

1 - Exhibit B

**STATE OF WYOMING
DEPARTMENT OF ADMINISTRATION AND INFORMATION
PROCUREMENT SECTION
700 WEST 21st STREET
CHEYENNE, WY 82002-0060**

**REQUEST FOR PROPOSAL
NO. 0208-W**

**PINEDALE ANTICLINE PROJECT AREA NOISE MONITORING FOR THE
PINEDALE ANTICLINE PROJECT OFFICE**

**OPENING DATE AND TIME
FEBRUARY 28, 2013 – 2:00 P.M.**

**PURCHASING REPRESENTATIVE: NICHOLAS KOENIGS
TELEPHONE NO. (307) 777-6707**

**GAME AND FISH DEPARTMENT
REPRESENTATIVE: THERESE HARTMAN
WILDLIFE MITIGATION BIOLOGIST**

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R.F.P. NO. 0208-W

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I. REQUEST FOR PROPOSAL

1. SUBMISSION OF PROPOSALS:

Sealed Proposals, one (1) original and five (5) copies will be received for providing services for **PINEDALE ANTICLINE PROJECT AREA NOISE MONITORING FOR THE PINEDALE ANTICLINE PROJECT OFFICE** for the State of Wyoming, Wyoming Game and Fish Department by the Wyoming Department of Administration and Information, Procurement Section, 700 West 21st Street, Cheyenne, Wyoming 82002 until **FEBRUARY 28, 2013 2:00 p.m.**, at which time they will be publicly opened.

NOTE: Packages not containing the required number of copies will be rejected.

- 1.1. No proposal will be considered which is not accompanied by the attached Proposal Price Sheet and signed by the proper official of the firm. Proposals will not be accepted by fax or Email.
- 1.2. Proposals must be received in the office of the Procurement Section on or before the time and date specified. Proposals received after the time and date specified will not be considered and will be returned unopened.

2. MODIFICATIONS OR WITHDRAWAL OF PROPOSALS:

- 2.1. A proposal that is in the possession of the Procurement Section may be altered by a letter bearing the signature or name of the authorized person, provided it is received PRIOR to the date and time of the opening. A letter should not reveal the proposal pricing but should indicate the addition, subtraction or other changes. FAX and E-mail alterations are acceptable. It is the proposer's responsibility to confirm receipt of this alteration with the Procurement Office. Telephone or verbal alterations will not be accepted.
- 2.2. A proposal that is in the possession of the Procurement Section may be withdrawn by the proposer up to the time of the opening. Failure of the successful proposer to furnish the service awarded as a result of this advertisement shall eliminate the proposer from the active proposers list for a period of time as determined by the Procurement Section.

3. PREPARATION OF PROPOSALS:

- 3.1. No proposal will be considered which modifies, in any manner, any of the provisions, specifications, or minimum requirements of the Request for Proposal.
- 3.2. In case of error in the extension of prices in the proposal, unit prices will govern.
- 3.3. Proposers are expected to examine special provisions, specifications, schedules, and instructions included in this Request. Failure to do so will be at the proposer's risk.

- 3.4. Failure to respond (submission of proposal, or notice in writing that you are unable to offer but wish to remain on the active mailing list) to Request for Proposals will be understood by the State to indicate a lack of interest and will result in the removal of the Firm's name from the applicable mailing list.

4. AWARD AND CONTRACT INFORMATION:

- 4.1. The State of Wyoming hereby notifies all proposers that it will affirmatively insure that minority business enterprises will be afforded full opportunity to submit proposals in response to this invitation and will not be discriminated against on the grounds of age, race, color, sex, creed, national origin, or disability.
- 4.2. The proposer also, agrees that should this firm be awarded a Contract that the firm will not discriminate against any person who performs work there under because of age, race, color, sex, creed, national origin, or disability.
- 4.3. The proposer expressly warrants to the State that it has the ability and expertise to perform its responsibilities hereunder and in doing so shall use the highest standards of professional workmanship.
- 4.4. The State of Wyoming reserves the right to reject any or all proposals, to waive any informality or technical defect in the proposals, or to award the contract in whole or in part, if deemed to be in the best interest of the State to do so. The Department of Administration and Information, Procurement Section, will award this contract to the firm, determined by the Department of Game and Fish, the most responsive and responsible offer based on criteria specified herein.
- 4.5. This Request for Proposal shall become part of the Contract and will be in effect for the duration of the Contract period.
- 4.6. The successful proposer will be required to enter into and sign a formal Contract with the State with reasonable adjustments acceptable to the State. The agreement will become a part of the Contract and will be in effect for the duration of the contract period. The contract language will control over any language contained within this RFP that conflicts with the signed and fully executed Contract.
- 4.7. Successful proposer shall comply with the Americans with Disabilities Act and Wyoming Fair Employment Practices Act. (W. S. 27-9-105 *et. seq.*).

DATED THIS 6th DAY OF February, 2013.

STATE OF WYOMING

Procurement Section

Assigned Buyer: Nick Koenigs

GENERAL PROVISIONS

1. INDEPENDENT CONTRACTOR

- 1.1. The contractor shall function as an independent contractor for the purposes of the Contract and shall not be considered an employee of the State of Wyoming for any purpose. The contractor shall assume sole responsibility for any debts or liabilities that may be incurred by the contractor in fulfilling the terms of the Contract and shall be solely responsible for the payment of all federal, state, and local taxes which may accrue because of this Contract. Nothing in the Contract shall be interpreted as authorizing the contractor or its agents and/or employees to act as an agent or representative for or on behalf of the State of Wyoming or the Agency, or to incur any obligation of any kind on the behalf of the State of Wyoming or the Agency. The contractor agrees that no health/hospitalization benefits, workers' compensation and/or similar benefits available to State of Wyoming employees will inure to the benefit of the contractor or the contractor's agents and/or employees as a result of this Contract.

2. INSURANCE:

- 2.1 All insurance policies required by this Contract, except workers' compensation and unemployment compensation policies, shall name the Agency and the State as an additional insured and shall contain a waiver of subrogation against the Agency and the State, its agents and employees. The contractor agrees it will carry the insurance which is applicable to this RFP. Contractor shall provide a copy of an endorsement providing this coverage.

3. LAWS TO BE OBSERVED:

- 3.1. The contractor shall keep fully informed of all federal and state laws, all local bylaws, regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority which in any manner affect those engaged or employed on the work or which in any way affect the conduct of the work. The contractor shall at all times observe and comply with all such laws, bylaws, ordinances, regulations, orders and decrees in force at the time of award. The contractor shall protect and indemnify the State and its representatives against any claim or liability arising from or based on the violation of any such law, bylaw, ordinance, regulation, order, or decree whether by himself or his/their employees. No extension of time or additional payment will be made for loss of time or disruption of work caused by any actions against the provider for any of the above reasons.

4. TAXES:

- 4.1. The contractor shall pay all taxes and other such amounts required by federal, state, and local law, including, but not limited to, federal and Social Security taxes, workers' compensation, unemployment insurance, and sales taxes.

5. ASSIGNMENT/CONTRACTOR:

- 5.1. The Contract shall not be assigned by the contractor. Third party participation is authorized only as a joint venture which must be clearly stated with details on the original proposal, signed by all parties participating. Any alterations, variations, modifications, or waivers of the provisions of this Contract shall be valid only if they have been reduced to writing, duly signed by the parties hereto, and attached to the original Contract agreement.
- 5.2. The contractor shall not enter into any subcontracts for any of the work contemplated under this Contract without prior written authorization of the State.
- 5.3. Claims for money due, or to become due to contractor from the State under the Contract may, be assigned to a bank, trust company, or other financial institution, or to a trustee in bankruptcy, without approval by the State. Notice of any assignment or transfer shall be furnished to the State.
- 5.4. The contractor shall not use the Contract, or any portion thereof, for collateral for any financial obligation without the prior written permission of the Agency.

6. TERMINATION OF CONTRACT:

- 6.1. Termination of the Contract may be made by any party at any time with or without cause, upon no less than thirty (30) days written notice to the other parties. The Contract shall remain in full force and effect until terminated as provided herein.
- 6.2. The State may, upon ten (10) days written notice to the contractor, terminate the Contract, in whole or in part, for just cause, which shall include failure of the Contractor to fulfill in a timely and proper manner the obligations under the Contract. In such event, all finished documents, data, models and reports prepared under this Contract shall, at the option of the State, become its property upon payment for services rendered through the termination of the Contract.
- 6.3. Should the contractor fail to comply with the provisions of the Contract, payment for portions of the Contract will be withheld until such time as the Contract terms have been implemented. Administrative, contractual, and/or legal remedies as determined by the Wyoming Attorney General will be implemented if it appears the contractor has breached or defaulted on the Contract.

7. ACCOUNT REPRESENTATIVE:

- 7.1. The successful proposer(s) shall appoint, by name, a company representative who shall be responsible for servicing this account. The appointed representative shall

be responsible to provide the services required to insure that the account will be administered in an organized systematic manner.

