.08	75.38	67.79	56.8	73.18	72.96	65.1	40.56	-47.19	-357.75
M-5	1.5	107.17	88.55	97.93	92.78	77.57	97.51	103.37	100.95	95.19	80.07	39.47

*** Receiver Results - Sources Analysis ***

Receiver Name	Source
M-1 [1.5m]	75.44
M-2 [1.5m]	71
M-3 [1.5m]	73.5
M-4 [1.5m]	79.49
M-5 [1.5m]	107.17

*** Receiver Results - Full Detail ***

Receiver Name	Source Name	Distance to source (m)	Height including ground level (m)	Source height including ground level (m)	Frequency (Hz)	Lw	Ad	Aa	Ag	Ab (total)	Ab (top edge)	Ab (lateral 1)	Ab (lateral 2)	Adjustment	A-Weighting	Lp
M-1	Source	1815.25	224.5	421.21	31.5	179.1	-76.26	-0.04	5.83	-5	-5	-	-	0	-39.4	64.22
M-1	Source	1815.25	224.5	421.21	63	175.3	-76.26	-0.16	5.83	-5.35	-5.35	-	-	0	-26.2	73.15
M-1	Source	1815.25	224.5	421.21	125	164.5	-76.26	-0.62	-5.49	-0.47	-0.47	-	-	0	-16.1	65.55
M-1	Source	1815.25	224.5	421.21	250	149.1	-76.26	-2.08	-7.37	0	0.41	-	-	0	-8.6	54.79
M-1	Source	1815.25	224.5	421.21	500	160	-76.26	-5.13	-3.29	-5.13	-5.13	-	-	0	-3.2	66.99
M-1	Source	1815.25	224.5	421.21	1000	158.7	-76.26	-9.12	1.19	-10.38	-10.38	-	-	0	0	64.12
M-1	Source	1815.25	224.5	421.21	2000	155.2	-76.26	-16.52	1.75	-12.75	-12.75	-	-	0	1.2	52.61
M-1	Source	1815.25	224.5	421.21	4000	151.9	-76.26	-41.99	1.75	-15.4	-15.4	-	-	0	1	21
M-1	Source	1815.25	224.5	421.21	8000	147.6	-76.26	-140.42	1.75	-18.22	-18.22	-	-	0	-1.1	-86.65
M-1	Source	1815.25	224.5	421.21	16000	144.9	-76.26	-506.25	1.75	-21.13	-21.13	-	-	0	-6.6	-463.6
M-2	Source	3025.51	223.45	421.21	31.5	179.1	-80.65	-0.07	5.9	-4.86	-4.86	-	-	0	-39.4	60.01
M-2	Source	3025.51	223.45	421.21	63	175.3	-80.65	-0.27	5.9	-4.94	-4.94	-	-	0	-26.2	69.12
M-2	Source	3025.51	223.45	421.21	125	164.5	-80.65	-1.03	-5.47	0	0.36	-	-	0	-16.1	61.24
M-2	Source	3025.51	223.45	421.21	250	149.1	-80.65	-3.44	-7.35	0	1.93	-	-	0	-8.6	49.06
M-2	Source	3025.51	223.45	421.21	500	160	-80.65	-8.5	-3.27	-2.71	-2.71	-	-	0	-3.2	61.66
M-2	Source	3025.51	223.45	421.21	1000	158.7	-80.65	-15.13	1.21	-6.93	-6.93	-	-	0	0	57.2
M-2	Source	3025.51	223.45	421.21	2000	155.2	-80.65	-27.4	1.77	-8.36	-8.36	-	-	0	1.2	41.75
M-2	Source	3025.51	223.45	421.21	4000	151.9	-80.65	-69.63	1.77	-10.3	-10.3	-	-	0	1	-5.92
M-2	Source	3025.51	223.45	421.21	8000	147.6	-80.65	-232.86	1.77	-12.66	-12.66	-	-	0	-1.1	-177.9
M-2	Source	3025.51	223.45	421.21	16000	144.9	-80.65	-839.53	1.77	-15.3	-15.3	-	-	0	-6.6	-795.41
M-3	Source	2355.21	204.5	421.21	31.5	179.1	-78.33	-0.05	5.86	-4.95	-4.95	-	-	0	-39.4	62.23
