



April 12, 2012

Mr. George Hyde  
Denton, Navarro, Rocha & Bernal, P.C.  
2517 N. Main Ave.  
San Antonio, Texas 78212  
Delivered electronically to george.hyde@rampage-aus.com

**Re: Evaluation of Range Safety Improvements of Firing Ranges  
Bracken Range and Rifle Club, San Antonio, Texas**

Dear Mr. Hyde,

**TRS RANGE SERVICES (TRS)** conducted an evaluation of the range safety improvements implemented at the Bracken Range and Rifle Club. These range safety improvements were implemented in response to claims that errant rounds potentially had left the shooting range property and impacted surrounding property. **TRS** did not conduct a site visit to inspect the constructed range safety improvements. **TRS'** evaluation of the range improvements are based on review of the following relevant documents provided by Denton, Navarro, Rocha & Bernal, P.C.

- Video: "City of Garden Ridge: Bracken Pistol & Rifle Range, Inspection on 10/12/2011"
- Michael Carter Deposition, file titled Carter Depo Ex 1.pdf
- Michael Carter Deposition, file titled Carter Depo Ex 2.pdf
- Michael Carter Deposition, file titled Carter Depo Ex 3.pdf
- Michael Carter Deposition, file titled Carter Depo Ex 4.pdf
- File titled "Complete Copy of 2-22-12 email enclosures.pdf"
- Michael Carter Oral Deposition file titled "Michael Carter 030212-mini.pdf"
- Transcript of Lynn Wilson, taken 1-9-2012.pdf
- Transcript of Thomas Wilson, taken 1-9-2012.pdf

Texas State Law, Subchapter D, Outdoor Shooting Ranges, Sec. 756.042, Construction Standards, states "The owner of an outdoor shooting range shall construct and maintain the range according to standards that are at least as stringent as the standards printed in the National Rifle Association range manual." Based on this standard, **TRS** evaluated the range safety improvements with respect to their compliance with the range construction standards set forth in the National Rifle Association's Range Source Book (NRA Range Source Book) (National Rifle Association Range Department, 2004). The following comments are based on **TRS'** evaluation of the standards and range safety improvements.

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<b>Range Evaluation Summary Table</b>		
<b>Issue</b>	<b>Range Sourcebook Reference</b>	<b>TRS Comment</b>
<b>General Range Design</b>		
Baffle design not reviewed by an experienced Engineer	Article 2: Disclaimer, Section 2.01.1 pg I-4; Article 2: Disclaimer, Section 2.01.2	Baffle design should be reviewed by an experienced design professional
<b>CHL Range</b>		
Baffle angle of protection is 18 degrees above normal firing angle.	NRA Source Book Drawing Sheet "Outdoor Pistol Range – Plan and Section (pg 516).	NRA documents show vertical protection up to 90 degrees above normal firing angle
Verify baffle heights		Verify actual baffle heights to confirm 18 degrees of protection from sequential baffles. See Figure 1.
Single baffle is not capable of stopping a typical round used at the range	Section Two, Chapter Two, Section 2.06.1.1; Drawing Sheet "Outdoor Pistol Range – Plan and Section	Using two baffles in sequence to stop a round is not consistent with the NRA Range Source Book guidelines
<b>Pistol Range Upgrades</b>		
Covered firing area does not provide bullet resistant material on the roof of the structure	Drawing Sheet "Wood Covered Firing Line Concrete Baffle" (pg 536)	Corrugated metal used on the roof of the covered firing line is not sufficient to meet the NRA Range Source book guidelines. TRS would need to inspect the material installed to confirm that it does not meet the 10 gauge guideline.
Berm height less than the NRA Range Source Book recommended 20 feet.	Article 3: Technical Specifications, Section 3.01.3.4.1	Berm height needs to be evaluated to confirm that it provides adequate containment to protect surrounding land uses from errant rounds.