8. RESPONSIVENESS:

8.1. Proposers are expected to examine specifications, schedules, and instructions included in this package. Failure to do so will be at the proposer's risk.

9. EXTENSION AND AMENDMENT:

9.1. The proposer and the State covenant and agree that this proposal or subsequent Contract may, with the mutual approval of the proposer and the State, be extended under the same terms and conditions of this proposal or Contract for a period of one (1) year, and said option to extend this proposal or Contract for a one year period shall be in effect for each year thereafter for a total period not to exceed two (2) additional years.

10. COMPLIANCE WITH LAWS:

10.1. In performing the Contract, both parties agree to comply with all applicable state, federal and local laws, rules, and regulations.

11. AUDIT:

11.1. The State or any of their duly authorized representatives shall have access to any books, documents, papers, and records of contractor which are directly pertinent to the Contract for the purpose of making audit, examination, excerpts, and transactions.

12. CONFLICT OF INTEREST:

12.1. The parties warrant that no kickbacks, gratuities, or contingency fees have been paid in connection with the Contract and none has been promised contingent upon the award of the Contract. Proposer warrants that no one being paid pursuant to the Contract is engaged in any activities which would constitute a conflict of interest with respect to the purposes of the Contract.

13. NO FINDERS FEE:

13.1. No finder's fee, employment agency fee, or other such fee related to the procurement of this Contract shall be paid by either party.

14. OWNERSHIP OF DOCUMENTS/WORK PRODUCT:

14.1. It is agreed that all finished or unfinished documents, data, or reports, prepared by contractor under the Contract shall be considered the property of the State, and upon completion of the services to be performed, or upon termination of the

Contract for cause, or for the convenience of the State, will be turned over to the State.

15. CONFIDENTIALITY OF INFORMATION:

15.1. All documents, data compilations, reports, computer programs, photographs, and any other work provided to or produced by the contractor in the performance of the Contract shall be kept confidential by the contractor unless written permission is granted by the State for its release.

16. SOVEREIGN IMMUNITY:

16.1. The State of Wyoming and the Agency do not waive sovereign immunity by entering into the Contract, and specifically retain immunity and all defenses available to them as sovereigns pursuant to Wyoming Statute 1-39-104(a) and all other state law.

17. INDEMNIFICATION:

17.1 The Contractor shall indemnify, defend, and hold harmless the State, the Agency, and their officers, agents, employees, successors, and assignees from any and all claims, lawsuits, losses, and liability arising out of Contractor's failure to perform any of Contractor's duties and obligations hereunder or in connection with the negligent performance of Contractor's duties or obligations, including but not limited to any claims, lawsuits, losses, or liability arising out of Contractor's malpractice.

INTENTIONALLY LEFT BLANK

II. SPECIAL PROVISIONS

PROPOSALS MUST BE DELIVERED TO THE PROCUREMENT OFFICE IN A SEALED ENVELOPE OR PACKAGE BY 2:00 P.M. ON FEBRUARY 28, 2013.

PROPOSALS ARE TO BE DELIVERED TO THE PROCUREMENT OFFICE, 700 WEST 21ST STREET, CHEYENNE, WYOMING 82002, BY 2:00 P.M. ON FEBRUARY 28, 2013. NO PROPOSALS WILL BE ACCEPTED AFTER THE ABOVE DATE AND TIME.

1. STATE PARTIES:

This Request for Proposal (RFP) is issued by the Wyoming Department of Administration and Information, Procurement Section, on behalf of the Wyoming Game and Fish Commission (Agency).

Throughout this document and others in connection with this project, various references are made, or will be made to the "State". Generally, whenever this reference appears, the term "State" incorporates all parties to the RFP as cooperative state agencies that will be working on this project as a cohesive state unit.

It should be understood that the Director of the Game and Fish Department is empowered to be the signatory on all contracts, agreements, or modifications pertaining to this project. Such agreements, etc., not bearing this signature or that of a designee are invalid insofar as contractual relations between the State and Contractor are concerned.

The names and addresses of the State parties are:

Therese Hartman, Wildlife Mitigation Biologist
Wyoming Game and Fish Department
5400 Bishop Blvd.
Cheyenne, WY 82006

Nick Koenigs, Associate Buyer
Department of Administration and Information
Procurement Section
700 West 21st Street
Cheyenne, WY 82002

Questions Submission:

Questions regarding this RFP must be emailed in Word Format by **10:00 a.m.** Mountain Time on **February 15, 2013** to:

Department of Administration and Information
Procurement Section
Nick Koenigs, Purchasing Agent
Email: Nicholas.koenigs@wyo.gov

Please include the RFP number on all correspondence. All questions will be answered and e-mailed to all prospective proposers in the form of a written addendum.

2. PROPOSAL RESPONSE SEQUENTIAL ORDER:

Proposers are required to keep their proposal response in the same sequential order that is referenced in the Proposal Submission Requirements.

3. EFFECTIVE DATES OF PROPOSAL:

All terms, conditions and costs quoted in the Proposer's response will be binding on the vendor for 365 days from the effective date of the proposal.

4. RESTRICTIONS ON COMMUNICATION WITH STATE STAFF:

The Department of Administration and Information, Procurement Section, is the primary point of contact from the date of release of the RFP until the Contract is fully executed and signed. Any attempt to contact any State employees, other than those named in the "Questions Submission" section above, regarding this procurement may cause rejection of any proposal submitted by that party.

In order to provide equal treatment to all proposers, questions must be submitted in writing, and answers will be distributed to all vendors requesting this RFP.

5. ADVERTISING AWARD:

The successful proposer must receive written approval from the State before advertising the award of the contract or the services being provided after the contract begins. The proposer must agree not to refer to awards in commercial advertising in such a manner as to state or imply that the firm or its services are endorsed or preferred by the State of Wyoming.

6. CONTRACT NEGOTIATION:

The State will notify the successful proposer and negotiate a contract under the procedures of the State of Wyoming, Game & Fish Department, General Accounting Section and the Wyoming Attorney General's contract guidelines. A draft Contract is included in the RFP as Attachment A.

7. BEGINNING WORK:

The successful proposer must not commence any work that could be billed until a valid contract has been executed. The State will not pay for any work by the proposer prior to execution of the contract.

III. SCHEDULE OF EVENTS

The following schedule of events is subject to change at the sole discretion of the Agency:

Event	Deadline
1. RFP mailed to prospective proposers	February 6, 2013
2. Deadline to submit written questions	February 15, 2013
3. Answers to questions mailed out	February 19, 2013
4. Proposal submission deadline	February 28, 2013
5. Interviews (to be held at the discretion of the Agency)	Week of March 4, 2013
6. Proposal selection made	March 8, 2013
7. Contract finalized	March 15, 2013
8. Deadline for receipt of the Final Report	September 1, 2013

IV. ADMINISTRATIVE INFORMATION

1. BACKGROUND AND OBJECTIVES:

The purpose of this RFP is to secure a qualified Contractor to facilitate 2013 noise monitoring at greater sage-grouse leks and within the Pinedale Anticline Project Area (PAPA) in Pinedale, Wyoming, according to the Record of Decision for the, Final Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project (PAPA ROD).

Specific level of change to be monitored:

The data collected for this project will be sufficient to identify the changes specified in Appendix B of the PAPA ROD. Required monitoring includes measuring noise levels at development area leks. Changes that will be monitored:

Noise levels demonstrated to impact peak lek use by male sage-grouse and a concurrent change in the total average 2-year numbers of males attending development area lek complexes (the Mesa, Duke's Triangle, or Yellow Point lek complex), compared to the East Fork, Speedway, or Ryegrass reference lek complexes.

Objective:

- Monitor noise levels at treatment area leks (using protocols developed for the Pinedale Anticline Project Office, Attachment B) in compliance with the PAPA ROD.
- Obtain ambient noise level measurements from reference areas to establish locally appropriate, baseline ambient values.

Monitoring will occur on 19 leks (Appendix A), the Mesa, Duke's Triangle and Yellow Point lek complexes (development area) and ambient noise levels will be collected following Pinedale Anticline Project Office (PAPO) protocols at the East Fork, Speedway, and Ryegrass lek complexes (reference area) (Project Area Map, Appendix B).

VI. PROJECT SPECIFICATIONS AND REQUIREMENTS

1. RESPONSIBILITIES OF PROPOSER [CONTRACTOR]:

1.1 OBJECTIVES: Monitor noise levels at leks in the PAPA. Noise monitoring will be conducted following protocols prepared for the PAPA (Attachment B).

- Contractor shall provide copies of the original datasheets and an excel spreadsheet with all data summarized for each survey location. (Spreadsheet provided by PAPO)
- Raw data will be provided to the WGFD and PAPO.
- Data collected will be the property of the WGFD and/or PAPO.