M-3	Source	2355.21	204.5	421.21	63	175.3	-78.33	-0.21	5.86	-5.12	-5.12	-	-	0	-26.2	71.3
M-3	Source	2355.21	204.5	421.21	125	164.5	-78.33	-0.79	-5.48	0	0.04	-	-	0	-16.1	63.8
M-3	Source	2355.21	204.5	421.21	250	149.1	-78.33	-2.63	-7.36	0	1.34	-	-	0	-8.6	52.17
M-3	Source	2355.21	204.5	421.21	500	160	-78.33	-6.51	-3.28	-3.7	-3.7	-	-	0	-3.2	64.98
M-3	Source	2355.21	204.5	421.21	1000	158.7	-78.33	-11.58	1.2	-8.44	-8.44	-	-	0	0	61.55
M-3	Source	2355.21	204.5	421.21	2000	155.2	-78.33	-20.98	1.76	-10.4	-10.4	-	-	0	1.2	48.45
M-3	Source	2355.21	204.5	421.21	4000	151.9	-78.33	-53.3	1.76	-12.77	-12.77	-	-	0	1	10.25
M-3	Source	2355.21	204.5	421.21	8000	147.6	-78.33	-178.26	1.76	-15.42	-15.42	-	-	0	-1.1	-123.75
M-3	Source	2355.21	204.5	421.21	16000	144.9	-78.33	-642.67	1.76	-18.24	-18.24	-	-	0	-6.6	-599.18
M-4	Source	1496.32	461.64	421.21	31.5	179.1	-74.61	-0.03	5.79	-4.77	-4.77	-	-	0	-39.4	66.08
M-4	Source	1496.32	461.64	421.21	63	175.3	-74.61	-0.14	5.79	-4.77	-4.77	-	-	0	-26.2	75.38
M-4	Source	1496.32	461.64	421.21	125	164.5	-74.61	-0.51	-5.49	0	0.72	-	-	0	-16.1	67.79
M-4	Source	1496.32	461.64	421.21	250	149.1	-74.61	-1.72	-7.38	0	2.61	-	-	0	-8.6	56.8
M-4	Source	1496.32	461.64	421.21	500	160	-74.61	-4.24	-3.3	-1.47	-1.47	-	-	0	-3.2	73.18
M-4	Source	1496.32	461.64	421.21	1000	158.7	-74.61	-7.54	1.18	-4.77	-4.77	-	-	0	0	72.96
M-4	Source	1496.32	461.64	421.21	2000	155.2	-74.61	-13.66	1.74	-4.77	-4.77	-	-	0	1.2	65.1
M-4	Source	1496.32	461.64	421.21	4000	151.9	-74.61	-34.7	1.74	-4.77	-4.77	-	-	0	1	40.56
M-4	Source	1496.32	461.64	421.21	8000	147.6	-74.61	-116.05	1.74	-4.77	-4.77	-	-	0	-1.1	-47.19
M-4	Source	1496.32	461.64	421.21	16000	144.9	-74.61	-418.41	1.74	-4.77	-4.77	-	-	0	-6.6	-357.75
M-5	Source	169.84	419.14	421.21	31.5	179.1	-55.21	0	4.06	0	-	-	-	0	-39.4	88.55
M-5	Source	169.84	419.14	421.21	63	175.3	-55.21	-0.01	4.06	0	-	-	-	0	-26.2	97.93
M-5	Source	169.84	419.14	421.21	125	164.5	-55.21	-0.06	-0.36	0	-	-	-	0	-16.1	92.78
M-5	Source	169.84	419.14	421.21	250	149.1	-55.21	-0.18	-7.54	0	-	-	-	0	-8.6	77.57
M-5	Source	169.84	419.14	421.21	500	160	-55.21	-0.45	-3.62	0	-	-	-	0	-3.2	97.51
M-5	Source	169.84	419.14	421.21	1000	158.7	-55.21	-0.81	0.68	0	-	-	-	0	0	103.37
M-5	Source	169.84	419.14	421.21	2000	155.2	-55.21	-1.46	1.22	0	-	-	-	0	1.2	100.95
M-5	Source	169.84	419.14	421.21	4000	151.9	-55.21	-3.72	1.22	0	-	-	-	0	1	95.19
M-5	Source	169.84	419.14	421.21	8000	147.6	-55.21	-12.44	1.22	0	-	-	-	0	-1.1	80.07
M-5	Source	169.84	419.14	421.21	16000	144.9	-55.21	-44.84	1.22	0	-	-	-	0	-6.6	39.47

