

<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved</i> <i>OMB No. 0704-0188</i>		
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. <b>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</b>					
<b>1. REPORT DATE (DD-MM-YYYY)</b> 10 Oct 2012		<b>2. REPORT TYPE</b> Consultative Letter		<b>3. DATES COVERED (From – To)</b> April 2012 – September 2012	
<b>4. TITLE AND SUBTITLE</b>  Acoustical Treatment Recommendations for Firing Range, Barksdale AFB, LA			<b>5a. CONTRACT NUMBER</b>		
			<b>5b. GRANT NUMBER</b>		
			<b>5c. PROGRAM ELEMENT NUMBER</b>		
<b>6. AUTHOR(S)</b> Wells, Andrew T. Jackson, Jerimiah M., TSgt, USAF Black, Jon E., Maj, BSC, USAF Sonntag, David M., Lt Col, BSC, USAF			<b>5d. PROJECT NUMBER</b>		
			<b>5e. TASK NUMBER</b>		
			<b>5f. WORK UNIT NUMBER</b>		
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> USAF School of Aerospace Medicine Department of Occupational and Environmental Health Risk Analysis Division 2510 Fifth St. Wright-Patterson AFB, OH 45433-7913			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  AFRL-SA-WP-CL-2012-0062		
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>			<b>10. SPONSORING/MONITOR'S ACRONYM(S)</b>		
			<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>		
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b>  Distribution Statement A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2012-5295, 10 Oct 2012					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> An acoustical assessment was performed on the firing range at Barksdale AFB, LA, in April of 2012, with findings provided in consultative letter AFRL-SA-WP-CL-2012-0058. This consultative letter provides acoustical treatment recommendations intended to decrease the firing range sound decay time such that it might become impulse rather than continuous noise.					
<b>15. SUBJECT TERMS</b> Impulse noise, impact noise, time delay, CATM, firing range, hearing, acoustics, noise, firearms					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b> Mr. Andrew T. Wells
<b>a. REPORT</b> U	<b>b. ABSTRACT</b> U	<b>c. THIS PAGE</b> U			<b>19b. TELEPHONE NUMBER (include area code)</b>
			SAR	4	



DEPARTMENT OF THE AIR FORCE  
USAF SCHOOL OF AEROSPACE MEDICINE (AFMC)  
WRIGHT-PATTERSON AFB OH

10 October 2012

MEMORANDUM FOR 2 AMDS/SGPB  
ATTN: MAJ CARL CHAMPION  
243 CURTISS RD  
BARKSDALE AFB, LA 71110-2425

FROM: USAFSAM/OEC  
2510 Fifth Street  
Wright-Patterson AFB OH 45433-7913

SUBJECT: Consultative Letter, AFRL-SA-WP-CL-2012-0062, Acoustical Treatment  
Recommendations for Firing Range, Barksdale AFB, LA

1. INTRODUCTION: On 24-26 January 2012, the Consultative Services Division of the United States Air Force School of Aerospace Medicine, at the request of 2 AMDS/SGPB, performed an acoustical assessment of the Combat Arms Training and Maintenance firing range facilities at Barksdale AFB, LA. A previous consultative letter, AFRL-SA-WP-CL-2012-0058, Acoustical Assessment of Firing Range, Barksdale AFB, LA, addressed the findings of this assessment. This letter addresses some acoustical treatment options.

2. POTENTIAL TREATMENTS: The following is a list of noise-absorbing material treatment options that will aid in reducing the Barksdale Combat Arms Training and Maintenance firing range noise decay time to an acceptable time to classify the range as impact versus continuous noise. Ideally, the Pyrok Acoustement 40 with a minimum 1 1/2" thickness acoustic treatment option should be considered first, as it is the most durable option for the environmental conditions of the range, as well as having a high noise reduction coefficient (NRC). The treatment options are listed in order of recommendation.

a. Pyrok Acoustement 40:

(1) Pros: This is the most durable option for the environmental conditions at Barksdale AFB. It can be vacuumed, brushed clean, and washed, and it is not combustible. It can be used in wet, humid conditions as well as installed on a ceiling, if needed.

(2) Cons: Cost and installation effort.

(3) Thickness and NRC:

Thickness	NRC
3/8"	0.35
1/2"	0.50
1"	0.60
1 1/2"	0.70
1 5/8"	0.75

(4) Contact: [www.pyrokinc.com](http://www.pyrokinc.com), howard@pyrok.com

b. Troy Sound Wall Systems (Troy Board with Troy Wool): Composite wood fiber-cement matrix board over high-density mineral wool.

(1) Pros: Claims high NRC and exterior use capability. Used on other AF ranges.

(2) Cons: Cost, installation effort, and concerns about durability of wood component in extreme weather.

(3) Thickness and NRC:

Thickness	NRC
1"	0.90
2"	1.0
3"	1.1

(4) Contact: [www.troyacoustics.com](http://www.troyacoustics.com), (800) 987-3306

c. Pinta Acoustic PHONSTOP™ Ceiling and Wall Tiles: Thin fiberglass mesh laminated to foam panels.

(1) Pros: Panels can be installed with adhesive. Manufacturer recommends for indoor or outdoor applications, including firing ranges, claiming resistance to impact, temperature, moisture, mold, pressure, and acid.

(2) Cons: Likely less durable than some options.

(3) NRC: Up to 1.05, depending on thickness.

(4) Contact: [www.pinta-acoustics.com](http://www.pinta-acoustics.com), (800) 662-0032

d. Silent Panel: Semi-rigid porous expanded polypropylene acoustical bead foam wall panels.

(1) Pros: Claims to be moisture resistant, easy to clean, easy to replace when damaged, Class A fire retardant, and commonly used on indoor firing ranges.

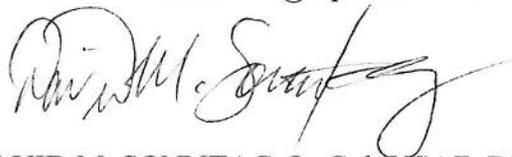
(2) Cons: Concerns about how well it would hold up in heavy rain and potential for mold growth.

(3) NRC: For a 2" panel installed with adhesive directly to the wall or ceiling, the NRC is 0.7. Due to concerns about moisture and safety, directly adhering to the wall would be the expected configuration, despite a potential increase in the NRC by slightly spacing the panel from the wall.

(4) Contact: [www.SoundproofingAmerica.com](http://www.SoundproofingAmerica.com), (877) 530-0139

e. Quilted fiberglass panels (available from many sources): This solution has already been attempted and deemed unsatisfactory. The panels absorbed far too much water during heavy rains. To avoid risk of ricochet, they were mounted using Velcro, and the additional weight of the absorbed water caused the panels to fall off the walls and, ultimately, fail to meet their intended use.

3. If there are questions concerning these recommendations, and for ongoing support, please contact Mr. Andrew Wells at DSN 798-3306 or via email at [andrew.wells@wpafb.af.mil](mailto:andrew.wells@wpafb.af.mil).



DAVID M. SONNTAG, Lt Col, USAF, BSC  
Chief, Consultative Services Division