1.2 REQUIREMENTS

1.2.1 Noise Monitoring and Data Collection:

- Noise monitor equipment will NOT be provided by the PAPO.
- Contractor will utilize high quality noise monitors calibrated Type I (noise floor <25 dB) sound level meter (SLM) with a microphone windscreen and environmental housing (where applicable).
- Measurements will be collected during times when noise exposure is most likely to affect greater sage-grouse – nights and mornings (i.e. 6 pm – 9 am) and should be taken for > 1 hour at each lek over 2+ days with suitable climactic conditions.
- Preferably monitoring will occur during the peak strutting period (beginning 4/1* through 5/1).
- Monitoring should occur at multiple (3-4) locations between each noise source on the outer edge of lek perimeter between lek and nearest noise activity.
- **Remote monitoring equipment is preferred where measurements are taken at active leks.** If remote monitoring equipment is not used, monitoring should not occur during time periods when birds are lekking. To not disturbed birds, monitoring activity should not occur between 5 am -9am.
- WGFD will provide current lek locations to be monitored. There are 19 development area lek locations to be monitored in 2013 and a minimum of 3 ambient noise locations within reference areas (TBD).
- Critical metrics will include: L_{50} , L_{90} , L_{10} , L_{eq} , and L_{max}
- All measurements will be collected I A-weighted (dBA decibels).
- Additionally, measurements in Unweighted (dBF) and C-weighted (dBC) decibels are also recommended.
- SLM should log 1/3-octave band levels throughout the measurement period.
- Ambient levels will be collected using A-weighted L_{90} metric and a measure of median noise exposure using A-weighted L_{50} metric.

*First monitoring event should occur during first week of April

1.2.2 Data Submission, and Reporting:

- All data will be submitted to the PAPO.
- Data will be submitted electronic and hardcopy using attribute tables provided by the PAPO.
- Accurate location data will be collected for each measurement location

- Data will include the location and type of all nearby sources of anthropogenic noise.
- All horizontal position data will be collected and reported in NAD 83, Zone 12, Universal Transverse Mercator (UTM).
- A draft compilation report will be submitted August 1, 2013.
- Final Report is due September 1, 2013.

1.3 COMMUNICATION AND ON-SITE REQUIREMENTS

The Contractor and Agency Representative may schedule meetings as deemed necessary to review current project status. Phone call and e-mail are the preferred means of communications.

1.4 DOCUMENTATION

The Contractor shall maintain all fiscal records relating to the contract in accordance with generally accepted accounting principles and shall maintain any other records relating to the contract. The State, the Federal government and their duly authorized representatives shall have access to such fiscal records and to all other books, documents, papers, plans and writings of the Contractor which relate to the contract to perform examination and audits and make excerpts and transcripts. The Contractor shall retain and keep accessible all such fiscal records, books, and documents for three (3) years, or such longer period as may be required by applicable law, following final payment and termination of the contract, or until the conclusion of any audit, controversy or litigation arising out of or related to the contract, whichever date is later.

VII. PROJECT MANAGEMENT

1. STATE'S PROJECT REPRESENTATIVE:

All project management and coordination for the State will be through a single point of contact designated as the Agency Representative. **The Agency Representative is Therese Hartman**. Contact information for the Agency Representative is listed in Section III, 1 – Special Provisions.

2. PROPOSER'S PROJECT MANAGER:

The proposer will designate a single point of contact for the coordination of all aspects of their work. The proposer's Contract Project Manager's name and resume will be submitted with the proposal. The successful proposer shall not change the Contract Project Manager without written State approval.

VIII. ACCEPTANCE

Invoices will be submitted to the PAPO and accompanied with a brief status report supporting billing. Final payment will be processed upon approval of final report and receipt of all required documentation.

IX. EVALUATION OF REFERENCES

References are requested from at least three (3) prior clients. Each reference should describe relevant experience that will be beneficial in completing this project. An alternative point of contact for each reference should be listed when possible.

References will be verified and evaluated during the proposal evaluation process (Section XI – Evaluation Process) by telephone calls made by an Agency Evaluation Team. The reference will be ignored if the Evaluation Team cannot contact the referenced contact person after reasonable attempts during the designated evaluation period. All attempts to contact a referenced client will be documented, including the date and time of the attempt.

No discussions will take place between a proposer and an Evaluation Team member relative to reference verification and evaluation from the time of the proposal opening to posting of recommended proposal award. Any attempt by a proposer to initiate such a discussion will be grounds for proposal rejection.

The State reserves the right to investigate the references and the past performance of any proposer with respect to its successful performance of similar projects, compliance with specifications and contractual obligations, its completion or delivery of a project on schedule, and its lawful payment of suppliers, subcontractors and workers. The State may postpone the award or execution of the contract after the announcement of the apparent successful proposer in order to complete its investigation. The State reserves its right to reject any proposal response or to reject all proposal responses at any time prior to the State's execution of a contract.

X. PROPOSAL SUBMISSION REQUIREMENTS

Proposals will be submitted in two major sections – the Technical Proposal and the Cost Proposal. Omission of these sections or any item within these sections shall result in the proposal being eliminated from consideration.

1. TECHNICAL PROPOSAL FORMAT:

The **Technical Proposal** must include the following sections. In addition, all sections must appear in the following order:

1.1 EXECUTIVE SUMMARY:

The Executive Summary will condense and highlight the contents of the technical proposal in order to provide a broad understanding of the proposer's qualifications and approach to meeting the project tasks and requirements of the RFP.

1.2 PROPOSER BACKGROUND, EXPERIENCE AND REFERENCES:

This section will include details regarding the proposing firm(s), the type of work the firm(s) specialize in, and experience relevant to the proposed contract. A demonstrated record of satisfactory completion of similar projects is favored.

Experience will be judged based on details pertaining to past projects completed by the proposer. For each referenced project, the proposer must provide the client name, address and telephone number for the client or representative that was directly involved in the project, a description of the work performed, whether as a principal contractor or a sub-contractor; the time period of the project; and the scheduled and actual completion dates for each project task. In addition, the proposing firm(s) will identify by name, title, specialties,

and level of involvement any individual(s) that were assigned to the referenced project, which are proposed for this project, under Section X, 1.3 – Resources and Project Organization.

1.3 PROPOSER’S RESOURCES AND ORGANIZATION:

The proposer will detail key personnel and other resources assigned to each project task and deliverable.

Resumes will be included for the project manager assigned professional responsibilities for a project task or deliverable. Technicians or resources that provide assistance only need no documentation.

Proposer intending to subcontract any or all of the work outlined in the attached specifications must state that intention in their proposal and make known the name and business address of the proposed subcontractor and explain the role and responsibility of the referenced individual during the project.

1.4 PROPOSER’S PROJECT WORK PLAN:

The proposer will submit a work plan that addresses all the elements of the Objective and Requirements section and indicates a thorough understanding of the scope of work outlined in Section VI 1.2.

The proposal will contain a comprehensive and practical description of the proposer’s plans for this project.

2. COST PROPOSAL FORMAT:

The **Cost Proposal** must include the following information.

2.1 PRICING SCHEDULE A

Schedule A must include the proposing firm(s) total fixed price costs for the entire project.

XI. EVALUATION PROCESS

1. EVALUATION METHOD AND CRITERIA:

An evaluation team of WGFD personnel will evaluate proposals. Proposals will first be reviewed with regard to conformance to all requirements. Proposals that do not conform to all requirements will not be scored. The evaluation team will recommend the proposer to be considered for the contract award.

1.1 Proposer Qualifications/References – The proposal and three references are required demonstrating relevant experience. The proposal demonstrates adequate resources are committed or available to the project and the individual(s) assigned exhibit knowledge, skills and abilities that reflect capability to fulfill the requirements of this project. Professional staff proposed for the project should have previous experience with projects of comparable scope.

1.2 Proposer’s Description of Methodology - The proposer has submitted a response that

meets the criteria of the RFP and indicates a thorough understanding of the scope of the work. The proposal has identified realistic time lines for project implementation specified in the RFP. The proposal contains a comprehensive and practical description of the proposer’s plan for project management.

- 1.3 **Cost Analysis** – The proposer’s total project cost will be evaluated. Cost analysis must include appropriate cost justification. The budget has enough detail to show that costs are appropriate. All major budget items are identified individually.

2. EVALUATION CONSIDERATIONS:

The evaluation will occur in accordance with the criteria listed in Section XI, 3 – Evaluation Procedure. Proposers should concentrate on responding with examples that demonstrate successfully completed projects with similar scope. Price will be considered in the evaluation, but will not be the only focus of the evaluation. Evidence of successful completion of similar projects will be an important consideration in the evaluation process. The evaluation will produce a ranked list of proposers.

A short list of finalists may be called for interviews to complete the evaluation. The interview panel will consist of members of the evaluation team. If determined necessary, interviews will be held during the week of March 4, 2013. Finalists will be contacted the week prior if interviews are conducted.