*** Objects ***

Receivers	x	y	Height
M-5	223928.1	-610911.14	1.5
M-1	225443.6	-611524.14	1.5
M-3	226117.97	-610772.77	1.5
M-2	224221.6	-607854.58	1.5
M-4	222268.48	-610680.36	1.5

Point Sources	x	y	Height	Lw	Hz
Source	110.34	-11.5	2	179.1	31.5
-	-	-		175.3	63
-	-	-		164.5	125
-	-	-		149.1	250
-	-	-		160	500
-	-	-		158.7	1000
-	-	-		155.2	2000
-	-	-		151.9	4000
-	-	-		147.6	8000
-	-	-		144.9	16000

Ground Height Points	x	y	Height
-	134.08	295.24	480
-	514.08	-44.76	475

Ground Height Lines	x	y	Height
-	4476.27	2642.71	163
-	4430.44	2830.57	
-	4390.79	2796.89	
-	4201.84	2828.04	
-	4117.14	2864.1	
-	4098.98	2926.24	
-	4059.83	2971.18	
-	4011.51	2892.73	
-	3906.23	2834.88	
-	3824.28	2863.63	
-	3851.44	2784.45	
-	3811.91	2761.54	
-	3781.83	2689.14	
-	3742	2649.37	
-	3749.31	2601.68	
-	3791.18	2563.94	
-	3764.8	2488.74	
-	3773.32	2376.23	
-	3743.06	2360.98	
-	3687.72	2389.28	
-	3639.09	2389.21	
-	3535.5	2333.86	
-	3440.6	2250.16	
-	3416.01	2183.17	
-	3364.78	2120.28	
-	3372.67	2100.43	
-	3355.11	2100.73	
-	3388.22	1997.46	
-	3349.65	1865.71	
-	3366.62	1826.87	
-	3391.38	1935.46	
-	3464.55	1963.86	
-	3486.94	2004.47	
-	3519.04	2019.65	
-	3546.25	2121.98	
-	3653.14	2165.99	
-	3671.98	2282.77	
-	3764.26	2303.52	
-	3856.52	2368.63	
-	3940.82	2328.01	
-	3970.3	2287.25	
-	4019.57	2274.47	
-	4022.31	2292.04	
-	4124.68	2342.09	
-	4101.27	2381.59	
-	4107.37	2416.37	
-	4202.15	2523.69	
-	4283.96	2502.63	
-	4357.19	2438.58	
-	4363.94	2332.52	
-	4265.78	2257.63	
-	4178.56	2291.79	
-	4151.03	2283.02	
-	4199.26	2219.83	
-	4167.36	2192.97	
-	4138.45	2094.77	
-	4067.99	2086.64	
-	4063.55	2058.89	
-	4095.48	2017.32	
-	4128.51	2013.63	
-	4138.09	1941.77	
-	4178	1894.95	
-	4165.88	1861.5	
-	4255.87	1615.7	
-	4318.49	1539.34	
-	4382.92	1398.92	
-	4485.41	1294.85	
-	3594.69	3017.68	183
-	3645.24	2688.77	
-	3613.14	2673.89	
-	3588.39	2622.64	
-	3596.83	2558.97	
-	3572.11	2512.01	
-	3512.54	2496.05	
-	3419.5	2508.32	
-	3373.96	2471.03	
-	3329.68	2386.01	
-	3307.92	2383.31	
-	3312.02	2314.45	
-	3284.28	2210.16	
-	3232.54	2144.41	
-	3184.94	2145.89	
-	3272.35	2083.34	
-	3281.62	2043.17	
-	3269.04	2002.9	
-	3244.3	1991.11	
-	3235.51	1914.5	
-	3207.34	1915.27	
-	3195.96	1871.49	
-	3135.62	1808.15	
-	3165.66	1804.61	
-	3144.44	1776.45	
-	3162.67	1743.88	
-	3083.12	1685.93	
-	3063.16	1693.4	
-	2964.53	1640.22	
-	2870.85	1648.8	
-	2830.17	1605.47	
-	2799.61	1632.88	
-	2750.73	1633.43	
-	2728.07	1601.99	
-	2736.24	1570.55	
-	2717.33	1576.64	
-	2772.53	1483.59	
-	2770.73	1356.54	
-	2786.68	1338.7	
-	2824.25	1350.47	
-	2866.72	1329.11	
-	2896.16	1243.66	
-	2888.14	1125.91	
-	2923.34	1077.52	
-	2956.56	955.85	
-	2996.48	884.09	
-	3106	804.81	
-	3159.44	791.41	
-	3258.78	824.31	
-	3300.04	766.56	
-	3308.9	780.48	
-	3309.72	645.39	
-	3211.17	593.27	
-	3183.95	552.44	
-	3192.45	512.32	
-	3233.64	466.61	
-	3233.39	431.04	
-	3247.93	445.2	
-	3306.57	429.55	
-	3296.6	456.5	