## GENERAL DESIGN EVALUATION

NRA Range Source Book Article 2: Disclaimer, Section 2.01.1 pg I-4 states "this Source Book is in no way to be used as a substitute for, or in lieu of, consultation with architects, engineers and attorneys who should be called upon to make specific recommendations for individual range design, construction and use of shooting ranges". Furthermore, Section 2.01.2 of the same Article: Disclaimer states that "In order to build and operate a safe shooting range, the plans, specifications and construction of said range require the thorough professional evaluation, guidance and services of professional engineers and architects" (National Rifle Association Range Department, 2004). **TRS'** understanding of the NRA Range Source Book disclaimers is that any range design should be reviewed and approved by an appropriately licensed engineer or architect.

The following exchange is documented within the oral deposition of Mr. Michael Carter, the designer of the range safety upgrades (page 35, lines 6 – 12). Mr. Carter is specifically asked: "The design for the baffle system that was installed at Bracken Rifle Range, was that reviewed by an engineer?" Mr. Carter replies "Not that I am aware of." His response is the same when asked if the design was reviewed by an architect. Based on these responses, it appears that Mr. Carter's range designs are not in compliance with the guidelines set forth in the NRA Range Source Book.

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Additionally, Mr. Carter indicates that he has no prior experience designing baffles before the baffles designed for the Bracken Range (oral deposition of Mr. Michael Carter, pages 34 and 35). It does not appear that Mr. Carter has a degree in engineering or architecture based on the discussion of his qualifications in his oral deposition.

Therefore, **TRS** submits that the design of the installed baffles at the Bracken Range does not meet the NRA Guidelines. **TRS** recommends that a thorough design review be conducted by a licensed, professional structural engineer and by a range construction expert experienced with the design of baffles to determine the operational functionality of the design.

**TRS** provides the following specific comments on each of the range upgrades.

### **CHL RANGE UPGRADES EVALUATION**

The CHL Range is a 15 yard firing range used for tactical training. Upgrades for the CHL Range included the installation of 5 baffles in sequence. Baffles are intended to stop rounds accidentally fired at an angle above the normal position of fire used to fire a round and hit a target. The baffle system should be arranged to contain rounds fired from various distances from the target line.

Baffle tests, performed by Mr. Carter, indicate that pistol rounds are capable of penetrating a single baffle, but do not penetrate multiple baffles lined up sequentially along the direction of fire. Therefore a round must come into contact with two baffles sequentially in order to adequately contain a round fired at the range.

Mr. Carter states "These baffles will provide a vertical protection of approximately 18 degrees of two baffle coverage and single baffle coverage above that varying up to 26 degrees to 70 degrees depending on the location of the shooter within the firing deck surface" (Page 1 of the Complete Copy of 2-22-12 email enclosures.pdf document). Given the baffle layout and design requirement that two baffles must be contacted to stop a round, **TRS** believes that this is inadequate to meet the guidelines set forth in the NRA Source Book. NRA Source Book Drawing Sheet "Outdoor Pistol Range – Plan and Section" shows a baffle configuration that provides vertical round containment up to 90° (National Rifle Association Range Department, 2004) (Page 516).

For clarification purposes, the upgraded baffle layout is graphically shown in Figure 1 as a 45° angled baffle at the 15 yard line; vertical baffles at the 10 yard, 5 yard, and target lines; and an additional baffle sitting at the top of the earthen berm behind the target line (based on Carter Depo Ex 1.pdf, page 11). Since no specific measurements were provided or taken, **TRS** would require elevations, heights and dimensions to further evaluate if the baffle layout is adequate.

Additionally, according to The Range Source Book, Section Two, Chapter Two, Section 2.06.1.1 the general specification for overhead baffles is that they "(1) must be impenetrable for calibers used on the facility" (National Rifle Association Range Department, 2004) (Page 155). Further, NRA design drawings, noted above, graphically depict a single baffle stopping the round not two consecutive baffles as Mr. Carter suggests. Based on Mr. Carter's baffle test results a single baffle, as constructed at the range, is not impenetrable when typical rounds used at the range are fired into them. This is inconsistent with the recommendations in the NRA Range Source Book. Also, the use of two consecutive baffles to stop a round is inconsistent with guidelines in the NRA Range Source Book.