3. EVALUATION PROCEDURE:

The evaluation will utilize a point system to create a list of proposals in ranked order. Criteria relating to whether the proposal falls below, meets, or exceed expectations will be used. The proposed costs as submitted by the proposer and criteria relating to the extent each cost is above or below the average (or median if more appropriate) cost of all proposals will be used for scoring costs. The proposer must provide costs associated with the scope of work described under Section VI – Project Specifications and Requirements. Available points for each of the evaluation criteria are listed below:

Evaluation Criteria	Available
Points	
I. <u>Proposer Qualifications/References</u>	35%
	35
II. <u>Description of Methodology</u>	35%
	35
III. <u>Cost Analysis</u>	30%
	<u>30</u>
<u>Total Project Qualifications</u>	<u>100</u>

The State of Wyoming will be the sole judge with respect to the evaluation of proposals. The proposer that best meets the conditions of each of the individual criterion will be awarded the highest (not necessarily maximum) points for that specific criterion. The total possible number of points will not exceed 100. After the WGFD Evaluation Team completes evaluations, the proposer with the highest total number of points will be awarded the contract.

SSN/Employer Identification
Number _____

3. OWNERSHIP AND CONTROL:

Proposer's Legal Structure:

_____ Sole Proprietorship	_____ General Partnership
_____ Corporation	_____ Limited Partnership
_____ Limited Liability	_____ Other _____

If Proposer is a sole proprietorship, list:

Owner Name _____ Phone () _____

Mailing Address _____

City _____ State _____

Zip _____

Employer Identification
Number _____

Beginning date as owner of sole
proprietorship _____

Provide the names of all individuals authorized to sign for the Proposer:

NAME (printed or typed)	TITLE

VERIFICATION

I certify under penalty of perjury, that I am a responsible official (as identified above) for the business entity described above as Proposer, that I have personally examined and am familiar with the information submitted in this disclosure and all attachments, and that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including criminal sanctions which can lead to imposition of a fine and/or imprisonment.

(Signature)

(Name and Title) (Typed or Printed)

(Date)

ATTACHMENT A

Sample

GF-FISCAL-19
REV. 7/07

Contract between

and the
Wyoming Game and Fish Commission

1. **Parties.** The parties to this Contract are _____ (Contractor), whose address is _____, and the Wyoming Game and Fish Commission (Commission) whose address is 5400 Bishop Blvd., Cheyenne, WY 82006.
2. **Purpose of Contract.** (Identify results to be obtained from the contractor or what you expect to receive from the completion of the contract.)
3. **Effective Date.** The effective period of this contract shall begin on _____ or upon the date the last required signature is affixed hereto, whichever is later and shall end on _____. The Commission shall not be held liable for, nor obligated to pay for any goods delivered or services performed prior to or after the effective period of this contract. All services shall be completed during this term.
4. **Payment.** The agency agrees to pay the Contractor for the services described herein. The total payment under this Contract shall not exceed _____ (_____). In accordance with W.S. 16-6-602, payment shall be due and payable to the contractor no later than forty-five (45) days after the Commission's receipt and acceptance of goods and/or services provided for in this contract, and of the respective proper itemized invoice as prescribed in W.S. 9-4-103. No payment shall be made for work performed before the date upon which the last required signature is affixed to this contract.
5. **Responsibilities of Contractor.** The Contractor shall provide the following services, which include but shall not be limited to those services set forth in the attachments: (Describe in detail and in complete sentences, with sufficient standards that can be enforced.)
6. **Amendments.** Any changes, modifications, revisions or amendments to this Contract which are mutually agreed upon by the parties to this Contract shall be incorporated by written instrument, executed and signed by all parties to this Contract.
7. **Americans with Disabilities Act.** The undersigned is subject to Title VI and Title VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and offers all persons the opportunity to participate in programs or activities regardless of race, color, national origin, age, sex or disability. Further, it is agreed that no individual will be turned away from or otherwise denied access to or benefit from any program or activity that is directly associated with a program of the Wyoming Game and Fish Commission on the basis of race, color, national origin, age, sex or disability. The undersigned also understands that sexual harassment in any form will not be tolerated and that he or she and anyone in their employ shall comply with all provisions of the State of Wyoming Sexual Harassment Policy. The undersigned also acknowledges that he/she has been afforded the opportunity to review the State of Wyoming Sexual Harassment Policy.
8. **Applicable Law/Venue.** The construction, interpretation and enforcement of this Contract shall be governed by the laws of the State of Wyoming. The Courts of the State of Wyoming shall have jurisdiction over this Contract and the parties, and the venue shall be the First Judicial District, Laramie County, Wyoming.
9. **Assignment/Contract Not Used as Collateral.** This agreement, or any provision herein may not be assigned for collateral or as a security interest to any third party. The Contractor shall not use this contract, or any portion thereof, for collateral for any financial obligation, without the prior written permission of the Commission. Contractor shall have no right to let or sublet any part of or all of the rights or privileges herein granted, except upon written authorization by the Agency. It is further understood and agreed to by all parties that all terms and covenants hereof shall be binding and to the benefit of the Parties, their heirs, personal representatives, successors and assigns during the term covered by this contract.
10. **Third Party Beneficiary Rights.** The parties do not intend to create in any other individual or entity the status of the third party beneficiary, and this Contract shall not be construed so as to create such status. The rights, duties and obligations contained in this Contract shall operate only between the parties to this Contract, and shall inure solely to the benefit of the parties to this Contract. The provisions of this Contract are intended only to assist the parties in determining and performing their obligations under this Contract
11. **Availability of Funds.** Nothing in this agreement shall be construed as obligating the expenditures of the Commission's funding beyond the specified provisions of this agreement, appropriations authorized by law, or as obligating the Commission should funding be unavailable for payment of any obligation herein. No penalty shall accrue to the Agency in the event this provision is exercised, and the Agency shall not

Initials: WGFD _____ Contractor _____

be obligated or liable for any future payments due or for any damages as a result of termination under this section. This provision shall not be construed to permit the Agency to terminate this contract to acquire similar services from another party.

12. **Compliance with Laws.** The Contractor shall keep informed of and comply with all applicable federal, state and local laws and regulations in the performance of this Contract.

13. **Entirety of Contract.** This Contract, consisting of ____ (____) pages, represents the entire and integrated Contract between the parties and supersedes all prior negotiations, representations, and agreements, whether written or oral. This Contract includes the following attachments as if set forth fully herein: Exhibit A ____ consisting of ____ pages; Exhibit B ____ consisting of ____ pages.

14. **Extensions.** The acceptance of this contract by Contractor does not grant or convey a right of renewal in future years.

15. **Force Majeure.** Neither party shall be liable for failure to perform under this Contract if such failure to perform arises out of causes beyond the control and without the fault or negligence of the nonperforming party. Such causes may include, but are not limited to, acts of God or the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes, homeland security issues and unusually severe weather. This provision shall become effective only if the party failing to perform immediately notifies the other party of the extent and nature of the problem, limits delay in performance to that required by the event, and takes all reasonable steps to minimize delays. This provision shall not be effective unless the failure to perform is beyond the control and without the fault or negligence of the nonperforming party.

16. **Independent Contractor.** The Contractor agrees that it will not hold itself as an agent, servant or employee of the Wyoming Game and Fish Commission nor will Contractor obligate the Wyoming Game and Fish Commission in any manner. The Contractor shall function as an independent contractor for the purposes of this contract and is solely responsible for all taxes, liabilities and debts arising under this contract.

17. **Kickbacks.** Acceptance of this contract constitutes certification that the Contractor is not presently debarred, suspended, proposed for disbarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency. Acceptance of this contract constitutes certification that the Contractor is not delinquent on any Federal debt. Acceptance of this contract further constitutes certification that to the best of the Contractor's knowledge and belief:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Contractor to any person for influencing or attempting to influence an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

(b) If funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the Contractor will complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

18. **Human Trafficking.** As required by 22 U.S.C. 7104(g) and 2 C.F.R. Part 175, this agreement may be terminated without penalty if a private entity that receives funds under this agreement:

- (a) Engages in severe forms of trafficking in persons during the period of time that the award is in effect;
- (b) Procures a commercial sex act during the period of time that the award is in effect; or
- (c) Uses forced labor in the performance of the award or subawards under the award.

19. **Notices.** All notices arising out of, or from, the provisions of this Contract shall be in writing and given to the parties at the address provided under this Contract, either by regular mail, facsimile, e-mail, or delivery in person.

20. **Approval by Procurement Services.** This agreement is not binding on either party until approved by the Division of Procurement Services, Department of Administration & Information and the Governor of the State of Wyoming, if required by W.S. 9-2-1016(b).

21. **Severability.** Should any portion of this contract, any attachment or exhibit be judicially determined to be illegal or unenforceable, the remainder of the Contract shall continue in full force and effect, and either party may renegotiate the terms affected by the severance.

22. **Sovereign Immunity.** The State of Wyoming and the Agency do not waive sovereign immunity by entering into this Contract and specifically retain immunity and all defenses available to them as sovereigns pursuant to W.S. 1-39-104.

23. **Advertising Award.** The Contractor must receive written approval from the State before advertising the award of the contract or the services provided after the contract begins. The Contractor must agree not to refer to awards in commercial advertising in such a manner as to state or imply that the firm or its services are endorsed or preferred by the State of Wyoming.