-	3314.19	464.32		
-	3272.53	524.22		
-	3289.52	507.2		
-	3327.76	570.78		
-	3426.14	650.88		
-	3459.02	713.82		
-	3478.57	818.24		
-	3469.96	930.75		
-	3492.7	1027.54		
-	3535.9	1105.11		
-	3512.35	1196.06		
-	3559.09	1259.78		
-	3574.64	1319.83		
-	3538.39	1332.32		
-	3522.64	1284.06		
-	3496.08	1276.34		
-	3342.46	1359.41		
-	3308.89	1402.24		
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-	3699.02	2212.77		
-	3727.21	1934.65		
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-	3753.32	1942.74		
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-	4159.14	2935.69		
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*** Configuration ***
Heights for all calculation results are absolute
0.7G Ground Factor
20.0Â°C Temperature
70% Humidity
Results are A-weighted
Results are rounded to 0 decimal places
Second order reflections are included
Reflections are only considered at a distance of 1m or greater from a reflector (facade level)
ISO9613-2 barrier attenuation limit (20/25dB) is enabled
Vertical edges (lateral paths) are included
Limited to convex paths
Following ISO17534-3 recommendation 5.2
Ground reflections are screened (original ISO9613-2 method)

*** Key ***

Lw	Sound Power Level (dB)
Ad	Distance attenuation aka geometrical divergence" ISO9613-2 (dB)"
Ab	Barrier attenuation ISO9613-2 (dB)
Ag	Ground effect ISO9613-2 (dB)
Aa	Air absorption ISO9613-1 (dB)

RESPONSE TO SIXTH NOTICE OF INCOMPLETE PERMIT APPLICATION

New York State
Adirondack
Park Agency

KATHY HOCHUL
Governor

BARBARA RICE
Executive Director

NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency

RECEIVED

Date: September 11, 2025

SIXTH NOTICE OF INCOMPLETE PERMIT APPLICATION

APA Project No. 2021-0276

Project Sponsor:	**Authorized Representative:**
Michael Hopmeier 620 Herndon Parkway, Suite 120A Herndon, VA 20170	Matthew D. Norfolk, Esq. 1936 Saranac Ave, Suite 106 Lake Placid, NY 12946

Date Permit Application Received: November 19, 2021
Type of Project: Commercial Use – Munitions testing facility
Location of Project: Town of Lewis, Essex County
Land Use Area: Rural Use
Tax Map No.: 38.1-1-31.000 & 38.1-1-29.000

Thank you for the recent submission in relation to APA Project No. 2021-0276, received by the Agency on July 10, 2025.