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## PISTOL RANGE UPGRADES EVALUATION

**TRS** observed that no baffles have been added to the pistol range upon video inspection of the pistol range. Video evidence suggests that rubber panels were added within the stalls and that an additional layer of corrugated steel was added over the top of existing corrugated steel on the outside of the covered shooting area.

The NRA Source Book Drawing Sheet "Wood Covered Firing Line Concrete Baffle" shows 10- gauge sheet steel fastened to the firing cover trusses over the firing position (National Rifle Association Range Department, 2004) (Page 536). **TRS** would require additional information on the type of corrugated steel to determine if it meets the 10 gauge requirement.

No additional baffles have been added to the pistol range. The existing baffle wall that sets at the top of the primary impact berm is a single layer of plywood and is not capable of stopping a round. Given this configuration **TRS** does not believe that the pistol range offers any protection for rounds fired vertically above the top of the existing berm located behind the target area.. Article 3: Technical Specifications, Section 3.01.3.4.1 of the NRA Range Source Book states, "In flat open country, backstop height of 20 feet is recommended..." (National Rifle Association Range Department, 2004). While the NRA guidelines recommend 20 feet for a typical backstop, it is offered only as a guideline that should take into consideration the surrounding topography and proximity to urban areas. Given that the berm is less than the recommended 20 feet, and in close proximity to a residential area, a topographical survey and analysis should be conducted to determine if the berm height is adequate for this range.

### Bibliography

National Rifle Association Range Department. (2004). *NRA, The Range Source Book, A Guide to Planning and Construction*. Fairfax, VA: National Rifle Association.

If you have any additional questions or need further information please contact me at 951-314-3121.

Sincerely,



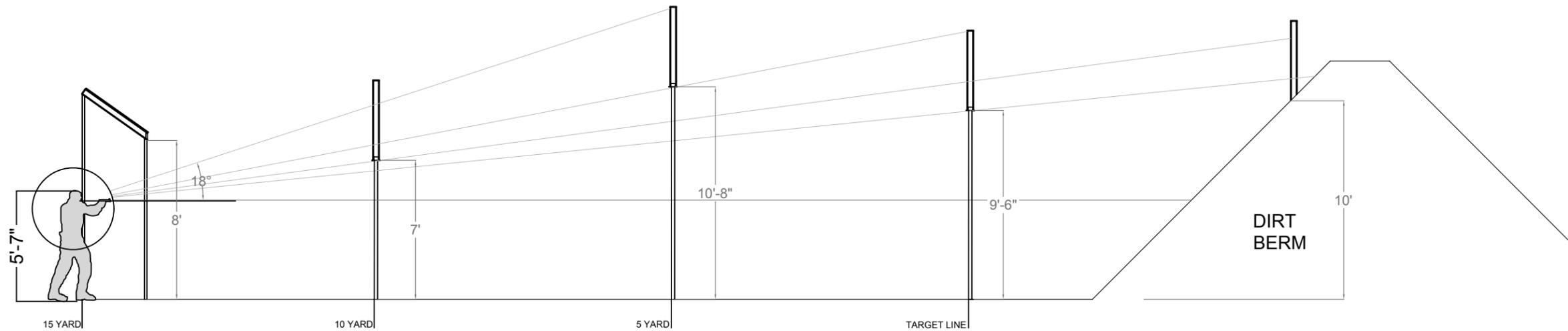
Kerry O'Neal  
**TRS RANGE SERVICES, LLC**

Attachment – Figure 1

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\*Note: The height of the baffles shown here are assumed based on the claim that the baffles provide 18° of protection with rounds passing through 2 baffles. TRS has no plans or field measurements to support the baffle heights shown here. Baffle heights should be field verified to substantiate the protective claims of the baffle installer.

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**Bracken Pistol & Rifle Range**  
 Garden Ridge, TX

**Assumed Baffle Layout**

REVISIONS	
1	
2	
3	
4	

PROJECT:

DATE: 4-2012

SCALE:

DRAWN BY:

SHEET NUMBER

1