Initials: WGFD _____ Contractor _____

24. **Termination of Contract.** Termination of the agreement may be made by any party, at any time, with or without cause, upon no less than thirty (30) days written notice by certified mail, telegram, or personal delivery of notice to the other parties. This contract shall remain in full force and effect until terminated as provided herein.

25. **Titles Not Controlling.** Titles of paragraphs are for reference only, and shall not be used to construe the language in this Contract.

26. **Waiver.** The waiver of any breach of any term or condition in this Contract shall not be deemed a waiver of any prior or subsequent breach.

27. **Signatures.** This contract consists of _____ pages, which include the attached exhibits. All parties have read the agreement, which includes all exhibits, and agree to comply with all provisions. Each party agrees to initial in the lower left hand corner of each page which initialing indicates that the party has read the page, understands the language therein and agrees to abide by each and every provision.

28. **Indemnification.** The Contractor shall indemnify, defend and hold harmless the State, the Agency, and their officers, agents, employees, successors and assignees from any and all claims, lawsuits, losses, and liability arising out of Contractor's failure to perform any of Contractor's duties and obligations hereunder or in connection with the negligent performance of Contractor's duties or obligations, including but not limited to any claims, lawsuits, losses or liability arising out of Contractor's malpractice.

WYOMING GAME AND FISH COMMISSION

CONTRACTOR

_____/_____
Director Date

_____/_____
Contractor Signature Date

_____/_____
Chief Fiscal Officer Date

Contractor Name (Print)

Approval as to Form:

Street Address/PO Box

_____/_____
Attorney General Rep Date

City ST Zip

Social Security/Tax ID No.

Corporation

Partnership

Limited Liability Co.

Initials:
WGFD _____
Contractor _____

Noise monitoring recommendations for greater sage-grouse habitat in Wyoming

Prepared for:
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Summary of noise-monitoring recommendations

- Noise measurements can be used to establish baseline ambient values, determine compliance with noise regulations, profile noise sources, and ground-truth noise prediction models.
- Due to the difficulty of measuring ambient noise levels in quiet conditions, we recommend the use of both empirical sampling and ambient noise modeling to establish baseline ambient values.
- Measurements should be made by qualified personnel experienced in acoustical monitoring.
- Measurements should be made with a high quality, calibrated Type I (noise floor < 25 dB) sound level meter (SLM) with a microphone windscreen and (where applicable) environmental housing.
- Measurements should be collected during times when noise exposure is most likely to affect greater sage-grouse— nights and mornings (i.e. 6 pm – 9 am) and should be taken for ≥ 1 hour at each site, ideally over multiple days with suitable climactic conditions. To capture typical variability in noise level at the site of interest, deployment of SLM units for multiple days is preferred.
- Environmental conditions should be measured throughout noise measurement periods so that measurements made during unsuitable conditions can be excluded.
- Measurements should be made at multiple (3-4) locations between each noise source and the edge of the protected area. On-lek measurements should exclude time periods when birds are lekking.
- Accurate location data should be collected for each measurement location. Surveyors also should catalog the type and location of all nearby sources of anthropogenic noise.
- Critical metrics should be collected: L_{50} , L_{90} , L_{10} , L_{eq} , and L_{max} . All measurements should be collected in A-weighted decibels (dBA) and, if possible, also collected in unweighted (dBF) and C-weighted (dBC) decibels. If possible, SLM should log 1/3-octave band levels throughout the measurement period. Additional metrics may be collected, depending on the goals of the study.
- To determine baseline ambient levels, we recommend the use of A-weighted L_{90} metric. As a measure of median noise exposure, we recommend the use of A-weighted L_{50} metric.

The purpose of noise measurements

Noise is associated with most phases of human development activity, from early construction to the daily operation of a completed project. Studies have demonstrated that anthropogenic noise can have a range of impacts on wildlife, including temporary or permanent hearing damage, increased stress levels, disruption of natural behaviors, changes in breeding success and avoidance otherwise suitable habitat (Barber et al. 2010; Kight & Swaddle 2011). Even though the rapid spread of human development and the associated anthropogenic noise has impacts on wildlife, it is not always logistically, politically, or economically feasible to eliminate or even minimize noise (Blickley & Patricelli 2010). The more common policy approach is to establish noise standards that set an upper limit on the level of noise that can be produced in the habitat of species of concern. Policy makers may also mandate or recommend particular noise mitigation measures to comply with these standards or require prediction of the potential impacts from noise in the planning phase. Effective implementation and enforcement of compliance with noise management strategies requires information about pre-development ambient levels and the actual or predicted changes in noise levels that result from anthropogenic development. This information is often obtained through empirical measurements made in the geographic area of interest. Such noise measurements may inform noise management strategies in the following ways:

- *Establish baseline ambient values.* Measurement of ambient noise levels may be necessary to establish baseline values in an area prior to development or for comparison to noise levels in nearby developed areas. Such ambient values may be established on a site-specific or region-wide basis, depending on the availability of funding and manpower, existing data availability, and habitat homogeneity across the landscape. Current noise regulations for sage-grouse habitat, for example, use an ambient-based noise standard, which allows measured amplitudes to increase a pre-determined amount relative to the undisturbed ambient level (e.g. [Wyoming Executive Order 2011-5](#)). Such standards require knowledge about the ambient conditions in an area prior to development or in similar but undisturbed areas. Due to the difficulty of obtaining accurate measurements of quiet ambient levels, we recommend that baseline ambient values be established using a combination of empirical sampling of ambient noise (using the methods described here) and ambient noise modeling (see section below “*A statement about the difficulty of measuring ambient noise and quiet sounds*”).
- *Measure compliance with noise regulations.* Noise measurements may be used to measure noise production by noise sources or noise exposure at critical sites to gauge compliance with noise-exposure management strategies and evaluate the effectiveness of noise abatement measures.
- *Profile noise produced by different noise source types.* Noise measurements can be used to determine the noise output of individual pieces of equipment or noise sources to develop noise profiles of these sources for inclusion in a database of noise sources. These data can be used in predictive models to estimate the likely impact of new development on the noise levels in areas of pre-existing or no development.

- *Calibrate and ground-truth noise prediction models.* Noise prediction models, such as Soundplan or NMSimNord can be used to estimate the likely impact of development on ambient noise levels in an area. Output from such models is best when validated using on-the-ground measurements.

The following recommendations are intended to serve as a general protocol for collection of noise measurements in areas of existing and proposed development. This protocol includes equipment recommendations, recommendations for timing and duration of measurements, as well as a recommendation of which metrics should be incorporated. Our goal is to develop a protocol that is efficient, effective and produces consistent results. The protocol was written to facilitate the gathering of noise measurements relevant to stipulations for greater sage-grouse protection; however, noise impacts are not restricted to sage-grouse and we attempted to make this protocol useful for noise monitoring more generally. Use of a standard protocol for noise monitoring will ensure that future measurements are comparable across locations, times, and surveyors. The following recommendations are based upon our experience, discussions with other experts, and existing noise monitoring protocols developed for other noise types and species. This protocol should be considered a work in progress and should be updated, as data needs and availability change.

A statement about the difficulty of measuring ambient noise and quiet sounds

As likely will become clear when reading this document, the measurement of noise requires expensive, complicated equipment and the interpretation of resulting data requires specialized knowledge and experience. The measurement of quiet noise levels (approximately 40 dB or less)—such as ambient values, quiet sources or even loud sources at a large distance—is especially difficult, since this requires extremely-sensitive, finely-calibrated equipment and excellent environmental conditions. Any flaws in the equipment, conditions and measurement protocol will likely lead to over-estimation of noise levels. For example, many noise meters (Type 2 meters) are unable to measure sounds quieter than 35 dBA, so measurements of any sources near or below this limit are meaningless and potentially misleading. Similarly, collecting measurements on a windy day or while moving the meter (or moving near the meter) can lead to over-estimates of ambient values. Even professional measurements on Type-1 sound level meters will typically overestimate ambient levels in quiet areas (<27 dBA). This is because A-weighting (defined below) boosts the amplitudes of the mid-frequencies, which in very quiet areas includes noise from the pre-amplifier on the sound-level meter. This is not a problem when measuring louder sounds (i.e. many noise sources associated with energy development) which overwhelm any contribution of the noise from the SLM (as well as noise from a slight breeze or other incidental sounds). Since many noise stipulations are relative to ambient values, over-estimation of ambient measures can have enormous repercussions, increasing allowable noise levels at that site.

Given the ease with which poor measurements can be made, and the large consequences of these measurements, noise measurements should be collected by experienced personnel. It is simply not true that any person (or consulting firm) can rent a noise meter and make adequate measurements of noise—especially of ambient and relatively quiet sources. Therefore, we want to emphasize that this protocol is not meant to replace specialized training on noise measurement. The intent is to provide guidelines to experienced personnel so that measurements

are made in a more consistent and accurate manner and to highlight areas where specialized training and care is required. To be blunt, we encourage agencies interested in gathering noise measurements to ensure that consultants offering to make them have the relevant expertise as, in this case, bad data are worse than no data at all. Overestimation of baseline ambient values can have serious repercussions for sage-grouse and other noise-sensitive species.