The following clarification is necessary to review the application:

- Please identify any solvents, lubricants, coatings, etc. that are applied to the inside or outside of the 155mm howitzer barrel assembly and/or used in the testing process. Please describe the process and location for application of any of these products, including any details related to transportation into and/or out of the proposed site, storage, and/or disposal. Please identify the products proposed to be used and their chemical composition, including but not limited to product labels, material safety data sheets, or other information sufficient to identify the chemical compounds being applied, transported, stored, and/or disposed of as part of the proposed project.

Response: The Applicant objects to this latest request as it is in violation of Executive Law §809(b). The Agency is prohibited to issue multiple notices of incomplete application and request the Applicant to supplement its application unless there is a change in the application or the proposed project or information was received by the Agency that gives cause for a notice of incomplete application and the request(s) therein. Here, the application, as supplemented by the Applicant with its responses to the five previous notices of incomplete permit application, provides all the information required by statute and the Agency previously. The Agency was required to request information about any products applied to the barrel of the subject howitzer with its first notice of incomplete application. There has been no change in the application or the proposed project nor new information provided since the submission of the application to give the Agency

cause to now seek, nearly four years later, information about products Agency Staff speculates are applied to the barrel. The Agency is abusing its discretion, in violation of the Adirondack Park Agency Act (Executive Law, Article 27), with its random, endless requests for information and clarification.

Notwithstanding the foregoing and without waiving the Applicant's objection expressed above, there are no solvents, lubricants, coatings or other products that are applied to the inside or outside of the howitzer barrel nor used in the testing procedure. As a consequence, there are no such products transported in or out of the proposed site nor stored or disposed of on the proposed site. The barrel does not require cleaning given the minimal use or limited number of shots required for testing. As stated in previous submissions, there will be 30 shots per year for five years resulting in 7,500 milliseconds of impulse sound over the life of the proposed project.

Norfolk Beier PLLC

By: 
_____

EXHIBIT H

Powell, Teri

From: Matthew D. Norfolk <mnorfolk@norfolkbeier.com>
Sent: Friday, January 2, 2026 5:14 PM
To: VanCott, Paul
Cc: Barbara.Rice@apa.ny.gov; Greenwood, David N (DEC); Sullivan, Grace (APA)
Subject: Re: APA Project No. 2021-0276

I'll look at what you sent, but the Council is not a party to the proceeding. It has no standing to raise any perceived conflicts.

Have a great weekend,
Matt

Sincerely,
Matthew D. Norfolk, Esq.
NORFOLK BEIER PLLC
O: 518.302.8080
F: 518.302.7100
A: The Outpost Plaza
1936 Saranac Avenue, Ste.106
Lake Placid, NY 12946
E: mnorfolk@norfolkbeier.com

From: VanCott, Paul <PVanCott@woh.com>
Sent: Friday, January 2, 2026 4:04 PM
To: Matthew D. Norfolk <mnorfolk@norfolkbeier.com>
Cc: Barbara.Rice@apa.ny.gov <Barbara.Rice@apa.ny.gov>
Subject: APA Project No. 2021-0276

Please see the attached correspondence in reference to the above matter.

Thank you.

Paul

Paul Van Cott | **Whiteman Osterman & Hanna LLP**
Of Counsel
One Commerce Plaza | Albany | New York | 12260
| o | 518.487.7733| f | 518.487.7777
| e | pvancott@woh.com | w | www.woh.com