Due to the difficulty of measuring quiet ambient levels—as well as experimental evidence indicating that ambient values used in noise management strategies should represent the pre-development ambient levels, such that new developments do not further impact already impacted soundscapes (Blickley et al. 2012; Patricelli et al. 2012)—we recommend that baseline ambient values ultimately be established using a hybrid approach, combining empirical sampling of noise levels with modeling to create a map of pre-development ambient noise. This would lead to broader coverage, since collecting empirical measurements at each key site would be time consuming and interpolating levels between these sites would be inaccurate without a model. For example, the National Parks Service (NPS) Natural Sounds and Night Skies Division is currently developing a model to predict ambient noise levels with and without existing developments at the landscape level. The model uses a machine-learning algorithm to improve predictions using publically-available input variables related to location, climate, land cover, hydrology, and degree of human development. The algorithm improves its accuracy (i.e. learns to improve its estimates) with each new empirical measurement. Therefore, collection of ambient noise levels in areas with little disturbance, using the protocol described here, will help to improve the accuracy of the model. Data from such an approach would be useful for multiple public and private agencies interested in tracking noise exposure over larger areas for a variety of species.

The process described above, however, will take time. In the interim, we have recommended to the BLM and Wyoming Game and Fish Department that noise management strategies for sage-grouse habitat should *not* set baseline for each lek by measuring ambient noise at lek edge. Rather, measurements of pre-development ambient values should be used in lieu of measurements made at lek edge. Based on our survey of the literature and data from recent noise-monitoring efforts, we recommend using an ambient value of 20-22 dBA as a baseline in noise management strategies for sage-grouse habitat. For a justification of these values and a broader discussion of noise stipulations related to sage-grouse, please see Patricelli et al., 2012.

A statement about the difficulty of measuring traffic noise

There is evidence that noise from traffic is has a significant impact on sage-grouse (Blickley et al. 2012; Patricelli et al. 2012). However, measuring traffic noise can be quite challenging, since intermittent traffic, such as the traffic in most sage-grouse habitat, causes short periods of loud noise interspersed with longer periods of quiet. With a variable noise source such as this, is it difficult to choose which metric to use to characterize noise. This is especially true since we do not know whether it is the total noise exposure through the day (or in a critical time period, such as nights and/or mornings) or the maximum noise level as a vehicle passes that best predicts impacts on grouse. A measure of “average” amplitude (e.g. L_{eq}) would be problematic, since the occasional noise events would be averaged with much longer quiet periods, having little effect on measured values. A great deal of traffic would be needed to raise average noise levels (L_{eq}) by 10 dBA. In general, a ten-fold increase in traffic is associated with a 10 dB increase in average noise levels, so an increase from 2 to 200 vehicles or from 200 to 2,000 vehicles over a given

time interval. A ten-fold increase in traffic would likely have a major impact on sage-grouse, yet may not exceed current noise management objectives inside and outside of core areas in Wyoming. Similarly, the sounds of vehicles passing would have little to no influence on median noise level (L_{50}), unless traffic noise is detectable 50% of the time or more. Even measures of maximum noise levels (such as the L_{max}) can be problematic, since other sound sources besides vehicles can affect these measures. This is especially problematic during long-term deployment of meters for monitoring, since a single meadowlark perched near (or on) the meter could lead to extremely high L_{max} measurements. Excluding these events would require that they be identified in synchronized audio recordings; alternatively, the 1/3-octave band frequency profile of the noise (at 1-second intervals) may be useful for these exclusions (these methods are discussed below).

These difficulties in choosing the appropriate measure to characterize noise suggest that approaches for the management of more continuous noise sources (e.g. compressors stations, drilling rigs and other infrastructure) may not be suitable for the management of traffic noise. Patricelli et al. (2012) discuss this issue in more detail and provide recommendations for management strategies focused on traffic noise. The recommendations for long-term monitoring of noise made into his protocol should provide useful measurements of traffic noise. It may also be useful to complement these measurements with data from axle counters.

Recommendations

Noise measurement surveyors:

As discussed above, all noise monitoring should be carried out by qualified personnel in order to ensure the accuracy of measurements. Qualified personnel should have:

- A familiarity with and experience in applying relevant acoustical standards, (e.g. ISO and ANSI).
- A familiarity with acoustical monitoring equipment and protocols.
- Practical knowledge of spectrum analysis (octave band and 1/3 octave band) and a range of noise metrics (L_{10} , L_{50} , L_{90} , L_{max} , L_{eq} , etc.)
- An ability to perform necessary acoustic calculations as well as analyze, interpret, and explain results.

These qualifications can most easily be met by having noise monitoring carried out by experienced acoustic consultants or researchers.

Equipment recommendations:

- *Sound level meter:* A sound level meter (SLM) is used to measure the amplitude of a noise source in decibels (dB). Measurements should be made with a self-contained, professional-quality meter to ensure accurate measurements. Due to the low level of ambient noise levels, accurate measurements will require use of Type 1 meters (as defined by standards ANSI S1.4-1983), which have higher quality microphones than Type 2 meters. Professional-quality sound level meters allow users a wide range of measurement options and are capable of logging data over multiple days at a variety of time intervals. Professional-quality meters, such as those made by Larson Davis, Brüel & Kjær and Quest, among others, also have the capability to identify individual noise events and are typically capable of processing data onboard to calculate a variety of metrics (see *Metrics* below). Octave and 1/3-octave band analyzers should meet specifications set by ANSI (ANSI S1.11-2004). Such meters are typically expensive to purchase, but may be available for rental for short time periods. Meters should be regularly recalibrated professionally as recommended by the manufacturer and calibrated before each use with a field calibrator (meeting standard ANSI S1.40-2006). Since all meters differ, it is not possible to include detailed instructions on the use of meters here. Rather, the surveyor should consult the (often voluminous) instructions for their SLM to ensure that the desired metrics are being collected and that calibration has been performed correctly.

As discussed above, most Type-1 precision sound level meters (SLM) have a “noise floor” of ~17 dB, meaning that they cannot measure sounds quieter than this level, since these sounds will be masked by the noise from the SLM itself. Some SLM noise is typically detected up to 10 dB above the noise floor (i.e. 27 dB), especially when using A-weighting, since A-weighting boosts the amplitudes of the mid-frequencies, which in very quiet areas includes noise from the pre-amplifier on the sound-level meter. This is not a problem when measuring louder sounds (i.e. many noise sources associated with

energy development) which overwhelm any contribution of the noise from the SLM (as well as noise from a slight breeze or other incidental sounds). Type-2 SLMs are more affordable (often ~\$400 rather than ~\$9,000 for Type-1) but can have noise floors of ~35 dB and should therefore never be used to measure ambient noise or quiet sound sources (expected to be <35-40 dBA); some more expensive Type-2 meters have noise floors approaching 22 dBA and would therefore be more useful for measuring quiet sounds, but not ambient levels. Within a few decibels above the noise floor, the accuracy of Type-2 meters is typically only slightly lower than Type-1 meters. Type-3 SLMs have higher noise floors and lower accuracy and should not be used for measuring ambient or assessing compliance.

- *Additional SLM equipment:* Weather-proof case and external battery will allow sound level meters to be deployed over multiple days. A microphone windscreen (typically purchased or rented with the SLM) should be used for all outdoor measurements to reduce effects of wind-generated noise.
- *GPS receiver:* Accurate location data should be collected for each measurement location and all nearby noise sources. Location data will allow subsequent measurements to be taken from the same location, which is important for long-term data sets. Such data will also be important for validation of spatially-explicit models.
- *Rangefinder:* When making measurements of a noise source, such as a generator or compressor station, it is useful to know how far away from the source the measurement is taken. This information is necessary in order to estimate the noise level at the source, or to estimate the noise levels at other distances. This information is also needed to use the measurement as a source file for use in a noise propagation model (e.g. NMSimNORD or SoundPLAN).
- *Weather station* Proper documentation of meteorological conditions is critical to determine the accuracy and comparability of measurements. An anemometer, thermometer and hygrometer will provide the important wind speed/direction, temperature and humidity data, since all these measurements can influence noise levels. A portable weather station placed near the noise monitoring equipment will allow accurate, local data to be collected continuously; such data can be logged on some meters or by the weather station. Alternatively, weather data from a nearby weather station may be adequate for assessing the weather at a noise-monitoring site.
- *Recording equipment (optional):* Audio recordings of noise may be useful for monitoring intermittent noise sources or determining the identity of different noise sources at different time periods. Due to the difficulty of processing and analyzing what are often lengthy recordings, audio recording may not always be desirable; however, it may be useful in some cases when combined with more traditional noise monitoring methods. For example, if one was interested in measuring loud sound events during construction (e.g. using L_{max} or L_{10}), then it may be critical to exclude events caused by songbirds using the SLM microphone as a signing perch; by listening to an audio recording of the monitored period, one could identify and exclude these events from the SLM log. Alternatively, one could analyze the audio files to determine the relative contribution of

different noise sources to the overall noise levels in an area measured by an SLM (e.g. using L_{eq}) (Lynch et al. 2011). To collect audio data, Automatic Recording Units (ARUs), such as the commercially available SongMeter or ARUs developed by the Cornell Lab of Ornithology, may be deployed to a location to record over a designated time interval synchronous with the SLM recording periods. Some SLMs have splitters available (Larson Davis ADP015) so that noise from the SLM microphone can be recorded both by the SLM and an external audio recorder; alternatively, sounds can be recorded from the SLM output port (Lynch et al. 2011; Blickley & Patricelli 2012).

- *Traffic counters (optional)* Traffic on most roads varies with the day of the week and time of day. Axle counters (particularly if vehicle passes are time-stamped) allow noise measurements to be associated with traffic levels.

Placement of noise monitoring equipment:

Location

- *Leks:* Many current noise management strategies define maximum allowable noise level at lek edge (Patricelli et al. 2012). Implementation of such standards requires that ambient levels be measured on or near the lek. If measurements are made on or near a lek, measurements made while birds are present on the lek period (for approximately four hours after sunrise) should be excluded from ambient or noise level calculations as sage-grouse vocalizations are likely to be louder than all but the loudest and closest anthropogenic noise sources. If measurements were made during the lekking time, one can imagine a scenario where increasing development noise causes declines in lek attendance, which causes amplitude readings to decrease over time as fewer birds contribute to the sounds of the lek. Clearly, these data would tell us little about the actual noise levels of anthropogenic sources and could be very misleading. For this reason, it would be preferable to collect measurements prior to bird arrival (sunrise), prior to the lekking season and when temperature and wind profiles are generally similar as estimates of noise at lek edge during the lekking period. If measurements are made off-lek to avoid measuring the sound produced by grouse, they should be at an equivalent location with similar topography and relative distance to noise sources in the area. Recordings of the ambient noise may be useful for excluding periods when sage grouse or other species are vocalizing, which may substantially increase the measured ambient levels. Representative ambient baseline measurements made in undisturbed areas should be made at sites with vegetation and topography similar to the area of interest.
- *Noise sources-* The placement of microphones relative to a noise source will be determined by both acoustic properties of the noise and measurement goals. Typically one would want to be as close as possible to the source being measured, without being in the near field. Measurement errors that can result from hydrodynamic fluctuations very close to the source (within the hydrodynamic near field) and interference from sound waves that emanate from various parts of the noise source (in the geometric near field)(Bies & Hansen 2009). To avoid measurement errors associated with the near field, microphones should be placed at least one wavelength or two source widths away from the source (Mueller 2002). For example, if one were measuring noise from a compressor station that measured 50 meters wide, one would need to be a minimum of 100 meters from the station (here a rangefinder is very useful to choose a measurement location in the field). For most large infrastructure sources, a minimum distance of 100 meters will be adequate. Some stipulations or recommendations may also be relevant in determining the location of noise measurement. For example, noise management strategies may stipulate a maximum level of noise at the edge of a protected area, or at a particular distance from the noise source. If the goal is to develop a noise source file for a noise modeling program, such as NMSimNORD, then the program will specify the distance at which source measurements are to be made (for NMSimNORD, this is 1000 feet from the source). Ideally, measurements would be made at various points along a transect extending from the source. Transect measurements will allow propagation of the noise through the local environment to be estimated.

- For all noise and ambient measurements, surveyors should catalog the type and location of all nearby sources of anthropogenic noise.

Meter height

Noise levels can differ when measured near the ground or at the height of the human ear due to ground waves and propagation effects caused by vegetation. Therefore, most SLM instruction manuals suggest mounting meters or holding hand-held meters at approximately breast height to reduce ground effects. Average human ear height (1.2-1.5 meters) is also commonly used so that measurements approximate the noise heard by a human. When measuring noise levels for greater sage-grouse, we recommend placing meters at 12 inches above the ground, to approximate the height of a sage-grouse. However, if the goal of noise monitoring is to compare measurement to prior measurements collected at another height, then it would be preferable to match the height at which the previous measurements were made. Noise measurements made by meters with higher placement may be more relevant to many other species, so measurements taken at human ear or breast height may be more general. We have observed very small ($\ll 1$ dB) differences in measurements at different heights in the same locations, so meter height is unlikely to substantially affect the measured amplitudes at a given location.

Timing of measurements:

Noise levels can vary substantially depending on the time of day and season. Ambient levels can vary 10-15 dB between day and night due to differences in temperature, humidity, and activity of other species. Noise levels should be measured across a range of times and environmental conditions, and should focus on times of day and seasons when the focal species may be particularly sensitive. For sage-grouse, the most relevant measurements would be those collected during times when noise exposure is most likely to affect them— nights and mornings (i.e. 6 pm – 9 am). If noise output by anthropogenic sources is variable, noise measurements also should seek to characterize the range of noise produced and typical emissions throughout the day and night. For example, the noise produced by wind turbines may vary with wind speed and the vehicular traffic on a highway may vary with time of day or day of week. Measurements should be compared with measurements made at similar times of day, so meters should be deployed for a similar range of time for pre and post development measurements. Measurements should be taken for at least one hour at each site, ideally over multiple days with suitable climactic conditions.

Deployment

To characterize noise levels over the entire day and night, SLMs should be deployed to sites of interest for a minimum of 24 hours, and, preferably, 48-72 hours. For noise sources that are intermittent or irregular, longer deployments may be necessary in order to capture the full range of noise conditions. In order to ensure accurate measurements, individual locations should be measured on three separate occasions at least 1 week apart. Measurements should be made on days with good weather conditions (see *Weather*). Inclement weather over the measurement period may require further deployment.

Manual spot measurements

Manual measurements or short-term deployments of noise monitoring equipment of individual locations or noise sources may be used as part of long-term noise monitoring efforts, such as to ensure continued compliance with regulations. All relevant time, location, and weather data should be collected for such measurements. Timing of measurements should be coordinated to maximize the comparability with previously made measurements.

Weather:

The propagation of sound is heavily influenced by local environmental conditions and noise measurements in a single location can vary greatly due to differences in temperature, wind levels, snow cover, and other environmental factors. Environmental conditions should be measured throughout noise measurement periods so that measurements made during unsuitable (windy) conditions can be excluded.

Wind

Wind can affect noise measurements in several ways. Wind creates noise (e.g. rustling vegetation) and alters the propagation of noise from pre-existing sources in the local environment. In addition, wind can also create 'pseudonoise' by affecting the movement of wind and air across the microphone of the SLM; this pseudonoise is not a measure of audible noise caused by wind, it is only an artifact of wind shear across the microphone. This pseudonoise can be reduced at low wind levels with use of a microphone windscreen, which should always be used for outdoor measurements. Even with a wind screen, the accuracy of measurements is reduced in windy conditions. Therefore, when measuring loud sources, measurements made in wind greater than 11 mph should be excluded, since the noise and pseudonoise from the wind is likely to swamp the energy from the noise source of interest. For measurement of ambient noise levels, measurements should only be made under calm conditions (<2.2 mph). Accurate estimates of local wind speed from a local weather station will allow noise measurements made during these windy periods to be identified and excluded from subsequent analyses. Comparisons of ambient noise levels or noise output should be made only under comparable wind conditions (wind direction and wind speed) as direction and speed can affect measured levels. In order to compare measurements, wind levels for each measurement should be in the same wind class (Table 1) and, if they fall into the Upwind or Downwind classes, the wind speed should be within 2.2 mph (Caltrans & Jones and Stokes Consulting 2003).

Table 1: Wind class (adapted from Caltrans & Jones and Stokes Consulting 2003)

Wind class	Vector component of wind (mph)
Upwind	-2.2 to -11
Calm	-2.2 to 2.2
Downwind	2.2 to 11

Temperature and Humidity

Temperature and humidity can affect noise measurements, although to a lesser degree than wind. In general, for measurements to be comparable, they should be taken at temperatures within 14° C (25.2° F) of each other (Caltrans & Jones and Stokes Consulting 2003). Measurements should also be taken under similar humidity conditions, although there are no strict guidelines for equivalence. In general, measurements taken under extremely dry conditions should not be compared with those taken under humid conditions. Ground moisture and snow cover can influence the propagation of noise and should also be recorded.

Measurement of noise:

Decibels

The amplitude, or loudness, of a sound is typically measured in decibels (dB). The decibel scale is logarithmic and due to the logarithmic scale, small changes in decibel level can represent large changes in loudness. For humans, an increase of 3 dB results in a barely perceptible change in noise level, a 5 dB increase in noise level is a perceptible change and a 10 dB increase in noise level is a perceived doubling of noise level.

Frequency weighting:

Weighted decibel scales can be used to account for differences in hearing sensitivity across frequencies. If decibels are not weighted, the amplitude is averaged across all frequencies within the measurement range (for 'dBF' or 'dB flat', the frequency range is undefined; for 'dBZ' the range is defined as 10 Hz to 20 kHz). A-weighted decibels (dBA) are most commonly used for noise measurements. A-weighting (ANS S1.42-2001) is used to account for changes in level sensitivity as a function of frequency. In an effort to simulate the relative response of the human ear, A-weighting de-emphasizes the high (>6.3 kHz) and low (<1 kHz) frequencies, and emphasizes the frequencies in between. Unfortunately, there is no weighting specific to sage-grouse or other wildlife. Most birds, besides owls, have hearing capabilities similar or slightly worse than humans; therefore, some experts recommend that A-weighting may be a suitable if not ideal metric for studies of birds (Dooling and Popper 2007). Recent research on peafowl (Freeman, 2012) found that males and females were capable of detecting infrasound (<20 Hz). This suggests that the human-centric A weighting may not be appropriate for some species. Some researchers advocate for the development of new species-specific frequency weightings, but this requires detailed knowledge about the hearing ability of these species and such data do not exist for sage-grouse. Most noise regulations have limitations that are based upon a maximum A-weighted value and A-weighted measurements are the most commonly collected. C-weighting is more linear and is used to account for human perception of loud sounds (exceeding 100 dB). We recommend that measurements be collected in A-weighted decibels (dBA), and other frequency weightings (dBC and dBF) if possible. By collecting and reporting levels in at each 1/3 octave band (see below), future weightings that are more sage-grouse specific can later be applied.

Time averaging

Sound level meters can measure noise levels over a number of different time intervals: slow, fast, impulsive or peak (Table 2). These correspond to different settings on the SLM. Noise produced

by most industrial noise sources does not fluctuate rapidly, so a ‘slow’ time-interval setting is generally most appropriate for characterizing such noise. To describe individual noise events, such as vehicles passing by, a ‘fast’ time-interval setting is preferred. For explosive sounds, such as gunshots or noise from mining, the ‘impulsive’ setting is more appropriate.

Table 2: SLM time intervals

Averaging time	Duration of measurement
Slow	1 second
Fast	1/8 second
Impulsive	1/30 second
Peak	Instantaneous peak

Critical Metrics to characterize noise sources

- L_{50} is the median noise level—the level that is exceeded 50% of the time. This measure is collected over some time period (e.g. 1 hour, or from 6 pm to 9 am) with this period being broken down into much smaller intervals (typically 1 second); an L_{50} of 30 dBA would mean that half of the intervals measured were less than 30 dBA and half of them were greater than 30 dBA. This metric is preferable to using a measure of average noise over a longer interval, like L_{eq} or L_{avg} , since these average metrics are more heavily influenced by occasional loud events, such as those caused by a songbirds, insects, aircraft, wind gusts, etc. These intruding sounds will have no impact on the L_{50} , unless they are present more than 50% of the time.
- L_{90} is the noise level that is exceeded 90% of the time. L_{90} , also known as the residual noise level. As with the L_{50} , the L_{90} is collected over some time period with this period being broken down into much smaller intervals (typically 1 second); an L_{90} of 20 dBA would mean that 10% of the intervals measured were less than 20 dBA and 90% of them were greater than 20 dBA. Residual noise levels reflect background noise level at a site, since they exclude most intruding noise from birds, insects, wind gusts and sporadic anthropogenic noises (passing vehicles or aircraft) that raise the average (e.g. L_{eq}) and maximum values (e.g. L_{max} , L_{10}) over a measurement period. This metric is the most suited for estimating ambient values to set the baseline for management objectives. In an area with anthropogenic noise sources producing continuous noise (like most energy development infrastructure), the L_{90} measurement will not represent pre-development ambient values since the continuous noise source will contribute to the residual levels. To estimate predevelopment ambient for a disturbed site, measurements must be collected in a similar but undisturbed area, or estimated through modeling.
- L_{10} is the noise level that is exceeded 10% of the time and is a metric that characterizes the maximum noise level in an area. The L_{10} is collected over some time period with this period being broken down into much smaller intervals (typically 1 second); an L_{10} of 60

dBA would mean that 90% of the intervals measured were less than 60 dBA and 10% of them were greater than 60 dBA. As a measure of maximum noise level, the L_{10} measurement is less affected by the occurrence of a single loud noise event than the L_{max} (see below).

- L_{eq} is the equivalent continuous noise level and is calculated by integrating the energy in the sound over the entire measurement and dividing by the time period to determine the equivalent noise level if the noise were constant. The time period can range anywhere from one second to 24 hours. For noise sources with relatively continuous noise output, L_{eq} is commonly used as a descriptor. L_{eq} is influenced more by loud noise events, even if they are relatively brief, than by quieter noise events that are frequent. Thus, the L_{eq} metric may not be ideal for describing intermittent noise sources, such as traffic noise, where noise events are relatively quiet but frequent.
- L_{max} is the RMS (root-mean squared) maximum noise level integrated over a specified time interval and measured during a single noise event or specified time period. The L_{max} characterizes the maximum noise level, defined by the loudest single noise event.
- *1/3 Octave spectrums* are the sound level measurements obtained from a contiguous sequence of 1/3 octave spectral bands (typically ranging from 12.5 Hz to 20 kHz). 1/3 octave band levels can be used to construct noise spectra that show the relative power of different frequencies. 1/3 octave band measures can be used to calculate a number of other metrics, especially if they are collected continuously at short intervals. Measurements of the relative amplitude of the noise at different frequencies is important for calculating the potential of a noise source to mask sound relevant to the species of interest (e.g. Blickley and Patricelli, 2012).

Additional Useful Metrics

- *SEL* (Sound Exposure Level) is the total noise energy experienced during the whole of the noise event as if it had occurred evenly spread over a period of one second (equivalent to a one second L_{eq}). SEL relates to a single noise event and is designed to take account of both duration and loudness.
- *N-Level* (Number of events) is a count of the number of events that exceed that exceeds a maximum decibel level during a specified period of time. This metric may be particularly useful for characterizing intermittent noise sources such as roads.
- *TA* (Time above) is a measure of the percent of time that exceeds an indicated decibel level and may be useful for determining compliance with noise standards.
- *DNL* (Day-Night Average Sound level) is the average sound level measured over a 24-hour period with a 10 dB penalty for noise between 2200 and 0700. DNL is weighted to take into account the increased sensitivity to noise during nighttime hours. This is a noise level metric developed to characterize community noise and is the primary metric used by the FAA to characterize airplane noise.

Metrics to measure during noise monitoring:

Before deployment, the SLM units should be set to collect the following metrics: L_{eq} , L_{max} , L_{10} , L_{50} , L_{90} . High quality SLMs should also be able to collect additional metrics that may prove useful, including DNL, TA, SEL and N-level. If possible, the meter should log unweighted (dBF) 1/3-octave spectra of noise. Sample rates will also need to be set on logging SLMs; this is the interval over which measurements are collected and can vary from a fraction of a second to many hours. The ideal sample rate will depend on the goals of the monitoring project as well as logistical limitations. Ideally, one would collect data at 1-second intervals throughout the measurement period. This detailed time history would show how noise levels change over time in the sampling period and would be very useful in isolating the causes of change in noise levels (songbird singing versus vehicle passing by). However, collecting data every second would fill up the memory of the meter very quickly (the SLM manual will provide guidance in how to calculate how many hours can be recorded given the sample rate, the type of measurements collected and the amount of available memory). If it is difficult to regularly access the meter to download data, then it may be preferable to choose a longer sample interval and forgo some detail in the measurements. Hourly metrics are useful when focusing on a critical time window (e.g. 6 pm to 9 am). Each metric should be collected as A-weighted values (dBA), and if possible, as dBF (i.e. dB-flat or unweighted) and C-weighted (dBC) in each sample interval.

AUTHORS

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Dr. Gail L. Patricelli is an Associate Professor of Evolution and Ecology at the University of California, Davis. Dr. Patricelli studies bioacoustics, breeding behaviors and noise impacts in sage- grouse and songbirds. For the last seven years, Dr. Patricelli has been investigating the impacts of noise from natural gas development activities on greater sage-grouse lek attendance, stress levels and behaviors with graduate student Jessica Blickley and postdoctoral scholars Dr. Diane Blackwood, Dr. Stacie Hooper, and Dr. Alan Krakauer. Dr. Patricelli has published multiple peer-reviewed papers on noise impacts on wildlife and has served on Expert Panels to establish noise measurement protocols for the National Parks Service.

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Appendix A. Development area leks to be monitored in 2013

Complex Location	Lek Name
Mesa	Bloom Reservoir
	Cat
	Lovatt Draw Reservoir
	Lovatt West
	Mesa Road 3
	Mesa Spring
	Oil Road Fork
	Two Buttes
	Tyler Draw
Dukes Triangle	Big Fred
	Little Fred
	Lower Sand Springs Draw
Yellowpoint	Alkali Draw
	Prairie Dog
	Sand Draw Reservoir
	Shelter Cabin
	South Rocks
	Stud Horse Butte E.
	The Rocks

Pinedale Anticline Project Area Greater Sage-grouse Monitoring Area Complexes

